



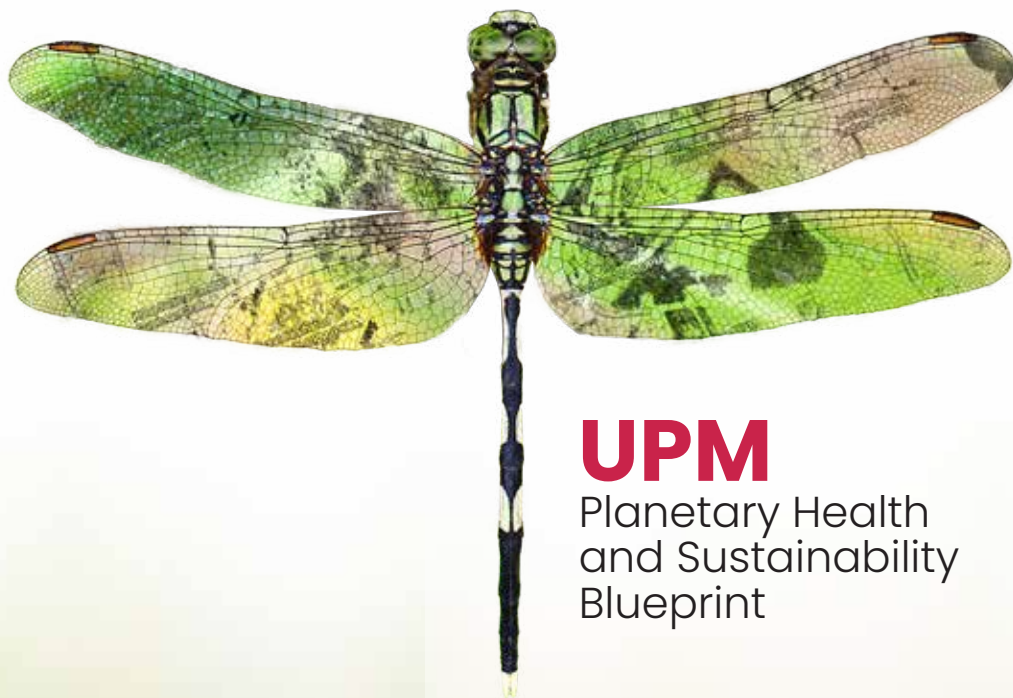
UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERSAKTI

PUTRA
PERTANIAN UNTUK RAKYAT



UPM

Planetary Health
and Sustainability
Blueprint



UPM

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and Sustainability
Blueprint



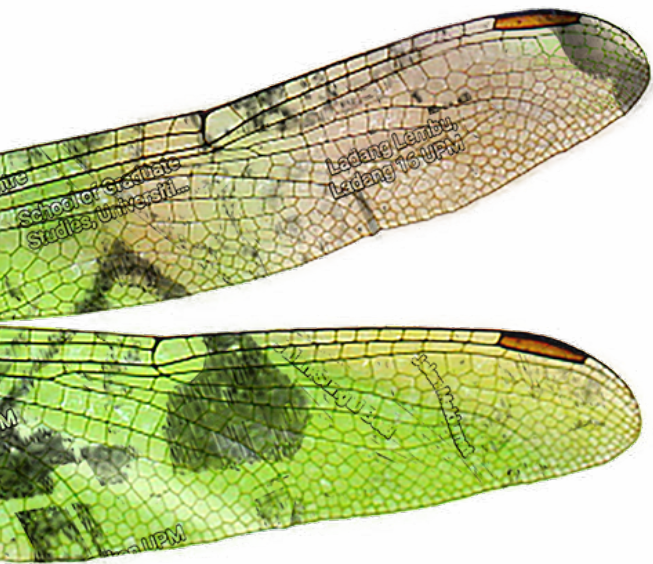
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The dragonfly (pepatung) is the symbol of UPM's Planetary Health and Sustainability Blueprint. As a bio-indicator of clean water and healthy ecosystems, it links aquatic and terrestrial environments, reminding us that planetary health depends on the vitality of all ecosystems. Its 360-degree vision represents seeing issues from multiple perspectives, while its four independently moving wings symbolise how diversity, working together, creates strength. The dragonfly captures what UPM aspires to be: aware, adaptive, and collaborative in addressing planetary challenges.

Concept Rationale

The concept for this book draws upon the image of a dragonfly as a symbol of transformation, ecosystem balance, and sustainability. It is inspired by *Orthetrum sabina*, a species of dragonfly found at the Sultan Idris Shah Forestry Education Center (SISFEC).

The life cycle of the dragonfly, which is closely connected to water, air, and land, reflects the concept of Planetary Health and highlights the relationship between nature and human well-being.

The dragonfly wings, which feature a sketched map of UPM and network patterns, symbolise global responsibility and the interconnectedness of ecological, social, and economic systems. There is also a vector illustration of a globe that conveys UPM's seriousness in contributing to Planetary Health.

The green background represents the foundation of natural resources, giving meaning to the three natural elements: land, water, and plants.

The minimalist design further emphasises a strategic and focused approach to UPM's sustainability agenda.

From a branding perspective, a clear and uncluttered design improves clarity, while a timeless visual strengthens recognition by making the message more memorable.

Acknowledgement

UPM extends its sincere appreciation to all individuals, units, partners, and stakeholders whose collective expertise, commitment, and collaboration contributed to the development and refinement of this blueprint.

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Foreword

Vice Chancellor

Universiti Putra Malaysia (UPM) is firmly committed to advancing Planetary Health and Sustainability as a core institutional responsibility, aligned with national priorities and global aspirations. The interdependence between human well-being, environmental integrity, and sustainable development demands decisive, science-based, and collaborative action from institutions of higher learning.

The UPM Planetary Health and Sustainability Blueprint provides a strategic, integrated framework to guide the University's efforts to embed sustainability across governance, education, research, innovation, campus operations, and community engagement. This Blueprint reflects UPM's strengths as a research-intensive university and translates knowledge into meaningful impact for society, ecosystems, and future generations.

Through this Blueprint, UPM reaffirms its role as a catalyst for transformative change, championing responsible stewardship of natural resources, fostering interdisciplinary solutions, and nurturing graduates who are ethical, resilient, and globally minded. The initiatives outlined herein are designed to be inclusive, measurable, and adaptive, ensuring continuous improvement and long-term relevance.

I commend the dedication of all stakeholders involved in developing this Blueprint. May it serve as a shared compass that unites our collective efforts towards a healthier planet and a more sustainable future.

DATO' PROF. IR DR. AHMAD FARHAN MOHD SADULLAH
Vice-Chancellor
Universiti Putra Malaysia



Foreword

Deputy Vice Chancellor

(Industry and Community Relations)

The UPM Planetary Health and Sustainability Blueprint reflects the University's strong commitment to translating knowledge into action through meaningful engagement with industry, communities, and strategic partners. As global challenges related to climate change, food security, and environmental degradation intensify, universities must play a pivotal role beyond academia serving as connectors, enablers, and solution providers.

This Blueprint provides a clear pathway for strengthening industry collaboration, community empowerment, and knowledge exchange, ensuring that sustainability initiatives generate tangible social, economic, and environmental impact. By leveraging partnerships and co-creation approaches, UPM aims to scale innovations, foster inclusive development, and support resilient communities in line with the principles of planetary health.

The initiatives outlined emphasise collaboration across sectors, capacity building, and shared responsibility, reinforcing UPM's position as a trusted partner at local, national, and global levels. Through strategic engagement, UPM will continue to bridge research and practice while nurturing sustainable livelihoods and responsible industries.

I extend my appreciation to all contributors involved in the development of this Blueprint. May it guide our collective efforts in strengthening partnerships and advancing sustainability for the benefit of society and the planet.

PROFESOR DR. SHAMSUL BAHRI HJ. MD TAMRIN

Deputy Vice Chancellor (Industry and Community Relations)

Chairman, Planetary Health and Sustainability Taskforce Committee

Universiti Putra Malaysia





#WeLoveUPM



CHAPTER 1 INTRODUCTION



Introduction

UPM's planetary health and sustainability journey is grounded in its agricultural heritage, research strength and responsibility to serve society and the planet.

Institutional Foundations

- Agricultural and land stewardship heritage
- Multidisciplinary academic ecosystem
- Research university status and RDICE strength
- Campuses, farms, forests and living laboratories
- Community, industry and global engagement

Strategic Context

- Integrate planetary health into UPM's sustainability agenda
- Align with UPM True North, national policy and global sustainability priorities
- Strengthen governance, data, reporting and institutional coordination



Universiti Putra Malaysia (UPM, formerly known as Universiti Pertanian Malaysia) was established in 1971, as a result of the merger of the Faculty of Agriculture of the University of Malaya and the Malaya Serdang Agricultural College. The university began with three faculties, namely the Faculty of Agriculture, the Faculty of Forestry and the Faculty of Veterinary Medicine and Animal Science. The renaming of the university from Universiti Pertanian Malaysia to Universiti Putra Malaysia in 1997 is meant to reflect its broadened disciplinary scope, which has now expanded to agribiotech and environment; engineering and technology; business, economic and social sciences; and health, food and life sciences. As of 2026, UPM has 15 faculties, 11 institutes and 2 schools, offering 10 diploma programmes, 81 bachelor programmes, 75 Masters programmes by coursework and more than 300 fields of study in Master and Doctoral programmes by research.

UPM established its presence in Sarawak on 10 August 1974 at the Natural Resources Training Centre in Semenggok, Kuching, reflecting its early commitment to agricultural and natural resource education in East Malaysia. Initially offering diploma and pre-diploma programmes, the campus relocated to Bintulu in June 1987 and was formally designated as a branch campus later that year. On 30 June 2025, it was officially renamed as Universiti Putra Malaysia Sarawak (UPMS).

In 2006, UPM was designated a Research University by the Malaysian government, strengthening its research capacity, institutional autonomy, and leadership role in high-impact scholarship. UPM has since enhanced its national and global standing, achieving a position of 134th worldwide in the 2026 QS World University Rankings. Its sustained excellence in rankings, research output, innovation, and industry engagement underscores UPM's role in advancing knowledge, delivering societal impact, and contributing to national and global development.

Sustainability at Universiti Putra Malaysia

Blessed with a vast land area of approximately 3,000 hectares, including 714.178 hectares across UPM Serdang and UPM Sarawak, UPM's sustainability journey is deeply rooted in its origins as an agricultural institution. Early priorities in education and research focused on food security, land stewardship, and community well-being. As the university evolved into a multidisciplinary research institution, these foundations expanded into broader commitments to environmental responsibility and societal impact. Over the decades, sustainability has been progressively embedded across academic programmes, research institutes, and community engagement initiatives. This trajectory was strengthened with the establishment of the Sustainability and Green Section in 2022, which coordinates green campus initiatives, resource management, and SDG-linked community programmes, now implemented at scale annually.



UPM's sustainability efforts have accelerated in recent years, reflected in improved global sustainability rankings and greater visibility in green campus management, research output, and interdisciplinary collaboration. At the same time, internal workshops and taskforce deliberations have surfaced persistent challenges, including fragmented data systems, underreporting, and the need for stronger governance. These discussions catalysed the integration of planetary health into UPM's sustainability agenda, recognising the inseparability of human well-being and ecological stability. This direction is reinforced by national policy frameworks, notably the National Planetary Health Action Plan and the Malaysia Higher Education Blueprint 2026–2035, which position planetary health and sustainability as strategic priorities for higher education.

Within this context, UPM Strategic Plan 2026–2030 and the True North Framework provide a clear institutional anchor, embedding sustainability as a core value supported by commitments to good governance, talent development, financial resilience, and a conducive campus environment.



UPM Campuses and Outreach Sites

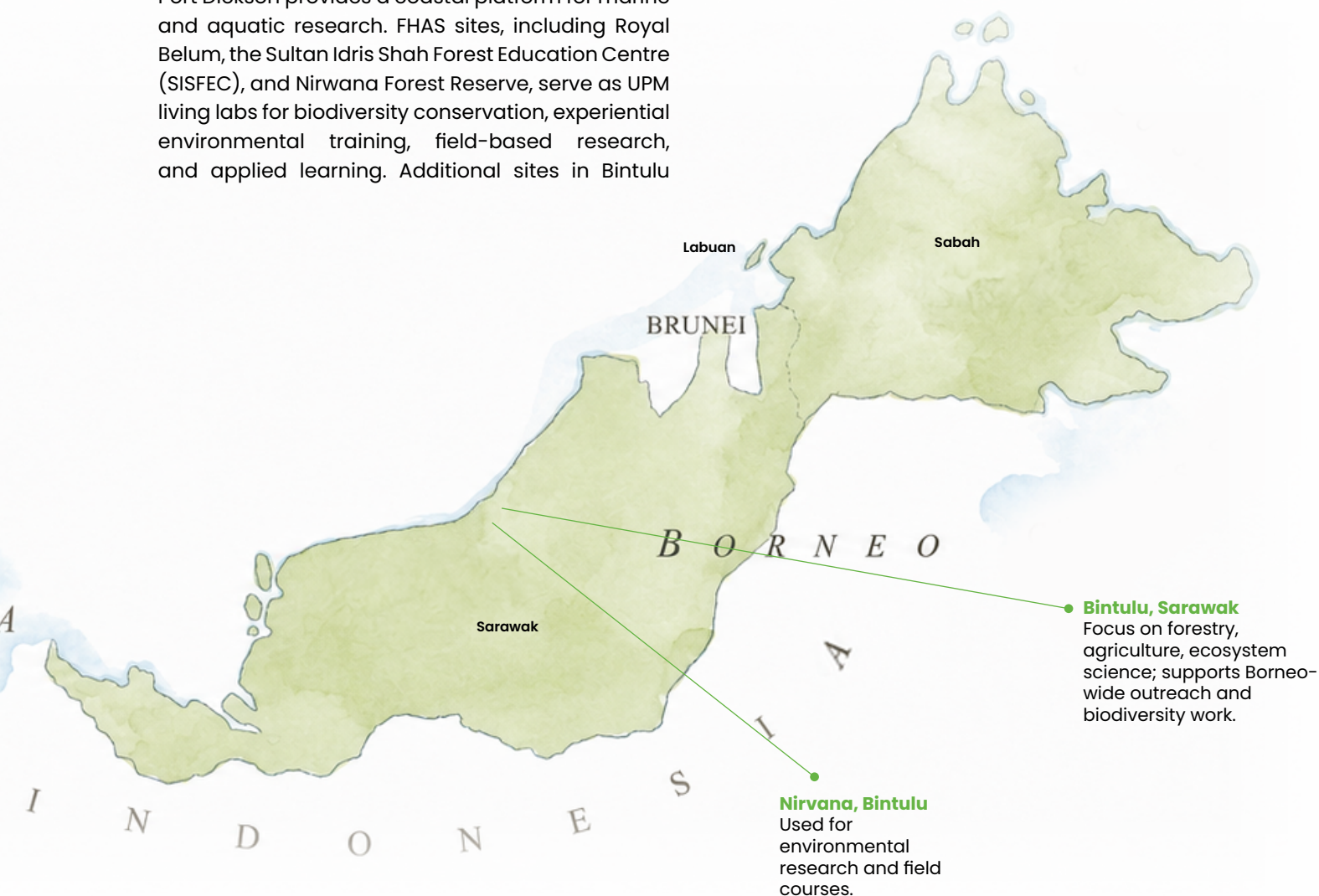
UPM's main campus in Serdang serves as the central hub for the university's academic, research, and administrative functions. Strategically located within the Klang Valley, its expansive landscape integrates faculties, research institutes, experimental farms, and forested areas, supporting a wide range of sustainability and planetary health initiatives. The campus functions as a core living laboratory for teaching, research, and community engagement.



The Bintulu Campus in Sarawak extends UPM's footprint into a biodiversity-rich region, creating strong opportunities in forestry, agriculture, and ecosystem science. It enhances UPM's presence in East Malaysia while strengthening engagement with rural and indigenous communities through applied research and field-based learning.

UPM's broader network expands its ecological and disciplinary reach. The International Institute of Aquaculture and Aquatic Sciences (I-AQUAS) in Port Dickson provides a coastal platform for marine and aquatic research. FHAS sites, including Royal Belum, the Sultan Idris Shah Forest Education Centre (SISFEC), and Nirwana Forest Reserve, serve as UPM living labs for biodiversity conservation, experiential environmental training, field-based research, and applied learning. Additional sites in Bintulu

and Kuching strengthen regional partnerships in veterinary and environmental sciences, while the UPM China Super Satellite Centre in Fuzhou supports international research collaboration. Together with highland and conservation sites in Genting Highlands, Semenyih, and Fraser's Hill, these facilities form an interconnected system of living laboratories that reinforces UPM's leadership in planetary health and sustainability.



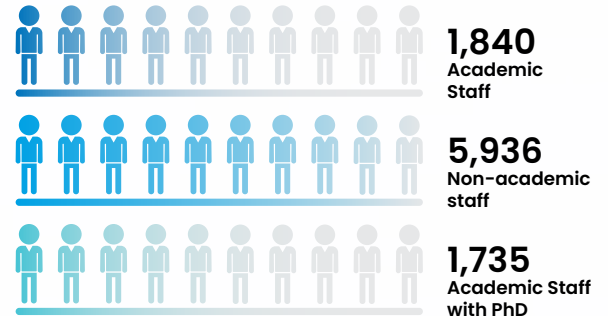


UPM Citizen and Population

As of December 2025, UPM's population reflects a diverse and dynamic academic community that underpins the university's teaching, research, and societal mission. The university comprises of approximately 2,000 academic staff, 1,700 PhD holders, underscoring its strong research capacity and disciplinary depth. They are supported by around 5,000 non-academic staff who ensure the effective operation of faculties, institutes, and centres.

UPM's student community totals to around 30,000 individuals from Malaysia and more than 80 countries. This includes of around 18,000 undergraduates and 12,000 postgraduates, reflecting UPM's dual role as a national talent provider and a globally engaged research university. Collectively, UPM's citizens form a robust ecosystem supporting the university's aspirations in sustainability, planetary health, and global engagement.

7,100+ Staff



30,703+ Student

Approximately 30,720 student population comprises both local and international students from more than 75 countries around the world.



18,487
Undergraduate
students



12,216
Postgraduate
students

Student Mobility Programmes



3,269
Inbound
Student



1,821
Outbound
Student

**as of December 2025*





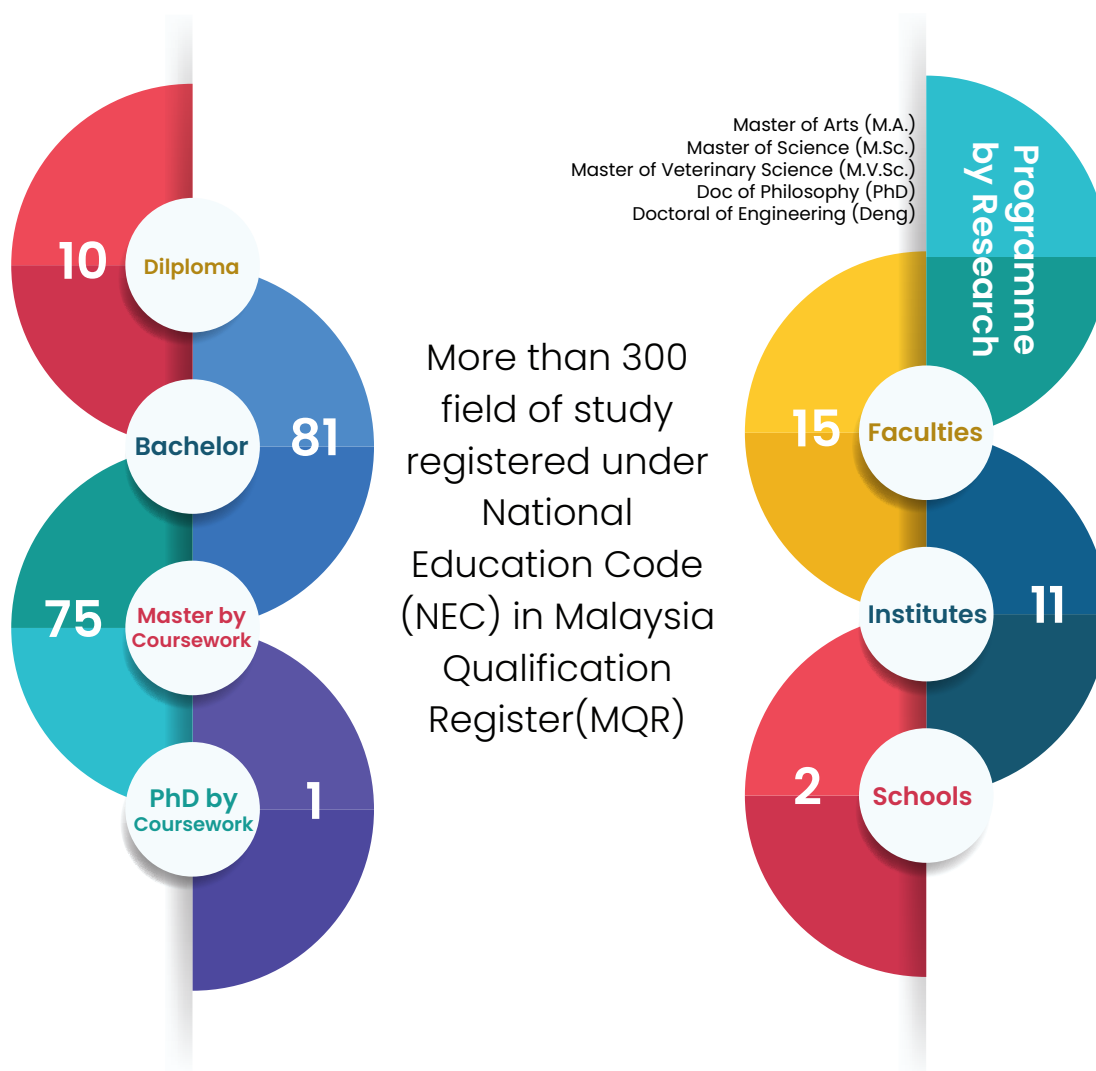
Academic Structure: Faculties, Schools, and Undergraduate Programmes

UPM's academic ecosystem is organised around a comprehensive network of faculties and schools spanning the agricultural, scientific, technological, environmental, social science, humanities, and medical domains. This structure reflects the university's evolution from an agriculture-focused institution into a multidisciplinary research university where sustainability and planetary health are potentially integrated as organising principles rather than peripheral themes. Across faculties, undergraduate programmes are designed to integrate ecological stewardship, human well-being, and responsible development, aligning closely with UPM's mandate to address complex socio-environmental challenges.

The breadth of disciplines creates a rich landscape of interconnected knowledge systems that enables holistic education and transdisciplinary research. This integration allows planetary health perspectives to be embedded across teaching, research, and community engagement, linking environmental integrity with social and economic outcomes. Collectively, these faculties and schools form a robust academic foundation that positions UPM as a national and global leader in advancing planetary health and sustainability.



Faculties, Schools & Institutes



3 Higher Education Centre of Excellence (HICoE)

- Institute of Bioscience (IBS)
- Institute of Tropical Forestry and Forest Products (INTROP)
- Institute of Tropical Agriculture and Food Security (ITAFoS)

Foundation

The Centre of Foundation Studies In Science
Universiti Putra Malaysia (ASPutra)



Research, Development, Innovation, Commercialisation, and Entrepreneurship (RDICE)

RDICE represents UPM's integrated knowledge-to-impact ecosystem, strategically oriented to advance sustainability and planetary health. Research forms a core pillar in sustaining UPM's role as a comprehensive research university, ranging from domains such as food security, ecosystem and biodiversity health. Supported by its extensive network of faculties and research institutes, UPM secures competitive funding from national ministries and grant schemes, complemented by industry-linked research and consultancy that are aligned with planetary health and sustainability agendas.

At the same time, internal reflections identified structural challenges that influence the effectiveness of RDICE, including fragmented reporting systems, unclear data ownership, under-documentation of outputs, and limited cross-faculty coordination. These issues affect the visibility and competitiveness of sustainability- and planetary health-related research, particularly for large-scale and interdisciplinary grants. Addressing these gaps is therefore critical to strengthening

coherence, demonstrating impact, and enhancing UPM's ability to position its research within national policy directions, the university's True North, and global sustainability priorities.

UPM's publication, citation, and innovation performance reflects the strength of its RDICE ecosystem and its contribution to planetary health and sustainability scholarship. High-impact publications across science and engineering, social sciences, arts and humanities, and design and architecture reinforce UPM's influence in informing policy and practices beyond academia. This knowledge base is further translated through a robust intellectual property and start-up ecosystem that generates solutions in agri-tech, green engineering, biomedical innovation, and environmental monitoring. Collectively, RDICE functions as a key institutional engine that integrates research, innovation, and enterprise to generate measurable environmental, social, and economic impact, reinforcing UPM's leadership in sustainability and planetary health.





Community and Industry Outreach

UPM has cultivated a sustained culture of engagement with communities and industry as a central dimension of its contribution to national well-being and sustainable development. In the recent reporting period, the university implemented more than 2,500 community-linked initiatives, including agricultural extension, circular economy practices, and health-related interventions, strengthening local livelihoods and supporting environmental restoration across urban, rural, and indigenous contexts. Complementing these efforts, strategic industry collaborations advance applied research, technology transfer, talent development, and innovation. Through structured partnerships with corporate and public sector actors, UPM has translated research into intellectual property, start-up ventures, and scalable technological solutions.

Together, these engagements integrate societal outreach with innovation ecosystems, reinforcing the university's role in delivering tangible social, environmental, and economic impact.

Together, community and industry engagement provide a critical bridge between knowledge generation and real-world application. By integrating research, innovation, and partnership-based action, UPM is able to translate planetary health and sustainability principles into practical interventions that deliver social, environmental, and economic values. This integrated engagement model strengthens UPM's capacity to co-create solutions, scale impact beyond the campus, and reinforce its leadership role in advancing planetary health and sustainability at national and regional levels.



Campus Environment

UPM's campus environment is shaped by a rich ecological and infrastructural landscape that underpins its identity as a sustainable, research-intensive university and directly supports planetary health. Extensive green coverage functions as both ecological capital and living laboratories for biodiversity research, environmental monitoring, and sustainability education. These landscapes strengthen ecosystem services on campus while embedding nature-based learning into teaching and research.

The university's energy systems further reinforce this sustainability orientation. UPM operates a combination of conventional energy supply alongside expanding solar photovoltaic installations, complemented by energy efficient lighting, smart building applications, and conservation initiatives aimed at reducing carbon

intensity. These measures contribute to improved resource efficiency, lower operational emissions, and greater institutional resilience. Through ongoing optimisation of energy use and gradual integration of renewable sources, UPM strengthens its commitment to planetary health within the scope of its existing infrastructure and operational capacities.

Campus mobility and waste management are integral to UPM's sustainability transition. Pedestrian networks, bicycle lanes, shuttle services, and access to public transport promote low-carbon mobility, complemented by efforts to encourage micro-mobility. Waste management encompasses multiple waste streams, including recyclable and hazardous materials, with ongoing efforts to improve segregation, monitoring, and institutional coordination. These initiatives highlight both progress and challenges in embedding circular practices across campus operations.

UPM's built environment, farms, and digital infrastructure complete this integrated ecosystem. A diverse portfolio of academic, research, residential, and support buildings provides opportunities for greener construction and energy-efficient management. Extensive farms, plantations, aquaculture facilities, and industry-linked collaborations offer large-scale platforms for research, innovation, and experiential learning in food security and ecosystem health. Anchored by Perpustakaan Sultan Abdul Samad as the custodian of institutional knowledge, and supported by UPM's digital infrastructure, UPM ensures sustained access to scholarly resources, data systems, and technological platforms essential for advancing sustainability and planetary health. The library safeguards, curates, and disseminates knowledge assets that underpin teaching, research, and evidence informed governance, while integrated digital systems enhance connectivity, data management, and institutional coordination. These knowledge and digital ecosystems strengthen UPM's capacity to support informed decision making and innovation in sustainability practice.

CATEGORY	DESCRIPTION
 GREEN COVERAGE	Forested areas, plantations, street plantings, experimental plots; supports biodiversity, research, and ecological health. 
 ENERGY	Mixed electrical supply with growing solar PV installations; energy-saving systems and conservation initiatives; smart facility management. 
 WATER	Natural lakes, ponds, waterways, and engineered supply systems; monitored consumption; conservation and restoration initiatives. 
 CONNECTIVITY & ACCESSIBILITY	Pedestrian networks, bicycle lanes, shuttle buses, parking facilities, links to public transportation; micro-mobility initiatives. 
 WASTE MANAGEMENT	Systems for organic, inorganic, recyclable, toxic, and hazardous waste; ongoing improvements in segregation and coordination. 
 BUILDINGS	Diverse portfolio of academic, research, administrative, residential, and sports facilities; varying floor areas and levels. 
 FARM & PLANTATION	Crop plantations, aquaculture facilities, livestock units, FarmFresh@UPM; supports agriculture, food security, and sustainability research. 
 LIBRARY & INFRASTRUCTURE	PSAS library collections and digital services; iDEC infrastructure for campus ICT, networks, data systems, and enterprise platforms. 





Social Health and Well-Being

UPM advances planetary health through an integrated social and health ecosystem that safeguards human well-being within a supportive and sustainable environment. The university fosters an inclusive campus culture that prioritises physical health, mental resilience, safety, equity, and a sense of belonging among students, staff, and surrounding communities. Physical wellness is strengthened through sports and recreational programmes coordinated by Akademi Sukan, while psychosocial support is provided by Bahagian Kaunseling UPM through structured counselling services and peer support frameworks.

Religious and spiritual well-being are supported through facilities such as the campus mosque and church. Pusat Islam UPM provides structured religious services, guidance, and community programmes specifically for Islamic affairs. Malaysian Research Institute on Ageing (MyAgeing) further contributes through gerontological research and community-based services that address ageing, intergenerational well-being, and healthy longevity. Together with student development initiatives, these institutional mechanisms contribute to holistic personal growth alongside academic excellence, reinforcing a healthy and resilient campus community.

The health infrastructure is anchored by *Pusat Kesihatan Universiti*, which delivers primary healthcare, preventive services, immunisation, screening, and health promotion programmes that strengthen campus health security and disease prevention. Clinical capacity is further reinforced by Hospital Sultan Abdul Aziz Shah, a teaching and referral hospital that supports medical education, specialist care, and translational research, extending UPM's public health contribution to the wider community.

Campus safety and occupational health are supported by the Auxiliary Police & Security Center (APSeC) and the Occupational Safety and Health Management Office (OSH), which oversee emergency response, hazard management, and compliance across laboratories, farms, workshops, and service areas. These functions reduce risk of exposure and contribute to safe and resilient learning and working environments. The UPM Veterinary Hospital complements this ecosystem through veterinary services, animal health diagnostics, and One Health initiatives that integrate human, animal, and environmental health.



Beyond campus boundaries, UPM strengthens social well-being through service learning, community partnerships, and targeted outreach addressing public health, livelihood enhancement, and capacity building, particularly among vulnerable groups. Complementary efforts in food safety, non-communicable disease prevention, and health literacy further reinforce healthy living practices. Emerging indicators such as the happiness index provide additional insight into psychological, social, and environmental dimensions of campus life. Under this Blueprint, this integrated approach operationalises planetary health and sustainability by aligning social cohesion, preventive healthcare, safety systems, and environmental responsibility.





Sustainability Rankings and Ratings

UPM's performance in global sustainability rankings and ratings supports the university's planetary health and sustainability agenda by providing structured benchmarks for reflection, improvement, and strategic alignment. Beyond recognising achievement, these frameworks help UPM identify strengths and gaps, strengthen accountability, and prioritise actions that link environmental integrity, human well-being, and institutional governance.

Participation in the Times Higher Education Sustainability (THE) Sustainability Impact Rankings assists UPM in aligning research, outreach, and operations with internationally recognised sustainability outcomes. The framework translates UPM's strengths in agriculture, public health, water management, and ecosystem science into measurable indicators, supporting evidence-based reporting and the integration of planetary health principles across teaching, research, and community engagement.

The QS World University Ranking: Sustainability offers a governance-focused lens that helps UPM assess environmental stewardship, social impact, and institutional systems. By highlighting areas such as data consistency and coordination, it functions as a diagnostic tool to strengthen sustainability management and embed planetary health considerations into policy and operations.

UPM's strong standing in the UI-GreenMetric Sustainability University Rankings reinforces its leadership in campus-based sustainability practices. The ranking encourages continuous improvement in green infrastructure, energy, waste, water, and mobility systems that directly influence environmental quality and human health. Collectively, these rankings function as strategic instruments that guide UPM's sustainability and planetary health transition while enhancing institutional learning, visibility, and long-term impact.



Challenges and Opportunities

Challenges

Despite UPM's strong institutional foundations, several structural and operational challenges hinder the effective advancement of the planetary health and sustainability agenda. Governance remains fragmented, with sustainability efforts dispersed across committees, faculties, and administrative units without a central coordinating mechanism. This fragmentation contributes to inconsistent data ownership, weak reporting systems, and significant underreporting of sustainability-related initiatives, limiting the university's ability to demonstrate its actual impact in global benchmarking exercises. Operational gaps are also evident in areas such as waste management, mobility systems, vendor compliance, and infrastructure modernisation. In addition, the absence of clear policy enforcement, combined with competing institutional priorities and a culture that often perceives sustainability as an additional administrative burden, slows the translation of awareness into concrete institutional practices.

Opportunities

Nevertheless, UPM possesses substantial opportunities to emerge as a regional leader in planetary health and sustainability. Its extensive expertise in agriculture, food systems, biodiversity, ecosystem management, and health sciences provides a unique platform for integrating ecological integrity with human well-being. The university's large green campuses, research institutes, living laboratories, and strong innovation ecosystem offer a rare environment for translating planetary health principles into real-world solutions. By strengthening governance structures, centralising sustainability coordination, improving data integration and reporting mechanisms, and embedding sustainability into institutional culture, UPM can transform existing strengths into a coherent strategic advantage. Such an approach would enable the university to move beyond fragmented initiatives and position itself as a national reference institution that demonstrates how universities can operationalise planetary health through research, education, campus operations, and community engagement.





Blue Ocean Approach

The Blueprint applies Blue Ocean Strategy to reposition UPM beyond conventional sustainability approaches and competitive benchmarking in higher education. Instead of operating within crowded spaces shaped by rankings or fragmented initiatives, the Blueprint establishes a differentiated institutional direction by positioning planetary health as UPM's core organising foundation, along side food security agenda. This enables the university to move beyond incremental actions toward a distinctive leadership role grounded in its scientific depth, historical strengths, and expansive campus ecosystem.

The strategy reframes sustainability from a compliance-driven obligation into a value-creating institutional platform that integrates ecological integrity, human well-being, and socio-economic resilience. UPM's foundations in agriculture, land stewardship, food systems,

and environmental sciences provide a natural advantage in leading this transition. By embedding planetary health across governance, research, teaching, campus operations, and external engagement, the Blueprint creates a strategic space for UPM to shape, rather than merely respond to, global sustainability agendas.

This Blueprint enables UPM to transform rising ESG expectations, climate risks, and policy pressures into institutional advantages by aligning sustainability with funding opportunities, industry collaboration, global visibility, and measurable outcomes. Ultimately, the Blueprint establishes a new value frontier in which UPM leads through coherence, systems thinking, and transformative impact in planetary health and sustainability.





CHAPTER 2

VISION AND ASPIRATION



Vision and Aspiration

Planetary stewardship as the guiding philosophy for UPM's transformation towards a just, resilient and regenerative future.

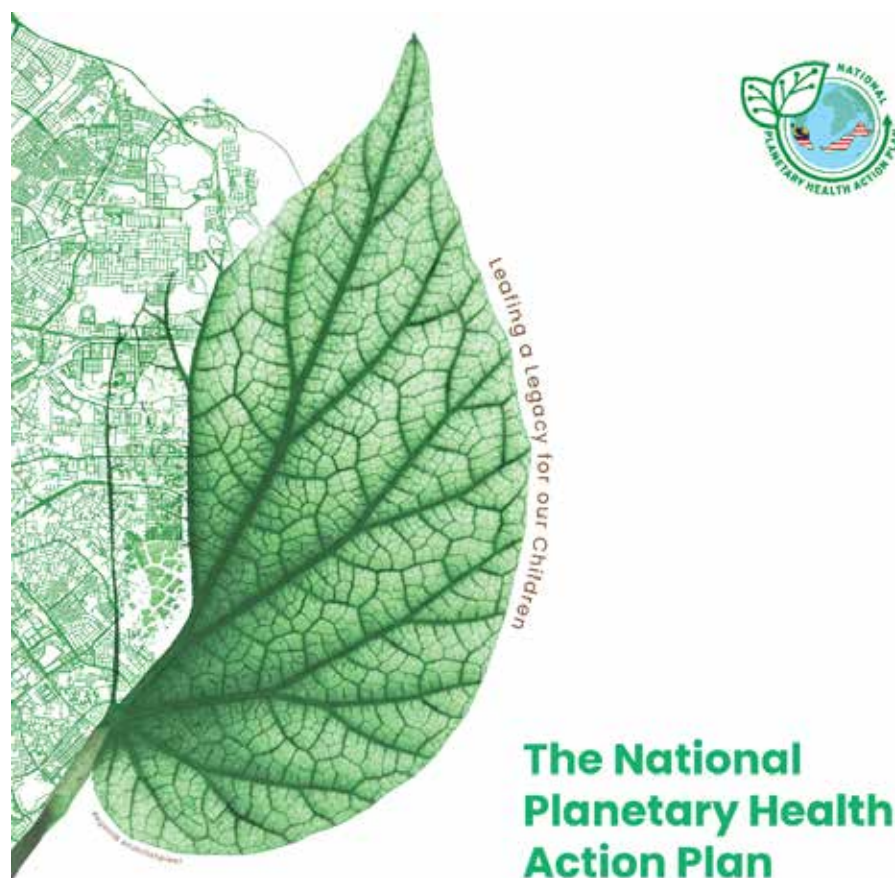
Aspirational Goal

UPM becomes a transformative university that safeguards people and the planet through responsible knowledge, resilient systems, regional leadership and sustainable ways of living.



Aspiration of the UPM's Blueprint for Planetary Health and Sustainability

The Planetary Health and Sustainability Blueprint envisions UPM as a transformative force in higher education and a university that not only responds to global challenges but actively shapes pathways toward a just, resilient, and regenerative future. It affirms UPM's commitment and ethos to safeguarding the well-being of people and the planet through excellence in education, research, governance, operations, and societal engagement.



The National Planetary Health Action Plan

This aspiration recognises anthropocene issues that define challenges of the 21st century. They require UPM's capability of systems leadership, ethical clarity, and adaptive innovation. Through this Blueprint, UPM commits to championing transdisciplinary and impactful solutions, advancing integrated research, innovation, and community-driven knowledge that address pressing planetary health challenges and position the University as a national and regional sustainability leader.

The Blueprint envisions a university where sustainability is not compartmentalised but seamlessly integrated into the fabric of institutional life. Academic programmes cultivate graduates who think systemically, act responsibly, and lead with foresight. Research agendas anticipate emerging risks and generate solutions grounded in scientific rigour, social relevance, and real-world

applicability. Governance structures embody transparency, accountability, and long-term stewardship. UPM commits to building a resilient, low-carbon, and planet-friendly campus that supports sustainable planning, digital systems, and sound financial governance.

Beyond institutional boundaries, the Blueprint affirms UPM's responsibility to empower communities, industries, and future generations. The university seeks to cultivate values, competencies, and innovation capabilities that enable students, staff, partners, and diverse communities, including B40, rural, and indigenous groups to thrive within planetary boundaries. Through inclusive engagement and equitable knowledge exchange, UPM strengthens its role as an anchor institution supporting resilience-building and sustainable development pathways.



At the national and regional levels, the Blueprint positions UPM as a catalyst for broader transformation by aligning its institutional strengths with key regulatory, policy, and strategic frameworks. Through institutional expertise, advisory leadership, and evidence-informed solutions, the University seeks to support national and regional sustainability transitions in line with major instruments such as the Environmental Quality Act 1974 (Act 127), the Occupational Safety and Health Act 1994 (Act 514), the National Policy on Climate Change 2.0, the National Energy Transition Roadmap (NETR), and The National Planetary Health Action Plan. These are further situated within broader global and conceptual reference points, particularly the United Nation's 17 Sustainable Development Goals and the Planetary Health Framework, which provide the basis for linking ecological integrity, human well-being, governance, and systems-based transformation. The Blueprint also recognises wider national and regional agendas, including RMK13, Malaysia MADANI, The National Planetary Health Action Plan, sectoral sustainability policies, ESG-related frameworks, and ASEAN collaborations. In doing so, UPM aspires to be recognised as a trusted referral point and thought leader in planetary health policy, sustainability governance, and evidence-informed institutional transformation.

Central to this vision is the commitment to nurture planetary-conscious graduates and leaders. UPM will embed holistic, ethical, transdisciplinary, and data-informed competencies across curricula and co-curricular experiences, preparing graduates not only for employment, but for leadership in societal transitions toward healthier, more equitable, and sustainable futures. Graduates are envisioned as stewards of knowledge and agents of change who carry planetary values into professional, civic, and community contexts.

This Blueprint is intended to guide UPM's strategic direction and long-term commitment over the next decade, from 2025 to 2035. It is conceived as a living and adaptive document, responsive to emerging scientific evidence, policy shifts, technological developments, and evolving societal needs. As planetary conditions and institutional contexts change, the Blueprint will remain fluid, periodically reviewed and refined to ensure continued relevance, coherence, and transformative impact.

This vision extends beyond immediate performance metrics. It is anchored in intergenerational responsibility for ensuring that today's decisions strengthen tomorrow's resilience. It affirms that institutional excellence must be defined not solely by rankings or outputs, but by meaningful contributions to ecological stability, social cohesion, and inclusive prosperity.

Through the Blueprint, UPM aspires to cultivate a legacy of stewardship, aligning academic excellence, impactful research, responsible operations, and strategic partnerships within a shared planetary ethic. In doing so, the university positions itself not merely as an observer of global transitions, but as an architect of sustainable futures at campus, community, national, and regional scales.

UPM'S Planetary Health and Sustainability Aspirations

1

Champion Transdisciplinary and Impactful Solutions

Advance integrated research, innovation, and community driven knowledge to address pressing planetary health challenges, embedding nature-based and technological solutions and systems approaches that restore ecological integrity while positioning UPM as a national and regional sustainability leader.

Build a Resilient, Low-Carbon and Planet-Friendly Campus

Model responsible consumption, circular resource systems, blue-green infrastructure, regenerative landscapes, and carbon-smart operations supported by sustainable planning, digital systems, and financial governance.

2

3

Empower Communities, Industries, and Future Generations

Cultivate values, competencies, and innovation capabilities that enable students, staff, partners, and diverse communities including B40, rural, and indigenous groups to thrive within planetary boundaries.

Drive National and Regional Transformation

Strengthen UPM's influence in sustainability policy and practice by contributing institutional expertise, advisory leadership, and evidence-informed solutions to national transition agendas (RMK13, NETR, Malaysia MADANI) and ASEAN collaborations.

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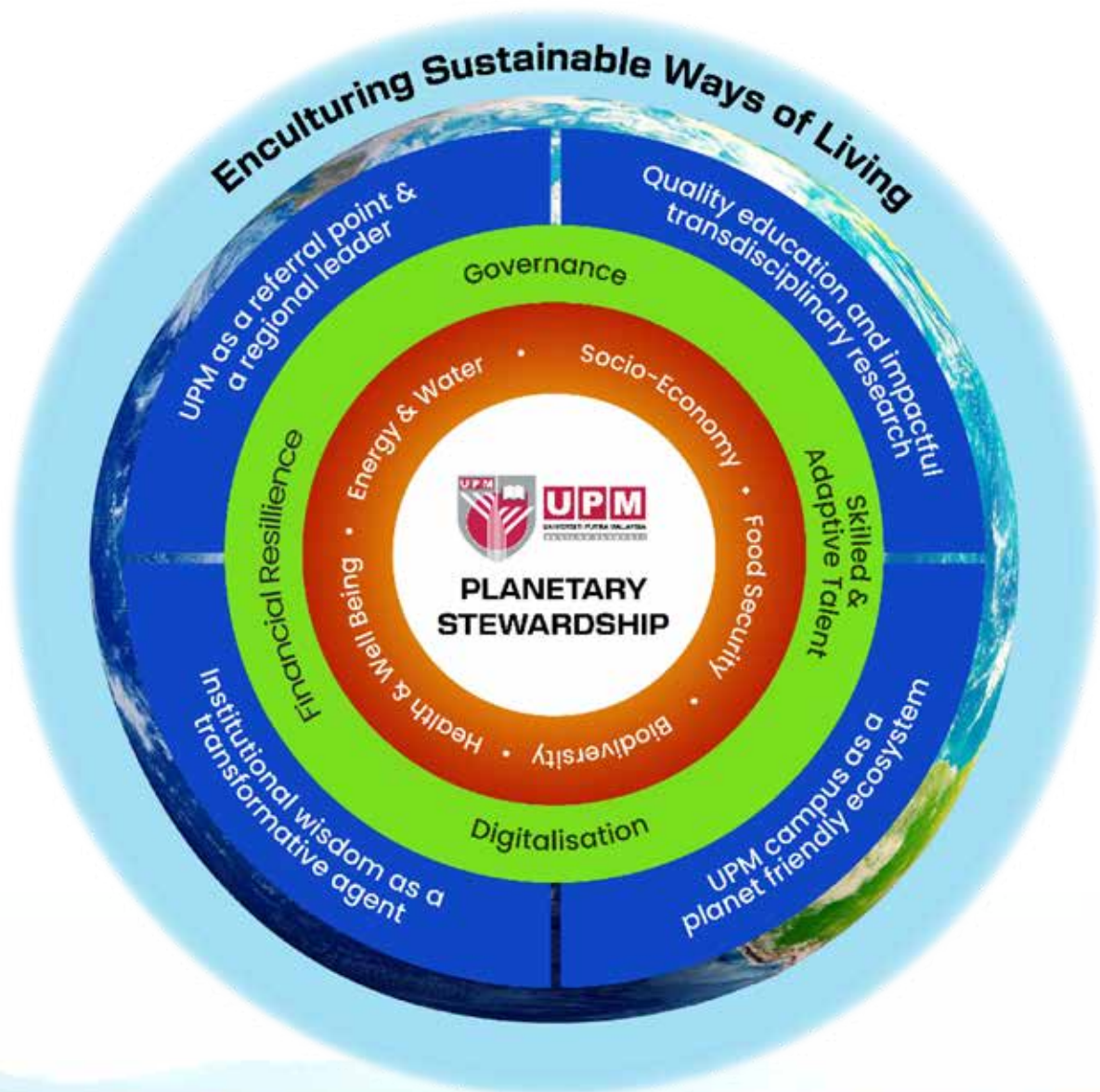
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Nurture Planetary Conscious Graduates and Leaders for Intergenerational Stewardship

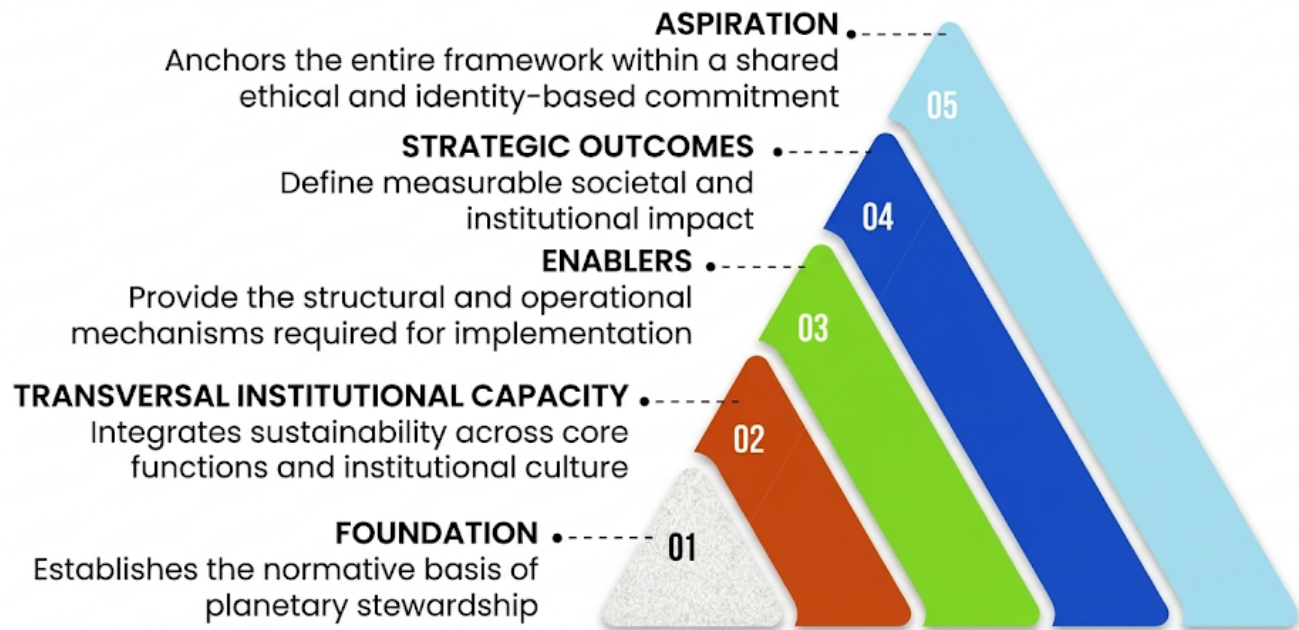
Embed holistic, ethical, transdisciplinary, and data informed competencies across curricula and co-curricular experiences to prepare graduates not only for employment, but for leadership in societal transitions toward healthier, more equitable, and sustainable futures that safeguard the well-being of present and future generations.



UPM Planetary Health and Sustainability



Framework





Concentric Layers of UPM's Planetary Health & Sustainability

The UPM Planetary Health and Sustainability Framework is conceptualised as a layered and integrated institutional model that symbolically reflects the structure of the Earth system. The visual design, set against the image of the planet, conveys the university's recognition that it operates within, and remains accountable to, the broader ecological system upon which human and societal well-being depend.

The concentric configuration signifies coherence, protection, and interdependence. It illustrates that sustainability transformation does not occur through isolated initiatives. Rather, it requires systemic alignment across governance, academic practice, research orientation, operational management, and external engagement.

Each layer performs a distinct but interconnected function. These layers articulate how institutional purpose, operational systems, and societal contribution are aligned within a unified planetary health and sustainability agenda. The framework reinforces the principle academic of excellence, innovation, financial sustainability, and community engagement must be coherently structured within ecological limits and guided by long-term and intergenerational responsibility.

The UPM Planetary Health and Sustainability Framework is structured through five concentric layers that collectively articulate the University's systemic approach to transformation. These layers reflect the interdependent nature of institutional change, where foundational commitments inform institutional capacities, capacities activate enabling mechanisms, enabling mechanisms drive strategic outcomes, and all dimensions are anchored in a shared core value.

Moving from the innermost to the outermost dimensions of the framework comprises, the Framework comprises: Foundation, Transversal Institutional Capacity, Transformational Enablers, Strategic Outcomes and the Core Value.

Foundation: Planetary Stewardship

Planetary Stewardship constitutes the core value of the Blueprint. It is defined as the collective and ethical custodianship of the Earth system, whereby institutions and societies assume responsibility to care for, protect, and regenerate ecological and social systems while guiding development within planetary limits. This definition establishes UPM's commitment to align its academic, research, operational, and partnership activities with a systems oriented and future conscious responsibility.

This core value situates UPM within the broader planetary health and sustainability discourse, recognising the interdependence between human systems and the biosphere. It affirms that long term institutional success is inseparable from environmental stability, social cohesion, and responsible resource governance.

Beyond a declarative stance, Planetary Stewardship functions as a guiding doctrine for institutional conduct. It shapes how UPM interprets risk, innovation, and growth amid climate volatility, biodiversity decline, public health uncertainty, and socio economic inequality. Decision making across governance, academic design, research prioritisation, and operations is therefore assessed not only for performance, but for contributions to long term resilience, ecological responsibility, and intergenerational equity.

As the core value of the Blueprint, Planetary Stewardship provides coherence and strategic direction for UPM's transformation into a resilient and responsible university at campus, national, and regional scales.

Transversal Institutional Capacity

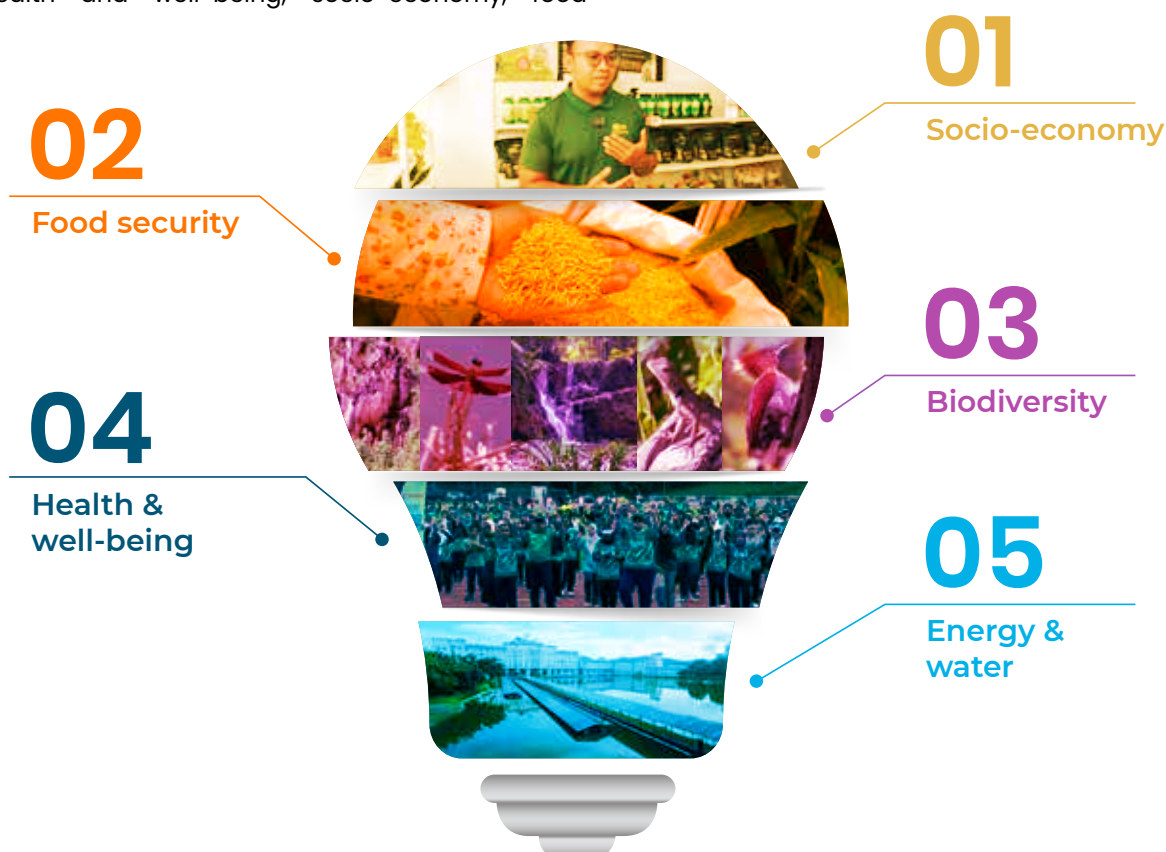
Encircling the Foundation is the layer of **Transversal Institutional Capacity**. This layer represents the university's integrated capability to address complex planetary health challenges through its overall functions. It defines the cross-cutting priority domains through which sustainability is substantively institutionalised within UPM.

The designation *transversal* emphasises its integrative and system-wide function. These capacities extend across faculties, research clusters, centres of excellence, administrative units, and campus operations. They provide a structural platform that aligns education, research, innovation, infrastructure management, financial planning, and community engagement under a unified planetary health and sustainability agenda. This layer ensures that planetary health and sustainability priorities are embedded within mainstream institutional planning, governance, and performance frameworks.

The Transversal Institutional Capacity comprises five interconnected priority domains which are health and well-being, socio-economy, food

security, biodiversity, and energy and water. These domains represent the University's principal sustainability priorities and reflect the multidimensional and interdependent nature of planetary health.

i. **Health and Well-being** address the physical, psychological, and social determinants of human flourishing, recognising that human health is inseparable from environmental quality and social stability. Within UPM, this is operationalised through an integrated campus ecosystem that strengthens preventive healthcare, clinical services, and campus health security. Mental resilience and active lifestyles are supported through counselling services, peer support systems, and sports and recreational programmes. Occupational safety frameworks, campus security coordination, food safety practices, and accessible spiritual facilities contribute to safe and inclusive environments. These mechanisms position health and well-being as a foundational pillar of UPM's planetary stewardship agenda.





ii. Socio-Economy focuses on equitable development, inclusive growth, distributive justice, and resilient economic systems that operate within ecological limits. In UPM's context, this is reflected in efforts to align research, innovation, procurement, and partnership models with responsible value creation and long-term sustainability. The university supports inclusive access to education, community capacity building, and industry collaboration that strengthens local livelihoods while promoting ethical and environmentally responsible practices. This includes empowering women, strengthening the role of local communities, and supporting inclusive participation in sustainability-related education, entrepreneurship, leadership, and community-based initiatives. Financial governance, entrepreneurship initiatives, and resource efficiency measures further reinforce institutional resilience. These approaches embed socio-economic responsibility within UPM's Planetary Health and Sustainability Framework, balancing economic progress with social equity, gender inclusion, community well-being, and ecological integrity.

iii. Food Security encompasses sustainable agricultural systems, nutrition, supply chain resilience, and resource efficient production models. This is advanced through integrated initiatives that strengthen sustainable farming practices, climate adaptive agriculture, and responsible land and water management. These innovations support productivity while reducing environmental impact. Campus based initiatives and community partnerships further enhance nutrition awareness and local food resilience. These efforts position food security as a strategic pillar of UPM's planetary health and sustainability agenda.

iv. Biodiversity emphasises ecosystem integrity, conservation science, and nature-based solutions critical to long term environmental stability. This pillar is advanced through research, habitat conservation, and landscape management practices that protect flora and fauna across campus and surrounding ecosystems. Teaching and field-based learning strengthens ecological literacy, while restoration initiatives and green infrastructure demonstrate applied conservation approaches. Collaborative projects further support ecological monitoring, data generation, and evidence informed stewardship. These efforts reinforce ecological resilience and responsible environmental management at local and regional scales.

v. Energy and Water addresses resource efficiency, low carbon transitions, water security, and integrated resource management essential to climate resilience and sustainable development. This domain is advanced through initiatives that promote renewable energy adoption, energy conservation, carbon intensity reduction, and water efficiency across campus operations. Through efficiency measures, intelligent systems, and behavioural change initiatives, the university advances responsible energy and water consumption alongside cost optimisation.

These five domains are inherently interdependent. Food security depends on biodiversity conservation and sustainable water systems. Energy transitions influence socio-economic resilience and distributive equity. Health and well-being are shaped by environmental conditions, access to resources, and broader social determinants. Biodiversity loss affects food systems, climate regulation, and public health outcomes. Such interconnections reflect a systems-based understanding of planetary health and sustainability, recognising that ecological stability, human development, and economic structures are dynamically linked. Accordingly, strengthening institutional capacity must be systemic rather than sectoral.

Transformational Enablers

The third layer comprises the Transformational Enablers, which operationalise Planetary Health and Sustainability Framework and reinforce Transversal Institutional Capacity. The enablers provide the mechanisms through which strategy is translated into implementation.

The Transformational Enablers consist of, governance, skills and adaptive talent, digitalisation, financial resilience and health and well-being. These enablers constitute the structural, human, technological, and financial architecture required to sustain institutional transformation.

i. **Governance** functions as the institutional backbone that enables planetary health to be embedded coherently across teaching, research, operations, and external engagement. It encompasses formal policies, leadership structures, accountability mechanisms, and decision-making processes that translate institutional commitments into coordinated and enforceable action. In the context of

planetary health, governance is critical because the challenges involved are systemic and cross-cutting, requiring alignment across faculties, administrative units, and operational domains rather than reliance on isolated projects or individual champions. Strong governance ensures continuity, policy coherence, and accountability, safeguarding planetary health efforts beyond short leadership cycles or ad hoc initiatives.

ii. **Skills and Adaptive Talent** refer to the human capabilities needed to operationalise planetary health across all levels of the university, including academic and professional staff, students, leaders, and external service providers. Beyond technical expertise, this enabler emphasises system thinking, ethical reasoning, adaptability, collaboration, and problem-solving to address complex socio-ecological challenges. Planetary health is enacted not only through teaching and research but also through everyday operational practices, making institution-wide capacity development essential.





iii. Digitalisation refers to the strategic use of digital systems, data infrastructure, and smart technologies to support planetary health across the university, including institutional systems and applied solutions such as sensors, Internet of Things (IoT) devices, automation, and digital platforms for real-time monitoring. Within a planetary health framework, it extends beyond administrative functions to link governance, teaching, research, campus operations, and living laboratories. This is essential as planetary health challenges require reliable data for evidence-based decision-making and practical interventions. Digitalisation must therefore be practical and outcome-oriented, ensuring systems are translated into actionable use across faculties and operations, while addressing fragmented data and underreporting through a centralised data ecosystem, and fostering a strong data culture grounded in ownership, accountability, and intelligence-led decision-making.

iv. Financial Resilience refers to the institution's capacity to secure, manage, and sustain financial resources that support planetary health over the long term. Rather than short-term project funding, it emphasises institutional financial structures that enable continuity, adaptability, and strategic investment. As planetary health initiatives often require long time horizons, cross-sector partnerships, and the ability to manage uncertainty, stable and diversified financing is essential to ensure credibility and scalability. What financial resilience means is the strengthening of UPM's ability to mobilise sustainable funding, reduce dependence on limited internal allocations, and generate value from sustainability-related expertise, services, partnerships, and innovation. At UPM, sustainability initiatives are supported through institutional budgets, competitive research grants, and external funding, drawing on strong research and innovation capacity. This also requires innovation in identifying new streams of income, including value creation from sustainability expertise, ESG-related services, strategic partnerships, and impact-driven investment opportunities.



Through this structured enabling framework, UPM strengthens its capacity to sustain long-term institutional resilience while advancing substantive contributions to planetary health and societal well-being.

Strategic Outcomes

Encircling the Framework are the **Strategic Outcomes**, representing UPM's outward-facing impact and long-term institutional ambition. These outcomes function as the university's strategic compass, guiding decisions, investments, partnerships, and transformation efforts across academic, research, operational, and engagement domains. The four Strategic Outcomes are:

- i. Quality Education and Impactful Transdisciplinary Research
- ii. UPM Campus as a Planet-Friendly Ecosystem
- iii. Institutional Wisdom as a Transformative Agent
- iv. UPM as a Referral Point and a Regional Leader

These outcomes demonstrate how strengthened foundations, transversal capacities, and enabling systems converge to produce measurable societal contribution and institutional distinction.

Quality Education and Impactful Transdisciplinary Research

This outcome reflects UPM's commitment to delivering high-quality education that systematically embeds planetary health competencies across disciplines. It seeks to cultivate graduates equipped with systems thinking, ethical responsibility, adaptive capacity, and innovation capability necessary to address complex environmental and societal challenges. Alumni can further champion sustainability and planetary health by applying these values in professional practice, industry leadership, community engagement, and policy influence.

In parallel, UPM advances transdisciplinary research that integrates scientific, technological, social, and policy perspectives. Research excellence is defined not solely by scholarly output, but by its capacity to generate actionable solutions to interconnected challenges, including climate change, food–water–energy security, biodiversity degradation, and public health risks.

Academic excellence is thereby positioned as a strategic driver of societal resilience and sustainability transitions. This is further strengthened through the introduction of research-informed academic programmes that enrich learners' knowledge, skills, and applied understanding of planetary health and sustainability.

UPM Campus as a Planet-Friendly Ecosystem

This outcome envisions the transformation of the UPM campus into a living laboratory that demonstrates sustainability in practice. The campus becomes a model ecosystem in which blue–green infrastructure, low-carbon operations, circular resource systems, regenerative landscapes, and nature-based solutions are systematically integrated into planning and daily operations.

Beyond operational performance, this transformation strengthens experiential learning, applied research, and community engagement. The campus serves simultaneously as an operational model, an innovation platform, and a demonstration site for scalable sustainability practices.

Institutional Wisdom as a Transformative Agent

This outcome recognises the strategic value of accumulated institutional experience, contextual knowledge, and local and indigenous perspectives in shaping sustainability pathways. Planetary health transitions must be grounded in place-based realities, cultural understanding, and long-standing community relationships.

By strengthening governance models, codifying best practices, and integrating diverse knowledge systems, UPM builds institutional wisdom that is replicable, adaptive, and transferable. The University's role extends beyond knowledge production to knowledge integration, translation, and application across sectors.

UPM as a Referral Point and a Regional Leader

This outcome articulates UPM's aspiration to be recognised as a regional referral point and thought leader in planetary health. It positions the University as a trusted partner for government, industry, civil society, and regional networks through advisory engagement, policy contribution, research collaboration, and capacity-building initiatives.

By contributing evidence-based recommendations and strategic partnerships at national and ASEAN levels, UPM extends its influence beyond campus boundaries and consolidates its standing globally.



Strategic Impact: Enculturing Sustainable Ways of Living

Encircling the entire framework is the overarching goal of **Enculturing Sustainable Ways of Living**, positioned as the outermost layer analogous to the Earth's atmosphere. Just as the atmosphere envelops, protects, and regulates planetary systems, this strategic impact sustains life and maintains balance.

Enculturing Sustainable Ways of Living signifies that sustainability must become embedded within the university's collective mindset and everyday conduct. It moves beyond structural reforms, policies, or technical systems to cultivate shared values, norms, and behaviours that guide how decisions are made, how resources are managed, and how responsibilities are exercised.

As a strategic impact, it reflects a commitment to stewardship, ethical responsibility, systems thinking, and intergenerational accountability. Like the atmosphere, which invisibly shapes and stabilises the conditions for life, this cultural layer shapes and stabilises the institutional environment within which all strategies and actions operate.

By positioning this goal as the outermost layer, the framework affirms that lasting transformation depends not only on institutional mechanisms but on deeply internalised values. Enculturing Sustainable Ways of Living therefore represents the enduring ethos of the Blueprint.

CHAPTER 3

ENABLERS

Enabler 1: **Governance**

The institutional backbone that ensures Planetary Stewardship is embedded across UPM's leadership and management architecture.

Enabler 2: **Skilled and Adaptive Talents**

The human capabilities needed to operationalise planetary health and sustainability across all levels of the university.

Enabler 3: **Digitalisation**

The strategic deployment of digital systems, data infrastructure and smart technologies to advance planetary health and sustainability across UPM.

Enabler 4: **Financial Resilience**

The capacity to secure, manage and sustain financial resources in support of planetary health and sustainability over the long term.



ENABLER 1: Governance

Governance functions as the institutional backbone that ensures Planetary Stewardship is embedded systematically across UPM's leadership and management architecture. It translates the vision of the Blueprint into structured authority, accountability, and operational coherence at all institutional levels.



At UPM, governance must operate vertically and horizontally. Vertically, it aligns planetary health priorities from the University's highest decision-making bodies, including the Board of Directors (*Lembaga Pengarah Universiti*) and the University Management Committee or *Jawatankuasa Pengurusan Universiti (JPU)*, Senate, Deputy Vice-Chancellor portfolios, down to Responsibility Centre, *Pusat Tanggungjawab (PTJ)* implementation units. Horizontally, it ensures coordination across academic, research and development, student affairs, finance, and administrative divisions.

At the strategic level, planetary health and sustainability considerations should inform institutional direction-setting, policy endorsement, risk oversight, and long-term capital planning. At the middle management level, Deans, Directors, and Heads of Departments play a critical role in translating institutional direction into faculty-level academic design, research focus areas, staffing priorities, and operational decisions. At the *PTJ* level, sustainability becomes embedded in day-to-day implementation, including budgeting decisions, procurement practices, infrastructure management, and programme delivery.

This multi-level governance alignment ensures that planetary health and sustainability is not confined to a central sustainability unit but integrated into mainstream authority structures. Each leadership tier carries defined responsibility for stewardship within its sphere of control.

Governance under this Blueprint is not compliance-driven alone. It is anticipatory, adaptive, and performance oriented. It strengthens institutional discipline while enabling flexibility in implementation across diverse *PTJs*. It also ensures continuity beyond leadership cycles by embedding sustainability into formal institutional processes rather than relying on individual champions.

Through this approach, governance transforms planetary health and sustainability from a thematic agenda into a structured institutional obligation, embedded within UPM's planning systems, performance review mechanisms, and accountability frameworks.



Scope

The scope of Governance under this Blueprint encompasses the institutional integration, policy strengthening, and coordinated execution of UPM's planetary health and sustainability agenda.

First, it involves mainstreaming planetary health and sustainability within UPM's governance ecosystem. This requires embedding sustainability considerations into strategic planning frameworks, Senate deliberations, management directives, financial governance processes, and institutional oversight mechanisms. Sustainability must be reflected in how priorities are defined, risks are assessed, and performance is reviewed.

Second, the scope includes strengthening and harmonising UPM's policies and guidelines relating to planetary health and sustainability. Existing policies, operational manuals, procurement guidelines, development plans, and academic regulations should be reviewed and aligned to ensure coherence with stewardship principles. Governance instruments must reflect institutional commitment and provide clear direction to PTJs.

Governance – Scope

- Mainstreaming the planetary health and sustainability agenda in UPM governance
- Strengthening UPM policies and guidelines on planetary health and sustainability
- Coordinating the implementation of UPM's planetary health and sustainability initiatives

Third, governance must coordinate the implementation of UPM's planetary health and sustainability initiatives across units and portfolios. Given the transversal nature of sustainability challenges, structured coordination mechanisms are required to converge implementation. Governance therefore functions not only as oversight, but as an integrative platform enabling alignment and coherence across various unit and levels at the university.

Key Initiatives

To operationalise Governance as a transformational enabler, UPM will implement a structured set of institutional initiatives designed to strengthen coherence, accountability, and strategic continuity.

Establishment of a Central Planetary Health and Sustainability Coordination Centre

UPM shall strengthen institutional governance and coordination through the establishment of a central Planetary Health and Sustainability coordination centre. This entity will function as a strategic integrator, ensuring alignment across portfolios, faculties, centres of excellence, and administrative units.

The centre will consolidate sustainability reporting, provide technical and strategic support to PTJs, monitor performance indicators, and facilitate cross-functional collaboration. By institutionalising coordination at the central level, UPM enhances vertical alignment between executive leadership and operational implementation while reducing fragmentation across initiatives.



Mainstreaming Sustainability into Institutional Decision-Making

Sustainability will be embedded as a standard criterion within institutional decision-making processes. Planetary health considerations will be integrated into:

- Strategic and operational planning approvals
- Policy formulation and review
- Financial deliberations and budget allocations
- Infrastructure and development proposals
- Institutional performance evaluation frameworks

This mainstreaming ensures that sustainability is not treated as a parallel agenda, but as an integral dimension of institutional governance. Decisions will be assessed in relation to long-term ecological impact, distributive equity, risk exposure, and intergenerational responsibility.

Strengthening Accountability, Transparency, and Nature-Based Governance

UPM will enhance accountability and transparency through the systematic adoption of sustainability-aligned governance practices, including the integration of nature-based solutions within campus planning and operational strategies.

Nature-based approaches will be recognised not only as technical interventions, but as governance commitments reflecting ecological responsibility and systems thinking. Institutional transparency mechanisms, including structured reporting, performance dashboards, and public disclosures, will support clear communication of sustainability progress, institutional impact, and areas requiring improvement.



Governance – Key Initiatives

- Strengthen institutional governance and coordination by establishing a central Planetary Health and Sustainability coordination centre
- Mainstream sustainability into institutional decision-making
- Enhance accountability and transparency through institution-wide adoption of nature-based solutions

These initiatives reinforce vertical alignment from central leadership to PTJ-level implementation and strengthen horizontal coordination across academic, operational, and administrative portfolios. Governance thus becomes an active instrument of transformation, ensuring that planetary stewardship is embedded within institutional systems and sustained over the long term.

Key Initiative Outcomes

These initiatives are designed to institutionalise planetary health and sustainability as core governance priorities within UPM. Governance processes will demonstrate coordinated implementation, evidence-informed decision-making, and transparent accountability across all levels of the University.

Over time, planetary health and sustainability considerations will be structurally embedded within strategic and operational plans. PTJs will operate within a coherent governance environment in which planetary health and sustainability expectations are clearly articulated, and consistently reinforced through oversight mechanisms.

This progression establishes planetary health and sustainability not as an episodic initiative, but as a permanent dimension of institutional governance. Decision pathways, resource allocations, and programme evaluations will systematically reflect long-term ecological responsibility, distributive fairness, and resilience-oriented planning.

The intended outcome is a governance ecosystem that is anticipatory, adaptive, and integrated, capable of sustaining long-term institutional transformation while safeguarding academic excellence, operational integrity, and strategic continuity.



Governance – Key Initiative Outcome

Institutionalise planetary health and sustainability as core governance priorities, ensuring coordinated implementation, informed decision-making, and transparent accountability across all levels of the university.

Key Initiatives Indicators

The following indicators provide structured reference points to assess the effectiveness, coherence, and institutional integration of governance under the this Blueprint. They evaluate the extent to which planetary health and sustainability principles are embedded within UPM's leadership, decision-making systems, and accountability mechanisms across the University.

Institutional Structure and Coordination

- Formal establishment and operational functioning of a central Planetary Health and Sustainability coordination centre
- Existence of cross-portfolio coordination mechanisms supporting sustainability integration
- Structured reporting of sustainability matters across management levels and governance.

Strategic and Policy Integration

- Integration of planetary health and sustainability principles within UPM strategic documents, governance frameworks, and policy instruments
- Alignment between central sustainability directives and faculty or PTJ strategic and operational plans
- Incorporation of sustainability considerations within institutional planning and operations.



Leadership Accountability and Role Clarity

- Clear articulation of planetary health and sustainability roles and responsibilities across leadership tiers
- Inclusion of planetary health and sustainability responsibilities within leadership mandates and performance frameworks

Monitoring, Review, and Transparency

- Periodic institutional review of planetary health and sustainability priorities
- Transparent communication of institutional planetary health and sustainability commitments, progress, and impact

These indicators signal the maturity of governance alignment, the clarity of accountability structures, and the degree to which planetary health and sustainability is structurally embedded within UPM's institutional systems. They distinguish between symbolic commitment and operational integration, providing measurable evidence that planetary health is incorporated within the University's governance.



ENABLER 2: Skilled and Adaptive Talents

Skills and adaptive talent refer to the human capabilities needed to operationalise planetary health and sustainability across all levels of the university. This enabler emphasises systems thinking, and problem-solving to address complex socio-ecological challenges. Planetary health and sustainability is enacted not only through teaching and research but also through everyday operational practices, making institution-wide capacity development essential.

Skills and Adaptive Talents – Scope

- Ensuring the availability of UPM talent with expertise in planetary health and sustainability
- Ensuring UPM talent that is capable and adaptable of practising sustainable lifestyles

Scope

The scope of Skills and Adaptive Talent focuses on strengthening the capability, and commitment of UPM's human capital in advancing planetary health and sustainability.

First, it encompasses ensuring the availability of talent with relevant expertise. This includes strengthening academic and research capacity across pertinent disciplines to possess adequate knowledge to integrate planetary health and sustainability considerations within their respective domains.

Second, the scope extends to cultivating adaptive and sustainability-aligned professional conduct. Planetary health and sustainability must be reflected in formal academic discourse, behavioural norms, and decision-making practices. This requires embedding values-driven conduct, environmental responsibility, and stewardship-oriented mindsets across the University community. It also involves nurturing influential champions and change agents who can inspire, mobilise, and sustain planetary health practices across institutional and societal settings.

Through this scope, Skills and Adaptive Talent bridge formal knowledge development with lived institutional practice.

Key Initiatives

To operationalise this enabler, UPM will embed planetary health and sustainability across learning and awareness programmes at multiple levels. Planetary health and sustainability literacy will be strengthened within formal and informal initiatives, that reaches the UPM community.

UPM will also strengthen talent development through interdisciplinary collaboration. Given the interconnected nature of planetary health and sustainability challenges, structured opportunities for cross-PTJ engagement will be prioritised. This fosters integrative thinking and reduces disciplinary silos.

In parallel, the UPM will cultivate planetary health and sustainable leadership and lifestyles. This key initiative will encourage responsible resource use, conscious consumption, and sustainability-aligned professional behaviour across the campus community.



Skills and Adaptive Talents – Key Initiatives

- Embed planetary health and sustainability across learning and awareness programmes
- Strengthen talent development through interdisciplinary collaboration
- Cultivate sustainable leadership and lifestyles

Key Initiatives Outcomes

These initiatives aim to develop a skilled, adaptive, and values-driven university community capable of embedding planetary health and sustainability into everyday practice.

Over time, UPM will strengthen institutional capacity by ensuring that academic and professional talent demonstrate systems awareness, ethical responsibility, and interdisciplinary competence. Leadership across all levels will shape planetary health stewardship as institutional norms. The intended outcome is a resilient and future-ready institutional culture in which planetary health is not only taught and researched, but internalised and practised.



Skills and Adaptive Talents – Key Initiative Outcomes

Build a skilled, adaptive, and values-driven university community capable of embedding planetary health and sustainability into learning, leadership, and everyday practices.

- Availability of co-curricular and experiential learning opportunities reinforcing planetary health and sustainability awareness and responsible practice

These measures evaluate whether planetary health and sustainability is systematically integrated into formal and informal learning pathways rather than treated as an elective or peripheral topic.

Key Initiatives Indicators

The following indicators provide structured reference points to assess the effectiveness, coherence, and institutional integration of governance under the this Blueprint. They evaluate the extent to which sustainability competencies, adaptive capability, and stewardship values are embedded within UPM's academic ecosystem, leadership culture, professional development systems, and everyday institutional practices.

Talent Availability and Expertise

- Availability of academic and professional staff with demonstrated expertise in planetary health and sustainability-related domains
- Integration of planetary health and sustainability competencies within recruitment, appointment, and talent development frameworks
- Institutional support mechanisms for interdisciplinary scholarship and cross-PTJ expertise development

These indicators assess whether the University possesses sufficient intellectual depth and interdisciplinary capacity to support planetary health priorities.

Curriculum and Learning Integration

- Integration of planetary health and sustainability principles across academic curricula and disciplines
- Embedding of planetary health and sustainability competencies within graduate attributes and programme learning outcomes

Professional Development and Interdisciplinary Capacity

- Structured professional development programmes addressing planetary health and sustainability literacy
- Institutional platforms facilitating interdisciplinary collaboration and knowledge exchange
- Leadership development initiatives incorporating stewardship principles and long-term planetary health and sustainability orientation

These indicators examine UPM's capacity to cultivate adaptive competence and cross-disciplinary integration among staff.

Behavioural Alignment and Sustainable Lifestyles

- Institutional initiatives promoting responsible resource use and sustainable campus behaviour
- Evidence of planetary health and sustainability values reflected in professional conduct and workplace culture
- Awareness programmes reinforcing stewardship-oriented mindsets among community members

These measures assess the degree to which planetary health and sustainability is internalised within institutional culture and daily practice.

Monitoring and Cultural Integration

- Periodic review of institutional capacity in planetary health and sustainability competencies
- Alignment between institutional planetary health and sustainability commitments and demonstrated behavioural practices
- Documentation of talent development progress in advancing planetary health and sustainability objectives

These indicators evaluate whether human capital development is systematically monitored and aligned with strategic planetary health and sustainability goals.

Through this structured assessment framework, UPM is able to determine whether sustainability is confined to academic discourse or embedded within the University's intellectual, professional, and cultural fabric, ensuring that its community is equipped not only to understand planetary health and sustainability challenges, but to operationalise solutions into everyday practice.





ENABLER 3: Digitalisation

Digitalisation refers to the strategic deployment of digital systems, data infrastructure, and smart technologies to advance planetary health and sustainability across UPM. It encompasses institutional information systems as well as applied technologies, including sensors, Internet of Things (IoT) devices, automation tools, data analytics platforms, and digital dashboards that enable real-time monitoring.

Within the Framework, digitalisation extends beyond administrative digitisation. It functions as a core institutional capability that connects governance, teaching, research, campus operations, and living laboratory initiatives. Integrated, reliable, and accessible data systems are essential for evidence-informed decision-making.

Planetary health and sustainability challenges are dynamic, complex, and interdependent. Institutional responses therefore require digital infrastructure capable of generating actionable insights across multiple domains, including energy and water consumption, carbon performance, biodiversity management, waste systems, mobility patterns, and health indicators. Digital integration enhances cross-portfolio coordination, strengthens transparency, and supports continuous institutional learning. This creates a feedback loop between operational practice, academic research, and governance oversight.

Digitalisation thus strengthens UPM's capacity to anticipate emerging risks, improve operational efficiency, optimise resource allocation, and enhance institutional accountability. As an enabling architecture, it ensures that planetary health and sustainability stewardship is supported by measurable, data-driven, and adaptive institutional systems.

Scope

The scope of Digitalisation under this Blueprint focuses on embedding sustainable, ethical, and responsible digital practices within UPM's institutional systems. Digital transformation is positioned not merely as technological advancement, but as a governance-aligned and values-driven institutional capability.

First, the scope encompasses the implementation of sustainable and responsible digitalisation approaches. Digital transformation must integrate robust data governance, cybersecurity safeguards, privacy protection, and responsible data stewardship. It must also consider the environmental footprint of digital infrastructure, including energy consumption, lifecycle management of hardware, and long-term technological sustainability. Ethical standards must guide the collection, storage, processing, and application of institutional data to ensure trust, compliance, and accountability.



Second, digital innovation must be balanced against its broader social and ecological implications. Digital solutions should enhance, human well-being, social equity, accessibility, and environmental responsibility. Where applicable, research-related digital applications must also consider ethical treatment of living systems. This principle ensures that digital transformation strengthens institutional resilience without generating unintended systemic risks. Equally important is the development of a strong data culture that promotes data ownership, accuracy, accountability, and the responsible use of intelligence for informed decision-making.

Third, the scope includes leveraging digital technologies to strengthen the management and implementation of planetary health and sustainability initiatives. Digital platforms should enable integrated sustainability reporting, cross-portfolio coordination, operational optimisation, research collaboration, and real-time performance monitoring across faculties and PTJs. Interoperable systems and shared data environments are essential to support institutional coherence and adaptive governance. Through this defined scope, digitalisation becomes an enabling infrastructure for continuous institutional improvement.

Key Initiatives

To operationalise digitalisation as a transformational enabler, UPM will establish an integrated digital data and reporting system for the systematic recording of resource use and planetary health and sustainability-related information across the University. This system will consolidate data streams from multiple units, ensuring consistency, comparability, and institutional visibility.

UPM will also develop a centralised sustainability dashboard that enables consolidated data access, real-time monitoring, and structured tracking of progress across planetary health and sustainability agendas. This dashboard will serve as a strategic interface linking governance oversight with operational data.

In addition, the University will optimise digital systems and smart monitoring technologies within daily operations to support real-time surveillance, early action, and preventive decision-making. Smart campus infrastructure will strengthen institutional responsiveness to environmental and operational risks while enhancing efficiency. These initiatives will establish digitalisation as a core institutional capability supporting transparency, accountability, and adaptive management.

Digitalisation – Scope

- Ensuring the implementation of sustainable, ethical, and responsible digitalisation approaches
- Balancing digital innovation with impacts on the well-being of humans, animals, the environment, and institutions
- Leveraging the use of digital technologies in the management and implementation of planetary health and sustainability at UPM

Digitalisation – Key Initiatives

- Establish an integrated digital data and reporting system for systematic recording of resource use and sustainability-related information across the university.
- Develop a centralised sustainability dashboard to enable consolidated data access, real-time monitoring, and tracking of progress on planetary health and sustainability agendas.
- Optimise digital systems and smart monitoring technologies within daily operations to support real-time surveillance, early action, and preventive decision-making.



Key Initiatives Outcomes

These initiatives are designed to strengthen UPM's institutional capacity to monitor, manage, and proactively advance planetary health and sustainability performance.

Over time, digital integration will enhance institutional visibility of resource flows, operational efficiency, environmental indicators, and sustainability metrics across PTJs. Consolidated and interoperable data systems will enable leadership to access reliable performance insights, supporting informed decision-making.

The intended outcome is a digitally enabled university ecosystem in which planetary health and sustainability performance is measurable, and continuously improved through evidence-informed governance and smart operational practices.

Digitalisation - Key Initiative Outcome

Strengthening UPM's ability to monitor, manage, and proactively advance planetary health and sustainability performance

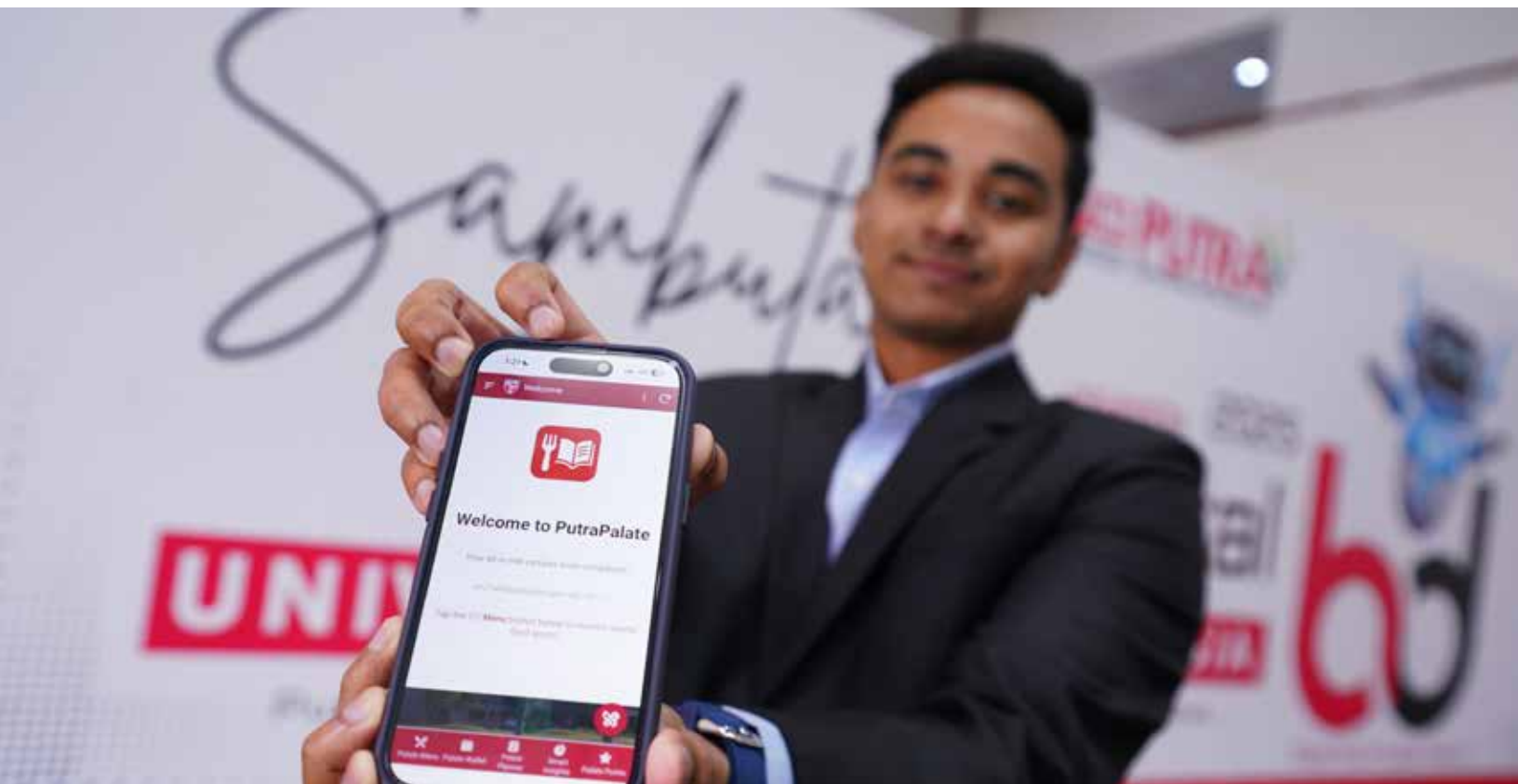
Key Initiatives Indicators

The following indicators provide structured reference points to assess the effectiveness, coherence, and institutional integration of Digitalisation under this Blueprint. They evaluate the extent to which digital infrastructure, data governance, and smart technologies are systematically leveraged to advance planetary health across governance, academic, research, and operational domains.

Digital Infrastructure and Integration

- Establishment of an integrated digital data and reporting system capturing sustainability-related information across PTJs
- Operationalisation of a centralised dashboard enabling consolidated, real-time, and accessible data oversight
- Interoperability between institutional information systems supporting governance and cross-portfolio coordination

These indicators assess whether digital systems are structurally integrated and capable of supporting institution-wide planetary health and sustainability management.



Data Governance and Ethical Digital Practice

- Existence of governance guidelines addressing ethical, responsible, and sustainable digitalisation practices
- Incorporation of data security, privacy protection, and responsible data management principles within planetary health and sustainability reporting systems
- Alignment of digital innovation initiatives with planetary health and sustainability considerations

These measures evaluate whether digital transformation is guided by ethical safeguards and planetary health and sustainability-aligned governance standards.

Smart Monitoring and Operational Optimisation

- Deployment of smart monitoring technologies enabling real-time tracking of resource use, environmental performance, and operational efficiency
- Integration of digital systems into daily operational management and preventive decision-making processes
- Demonstrated use of digital data to inform planetary health and sustainability operations and strategies

These indicators assess the extent to which digitalisation strengthens anticipatory governance and adaptive operational management.

Transparency and Institutional Learning

- Availability of accessible digital platforms communicating planetary health and sustainability performance to all stakeholders
- Periodic review of digital system effectiveness in advancing planetary health and sustainability objectives
- Evidence of continuous performance improvement supported by digital monitoring and analytics systems

These measures evaluate whether digital systems function as instruments of institutional learning and accountability.





ENABLER 4: Financial Resilience

Financial Resilience refers to UPM's capacity to secure, manage, and sustain financial resources in support of planetary health and sustainability over the long term. It emphasises institutional financial structures that enable continuity, adaptability, and strategic investment, rather than reliance on short-term or project-based funding cycles.

Planetary health and sustainability initiatives typically require extended implementation horizons and cross-sector collaboration to respond to uncertainty. Stable and diversified financing mechanisms are therefore essential to ensure credibility, scalability, and sustained institutional commitment. Financial resilience safeguards sustainability priorities from episodic budgetary pressures and short-term fiscal constraints.

At UPM, sustainability-related initiatives are currently supported through a combination of institutional operating budgets, competitive research grants, industry collaborations, philanthropic contributions, and external funding streams. This diversified base reflects the University's established research and innovation capacity. Under the Blueprint, however, financial governance must evolve further to ensure that fiscal management frameworks are systematically aligned with planetary health and sustainability stewardship principles.

This includes aligning procurement policies with planetary health and sustainability standards, embedding long-term environmental and social risk considerations within financial planning, strengthening cost-efficiency through resource optimisation.

Financial Resilience therefore extends beyond conventional budget management. It represents strategic financial stewardship, integrating economic sustainability with ecological responsibility and long-term institutional stability. Through disciplined fiscal governance and diversified funding strategies, UPM reinforces its capacity to sustain planetary health and sustainability commitments while maintaining its operational integrity.

Scope

The scope of Financial Resilience encompasses strengthening UPM's financial governance to support planetary health in a structured and forward-looking manner.

First, it includes ensuring the practice of green procurement within UPM's financial and resource management systems. Procurement decisions influence environmental impact, lifecycle costs, and supply chain responsibility. Embedding planetary health and sustainability criteria within procurement frameworks strengthens alignment between financial decisions and ecological responsibility. Most critically, UPM's financial sustainability and resilience must be secured to ensure that any planetary health and sustainability agenda introduced can be effectively implemented, sustained, and scaled over time.

Second, the scope includes providing dedicated funding allocations to ensure the continuity of planetary health and sustainability initiatives. Strategic investment mechanisms are necessary to ensure long-term projects, infrastructure upgrades, research programmes, and institutional transformation efforts.

Third, it encompasses implementing planetary health and sustainability-driven innovations that contribute to income generation. By leveraging research excellence, innovation ecosystems, and sustainability expertise, UPM can create new revenue streams aligned with planetary health objectives.

Fourth, the scope includes adopting circular economy principles within financial management. Resource efficiency, lifecycle optimisation, waste reduction, and value recapture mechanisms contribute to cost savings and environmental responsibility simultaneously.

Financial Resilience – Scope

- Ensuring the practice of green procurement in UPM's financial operations
- Providing dedicated funding allocations to ensure the continuity of planetary health and sustainability initiatives
- Implementing new innovations based on sustainability initiatives for UPM's income generation
- Adopting circular economy principles in UPM's financial management

Key Initiatives

To operationalise Financial Resilience as a transformational enabler, UPM will transition towards green financing mechanisms by adopting green procurement practices and integrating circular economy principles within financial and resource management systems.

UPM will also strengthen dedicated financial support for planetary health and sustainability through structured allocations and institutional mechanisms that ensure continuity and long-term viability of related initiatives and projects. These mechanisms reduce dependency on short-term funding cycles and reinforce strategic commitment. The University will diversify and innovate green financing sources. Mechanisms such as carbon trading and other sustainability-aligned revenue strategies will be explored to enhance institutional revenue resilience while improving environmental



performance. This may include the establishment of a planetary health and sustainability-based endowment to mobilise long-term philanthropic, industry, and alumni contributions for strategic sustainability initiatives.

Financial Resilience – Key Initiatives

- Transition towards green financing mechanisms by adopting green procurement practices and applying circular economy principles in financial and resource management.
- Strengthen dedicated financial support for planetary health and sustainability through special allocations and mechanisms that ensure the continuity and long-term viability of related initiatives and projects.
- Diversify and innovate green financing sources by exploring mechanisms such as carbon trading to enhance institutional revenue resilience and environmental performance.

Key Initiatives Outcomes

Over time, financial decision-making will consistently reflect stewardship principles. Procurement systems will be aligned with environmental responsibility and lifecycle considerations, while diversified funding mechanisms will enhance institutional adaptability in the face of fiscal uncertainty. Sustainability initiatives will demonstrate continuity, scalability, and transparent fiscal accountability within structured governance frameworks.

Financial planning processes will progressively integrate long-term ecological and social risk assessments, ensuring that institutional investments are aligned with responsible growth trajectories.

The intended outcome is a financially stable institutional environment in which planetary health and sustainability priorities are systematically supported through coherent budgeting, responsible procurement, diversified revenue streams, and innovation-driven financial resilience. Through this framework, fiscal governance becomes an active instrument of planetary stewardship, reinforcing both institutional stability and long-term societal contribution.

Financial Resilience – Key Initiative Outcome

Establish a resilient, sustainable, and future-oriented financial ecosystem that enables long-term investment and impact in planetary health and sustainability at UPM

Key Initiatives Indicators

The following indicators provide structured reference points to assess the effectiveness, coherence, and institutional integration of Financial Resilience under the Blueprint. They evaluate the extent to which financial governance, procurement systems, and revenue strategies are aligned with planetary stewardship and long-term institutional sustainability.

Green Procurement and Sustainable Financial Practices

- Adaptation of green procurement guidelines within institutional financial and procurement frameworks
- Integration of environmental, social, and lifecycle considerations within purchasing and supplier evaluation processes
- Application of circular economy principles in resource allocation, asset management, and financial planning systems

These indicators assess whether fiscal governance is aligned with environmental responsibility and sustainable consumption principles.

Dedicated Funding and Investment Continuity

- Establishment of structured financial allocations supporting planetary health and sustainability initiatives
- Alignment of budget planning processes with medium- and long-term planetary health sustainability priorities
- Existence of continuity mechanisms supporting multi-year sustainability programmes, infrastructure investments, and research initiatives

These measures evaluate whether sustainability commitments are supported by stable and predictable financial frameworks rather than ad hoc allocations.

Revenue Diversification and Sustainability Innovation

- Exploration and implementation of planetary health and sustainability-aligned revenue mechanisms, including carbon trading participation and related instruments
- Integration of planetary health and sustainability-driven innovation into income generation strategies
- Strengthened collaboration with external partners, industry, and funding agencies to support financially sustainable planetary health initiatives

These indicators assess the University's capacity to enhance revenue resilience while reinforcing environmental performance and institutional credibility.

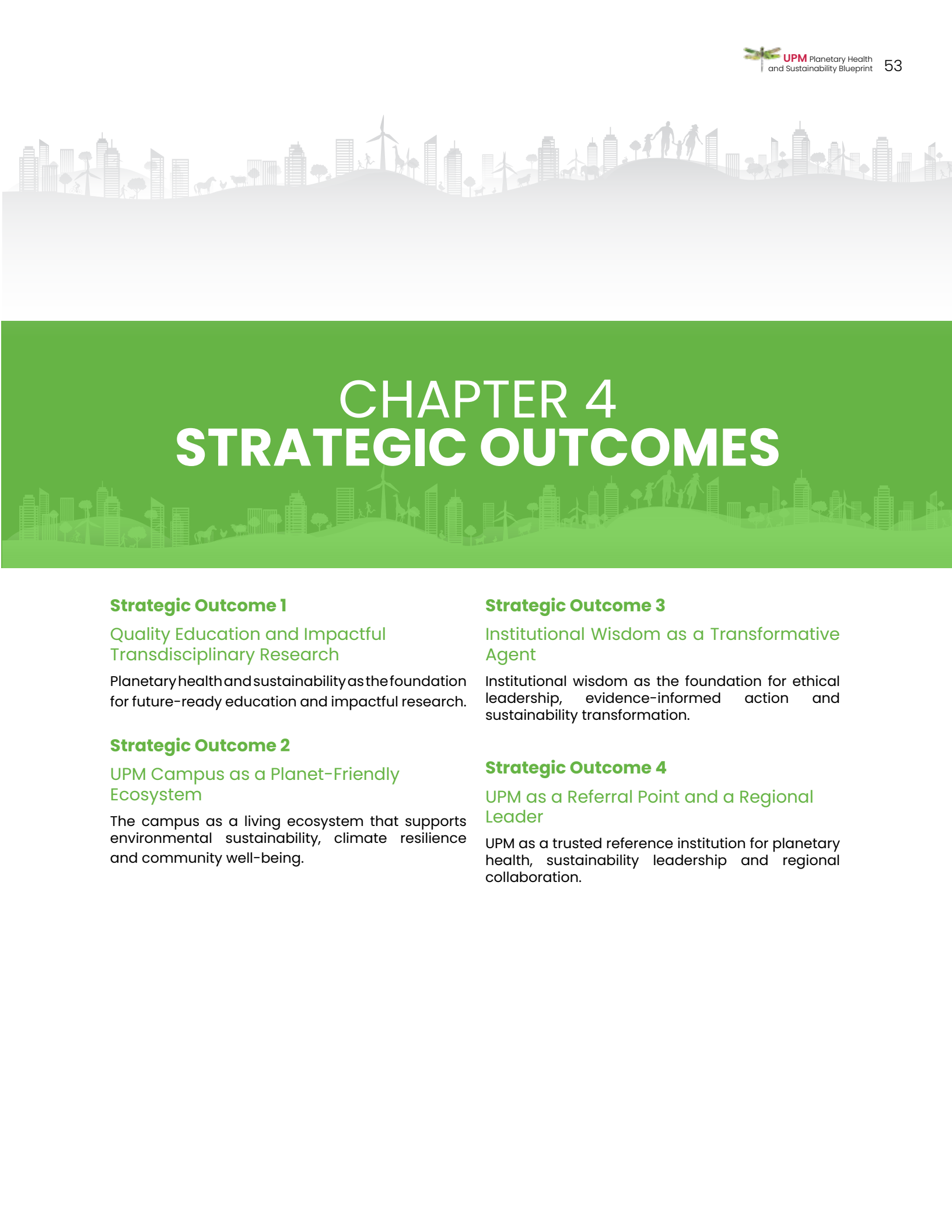
Financial Governance and Accountability

Incorporation of planetary health and sustainability considerations within institutional financial planning, reporting, and risk management systems
Periodic review of financial resilience in relation to planetary health and sustainability commitments
Transparent communication of planetary health and sustainability-related financial commitments and resource allocation priorities

These measures evaluate whether financial systems support transparency, accountability, and long-term strategic oversight.

These indicators signal the maturity of UPM's financial governance in advancing planetary health and sustainability. They distinguish between routine fiscal administration and strategic financial stewardship. By examining procurement alignment, funding continuity, revenue diversification, and accountability mechanisms, this framework ensures that financial resilience functions as a core enabler of long-term planetary health and sustainability transformation. Through this structured assessment approach, financial governance reinforces institutional credibility, adaptive capacity, and enduring impact in planetary health and sustainability.





CHAPTER 4

STRATEGIC OUTCOMES

Strategic Outcome 1

Quality Education and Impactful Transdisciplinary Research

Planetary health and sustainability as the foundation for future-ready education and impactful research.

Strategic Outcome 2

UPM Campus as a Planet-Friendly Ecosystem

The campus as a living ecosystem that supports environmental sustainability, climate resilience and community well-being.

Strategic Outcome 3

Institutional Wisdom as a Transformative Agent

Institutional wisdom as the foundation for ethical leadership, evidence-informed action and sustainability transformation.

Strategic Outcome 4

UPM as a Referral Point and a Regional Leader

UPM as a trusted reference institution for planetary health, sustainability leadership and regional collaboration.



Strategic Outcome 1: Quality Education and Impactful Transdisciplinary Research

Strategic Outcome 1 reflects Universiti Putra Malaysia's commitment to positioning planetary health and sustainability as organising principles across education, research, campus operations, industry and community engagement. Planetary health is understood as an interdisciplinary field that examines how the integrity of Earth's natural system conditions human health and well-being, recognising that human civilisation depends on stable climate systems, functioning ecosystems, and equitable social structures.

Operationally, Strategic Outcome 1 advances UPM's transition into a fourth-generation university, where humanistic values, planetary health, and sustainability inform all institutional decisions and practices. Mission-oriented, transdisciplinary research responds directly to societal challenges, while education, innovation, and community engagement are deliberately integrated rather than functioning as separate domains. This transformation centers on three core, interlinked strategic initiatives for growth and excellence: (i) Education, which focuses on modernising the curriculum, leveraging technology, and emphasising experiential and interdisciplinary learning to enhance global competitiveness; (ii) Research, which seeks to increase the volume, quality, and societal impact of scholarly output by fostering inquiry, securing external funding, and advancing strategic areas for groundbreaking discoveries; and (iii) Integration of Research and Education, which aims to synergise research and

education to enrich the student experience, inform the curriculum with leading edge findings, and accelerate discovery. These three initiatives drive our evolution toward academic leadership and societal contribution.

The strategy operationalises Malaysia's National Planetary Health Action Plan (NPHAP), especially Key Result Areas 3 (Sustainable Food Systems) and 4 (Research and Education). It aligns with global frameworks, including the Sustainable Development Goals (SDGs), the Planetary Health Alliance education framework, and UNESCO's Education for Sustainable Development competencies. UPM's strength in tropical agriculture, food security, environmental science, and One Health positions the university to focus particularly on food systems as a key proximate cause connecting environmental change to health outcomes.



Strategic Outcome 1 has three objectives:

1. To ensure all UPM learners (students at all levels) and educators (faculty and instructors) attain the eight Education for Sustainable Development competencies aligned with UPM Program Learning Outcome (PLO), transforming academic programs through multidimensional curriculum integration and producing future-proofed graduates equipped with the knowledge, skills, and values to address complex planetary health challenges.
2. To position UPM as the Respected, Referred, and Relevant (3R) focal point for planetary health and sustainability research in Malaysia and globally, particularly in sustainable food systems, generating high-impact scholarship that advances global knowledge, informs national policy, and delivers practical solutions to communities.
3. To demonstrate a replicable fourth-generation university model where education and research are seamlessly integrated through campus living laboratories, student-led research initiatives, and community partnerships, showing that planetary health and sustainability can serve as the organising principle for institutional transformation, delivering measurable outcomes in carbon neutrality, research-education synergy, and community impact.

The current planetary health crisis is characterised by accelerating climate change, biodiversity loss, ecosystem degradation, and widening health inequities. Malaysia is acutely exposed due to its tropical geography, dependence on climate-sensitive sectors such as agriculture, and rapid urbanisation. Rising temperatures and increased frequency of heatwaves threaten agricultural productivity, including documented heat-related reductions in rice yields. Intensifying floods, droughts, and shifts in monsoon patterns disrupt food production, damage infrastructure, displace communities, and increase the risk of vector-borne diseases such as dengue and malaria.

Deforestation and land conversion for commodities, including palm oil have contributed to substantial loss of forest cover and associated biodiversity, undermining ecosystem services such as carbon sequestration, soil conservation, water regulation, and flood mitigation. These environmental changes translate into health impacts through multiple proximate pathways, including degraded air quality from agricultural burning and urban pollution; harmful substances in food and water from pesticides and industrial contaminants; compromised food quantity and quality; climate-induced migration; expanding habitats for disease vectors; heightened exposure to natural hazards; stressed freshwater systems; and declining access to restorative natural environments.

Universities hold distinctive responsibilities and capacities in this context. As generators of knowledge and conveners of diverse stakeholders, they can help design, test, and scale systems-level responses to planetary health threats. Strategic Outcome 1 positions UPM to respond systematically to Malaysia's vulnerability by equipping graduates with relevant competencies, mobilising research to inform policy and practice, and demonstrating institution-wide sustainable practices that can be adapted nationally and regionally.

The significance of this strategy lies in its linkage of national resilience to planetary health. Food security, public health, economic stability, and social cohesion in Malaysia depend on successfully navigating this crisis. UPM, as a leading public research university, is expected to contribute evidence, drive innovation, strengthen capacity building, influence policy, enhance partnerships, and deliver measurable societal and environmental impact.



Operationalising National Policy Mandates: From Vision to Action

Malaysia has articulated strong commitments to planetary health and sustainability through the NPHAP and related policy frameworks. However, the translation of these national visions into institutional practice within higher education remains uneven. Strategic Outcome 1 matters because it offers a structured and evidence-informed model for operationalising planetary health and sustainability across university functions.

NPHAP's call for transdisciplinary research hubs is operationalised through Strategic Outcome 1's research coordination mechanism. Rather than creating new silos, this approach offers conceptual, coordination, and capacity-building support to existing University-Driven Research Programmes (UDRPs) and PTJ-Driven Research Programmes (PDRPs), ensuring their contributions to planetary health are explicit, coherent, and strategically aligned. Defined funding trajectories and governance arrangements support sustained implementation.

Therefore, Strategic Outcome 1 provides an institutional pathway for turning national planetary health mandates into measurable outcomes. Its successful implementation will offer a model for other Malaysian universities, accelerating system-wide progress and enhancing the credibility of national commitments.



Leveraging UPM's Unique Food Security Niche: From Proximate Cause to Solution

Food systems occupy a central position in planetary health frameworks as both a driver of environmental degradation and a determinant of human health. Unsustainable agricultural practices contribute to greenhouse gas emissions, biodiversity loss, water pollution, and soil degradation, while also undermining nutrition security and increasing exposure to harmful substances. Malaysia's dependence on food imports, combined with climate vulnerability, presents risks to the affordability, availability, and stability of food supplies. Simultaneously, dietary shifts towards ultra-processed foods contribute to rising rates of obesity and non-communicable diseases.

UPM is uniquely positioned to address these challenges. The UPM Food Security Blueprint (2025–2035) sets out an agenda for regenerative agriculture, climate-smart technologies, digital innovation, and circular food systems. UPM's faculties collectively cover the entire food system: encompassing crop and soil sciences, livestock and veterinary health, food processing and safety, forestry and ecosystem management, as well as engineering solutions, economics, policy, and community nutrition.

Strategic Outcome 1 matters because it explicitly mobilises this breadth of expertise through a coherent planetary health lens. The sustainable food systems research agenda coordinates work across various thematic areas, including regenerative agriculture, climate-smart technologies, digital and precision agriculture, and circular economy approach to food waste. This integrated research agenda addresses several proximate causes of planetary health simultaneously: reducing dependence on harmful agrochemicals, enhancing the quality and stability of food supplies, protecting freshwater resources, and sustaining ecosystem services.

By coupling research with education and community engagement, UPM can demonstrate food system interventions that deliver co-benefits for human health, environmental integrity, and rural livelihoods. This positions UPM as a national reference point for sustainable food systems, ensuring that advances in agricultural science translate into tangible improvements in planetary health outcomes.





Preparing Future-Ready Graduates: Competencies for an Uncertain World

The next generation of graduates will work in an environment marked by climatic instability, resource constraints, technological disruption, and shifting disease patterns. Traditional disciplinary curricula that primarily transmit static knowledge are insufficient for these conditions. Strategic Outcome 1 is significant because it redefines the purpose of university education to focus on competency development in the face of complexity, uncertainty, and rapid change.

The eight Education for Sustainable Development competencies aligned with PLO12, namely systems thinking, anticipatory, normative, strategic, collaborative, critical thinking, self-awareness, and integrated problem solving, together constitute a comprehensive capability set for future professionals. These competencies move beyond technical skills to encompass ethical reasoning, reflexivity, and the capacity to work across disciplinary and sectoral boundaries

The 8 Core Competencies for Sustainability

A Future-Proof Framework for a Changing World (UNESCO, 2017)



KEY INSIGHT

- ✓ SDGs are the WHAT (Goals change). ESD Competencies are the HOW (Skills endure).
- ✓ Equipping learners to navigate uncertainty and drive transformative change.

The 8 Education for Sustainable Development Competencies (ESDC).

The Eight Education for Sustainable Development Competencies comprise systems thinking, anticipatory, normative, strategic, collaborative, critical thinking, self-awareness, and integrated problem-solving competencies, which collectively equip learners to address complex sustainability and planetary health challenges.

Labour market evidence indicates growing employer demand for sustainability literacy and systems thinking capabilities. Strategic Outcome 1 addresses this demand, ensuring that UPM graduates are not only technically competent but also equipped to contribute to institutional and societal transformations. This enhances graduate employability while fulfilling UPM's broader mandate to contribute to national development and global public goods.

Current Scenario

UPM has established several foundational elements that support the integration of planetary health and sustainability into core functions. These foundations provide a strong platform for Strategic Outcome 1 while also revealing critical gaps that require attention.

First, UPM's SULAM (Service-Learning Malaysia – University for Society) represents a mature transversal integration mechanism, with more than 15 years of institution-wide implementation. SULAM embeds community-engaged learning into curricula across all faculties, requiring students to undertake projects that address real community needs, including agricultural extension, health promotion, environmental conservation, and urban social initiatives. Grounded in experiential learning and critical pedagogy, SULAM offers a robust platform for embedding planetary health themes in ways that connect learning to societal challenges. However, SULAM has not yet been systematically framed in terms of planetary health and sustainability competencies, limiting its potential to contribute directly to PLO12. To strengthen the alignment between academic programmes and national as well as global sustainability agendas, UPM has elevated the role of Programme Learning Outcomes (PLOs) in guiding curriculum transformation. UPM's PLO12, endorsed through Senate Meeting 740 and elaborated in the 2025 Curriculum Guidelines, mandates the development of Education for Sustainable Development competencies in all programmes. Strategic Outcome 1 moves this from compliance to genuine transformation by clarifying how each competency is cultivated through the four integration mechanisms and creating governance and accountability structures.

Second, UPM has already institutionalised PLO12 through Senate policy and the *Garis Panduan Penawaran Program Akademik Baharu dan Semakan Kurikulum (Edisi 2025)*, which requires the structured embedding of Education for Sustainable Development content in all academic programmes. The guidelines specify minimum thresholds for courses contributing to ESD

competencies per semester. While some faculties have responded with comprehensive curriculum revisions, implementation remains uneven, and in some instances, PLO12 is addressed through stand-alone sustainability courses rather than holistic redesign.

Third, UPM possesses significant research strengths relevant to planetary health, particularly in agriculture, food security, environmental science, forestry, and One Health. Institutes such as the Institute of Tropical Agriculture and Food Security (ITAFoS), Institute of Bioscience (IBS), Institute of Tropical Forestry and Forest Products (INTROP), and International Institute of Aquaculture and Aquatic Sciences (I-AQUAS) conduct research directly relevant to climate-smart agriculture, biodiversity conservation, ecosystem services, and zoonotic diseases. This research base provides substantial content for integration into teaching and for alignment with planetary health frameworks.





Critical gaps and challenges

Despite these strengths, Strategic Outcome 1 addresses several growth opportunities. While planetary health and sustainability content is well-established in certain programmes, there is potential to expand integration more systematically across the full breadth of UPM's academic offerings, ensuring that all graduates gain meaningful exposure to these critical issues and can contribute to whole-of-society transformation.

Opportunities exist to strengthen mechanisms for cross-faculty collaboration, enabling greater student mobility and the development of joint, interfaculty learning experiences that cultivate the transdisciplinary competencies essential for addressing complex challenges. Campus operational initiatives in energy, waste, water, and biodiversity offer promising foundations that can be more fully integrated into teaching and research as systematic living laboratories, creating rich learning environments for students and researchers alike. These efforts should also be linked to learning outcome attainment and aligned with Programme Educational Outcome targets, particularly in preparing graduates to act responsibly as nation builders and custodians of the Earth.

Research funding for planetary health-related work presents opportunities for greater coordination. While UPM conducts strong research across diverse disciplines, there is scope to more systematically apply a planetary health and sustainability lens to existing research portfolios, enabling researchers to articulate how their work contributes to environmental drivers, health outcomes, and societal resilience.

Finally, UPM has the opportunity to advance toward the fourth-generation university (4GU) model, a global trend in higher education where institutions actively drive regional economic development and societal transformation through deep stakeholder engagement, multidirectional knowledge transfer, and entrepreneurial collaboration with industry, government, and communities. This evolution positions UPM not only as a centre of academic excellence but as a dynamic partner in addressing the sustainability challenges of our time, contributing meaningfully to regional competitiveness and societal well-being.

What is the global 4GU movement?

The fourth-generation university (4GU) model represents an evolution in higher education's role in society. First-generation universities focused on teaching, second-generation added research, and third-generation integrated commercialisation and technology transfer. Fourth-generation universities go further by actively driving regional economic development and societal transformation through deep, multidirectional engagement with external stakeholders. Key characteristics include maintaining strong relationships with industry, government, and community; functioning as innovation hubs embedded in local ecosystems; facilitating dynamic knowledge flows in all directions (not just from university outward); and integrating teaching, research, and commercialisation to produce tangible societal and economic impact. This model positions universities as proactive agents of regional competitiveness and sustainability.



The Fourth-Generation University (4GU) as an Evolving Global Model of Higher Education. The Fourth-Generation University (4GU) represents an evolutionary progression in the role of higher education institutions within society. While first-generation universities focused primarily on teaching, second-generation institutions incorporated research as a core function, and third-generation universities integrated commercialisation and technology transfer, the 4GU model extends beyond these functions to actively shape regional economic development and societal transformation.

Key Initiatives

Initiative 1 Multidimensional Integration of Planetary Health and Sustainability Across All Programmes

Initiative 1 embeds planetary health and sustainability systematically throughout UPM's academic offerings using four complementary integration mechanisms, supported by targeted revision of *Mata Pelajaran Umum (MPU)* courses. Initiative 1 integrates planetary health and sustainability across all programmes through four complementary mechanisms. The longitudinal mechanism ensures progressive development of the eight ESD competencies across semesters, equipping graduates with foundational competencies to face global sustainability challenges in their future careers and daily lives. The

lateral mechanism expands access through cross-faculty open electives and flexible learning options, including micro credentials, summer programmes, and Continuing Professional Development offerings delivered face-to-face, hybrid, and online to maximise participation. The transversal mechanism embeds planetary health themes into co-curricular, experiential, and community-based learning, with SULAM projects aligned to planetary health priorities and campus living laboratories serving as applied learning sites. The convergent mechanism creates interfaculty capstones and collaborative projects where students from



multiple disciplines work with external partners to address complex planetary health problems, cultivating collaboration and integrated problem-solving competencies. A critical sub-component is the systematic revision of *MPU* courses to integrate planetary health content, ensuring universal baseline literacy. Together, these mechanisms produce graduates who demonstrate universal attainment of PLO12, with substantial cross-faculty enrolment, widespread programme integration, and significant participation from both students and working professionals in flexible learning pathways.

Initiative 2 Advancing Research Through a Planetary Health and Sustainability Lens

The second initiative advances university-wide research by embedding a planetary health and sustainability lens across all UPM research programmes. The initiative operates as a conceptual, coordination, and capacity-building mechanism that enables researchers to frame their work within planetary health paradigms without replacing existing UDRP and PDRP structures. It supports researchers in articulating their contributions to planetary health outcomes and in identifying synergies for multidisciplinary collaboration. The initiative applies five interconnected conceptual facets to guide research framing and methodology: Anthropocene and Health, which examines how human-driven environmental change affects health; Movement Building and Systems Change, which mobilises coalitions for collective action; Systems Thinking and Complexity, which applies systems science to understand interconnected challenges; Equity and Social Justice, which centres the needs of marginalised populations; and Interconnection Within Nature, which recognises that human well-being depends on ecological balance. Together, these facets provide analytical tools for shaping research questions while enabling systematic mapping of UPM's research portfolio to eight planetary health proximate causes. Core



components of the initiative include a structured researcher development pathway, cross-UDRP knowledge exchange forums, an annual Planetary Health Research Symposium, and a dedicated coordination mechanism to support multidisciplinary grant development and policy brief production. Through these components, the initiative strengthens research coherence, accelerates proposal incubation, and enhances translation of scientific outputs into policy-relevant insights. This initiative is expected to drive substantial growth in external research funding, increase publication output, and strengthen policy engagement, aligning with national planetary health priorities. Collectively, the initiative institutionalises the application of a planetary health and sustainability lens to transdisciplinary research, amplifies societal impact, and positions UPM as a Respected, Referred, and Relevant focal point for planetary health and sustainability research.



Initiative 3 Advancing UPM as a Fourth-Generation University (4GU) through Research-Education Integration for Planetary Health and Sustainability

Initiative 3 transforms UPM into a fourth-generation university (4GU), a global model of higher education where planetary health and sustainability objectives are advanced through the seamless integration of teaching, research, commercialisation, and deep stakeholder engagement. This model moves beyond the traditional roles of teaching (first generation), research (second generation), and commercialisation (third generation) to actively drive regional economic development and societal transformation through multidirectional knowledge transfer and entrepreneurial engagement with industry, government, and community partners. This is operationalised through several interconnected mechanisms. The campus living laboratory and 4GU integration mechanism establish the campus as a platform for co-creation with external partners, where demonstration sites for regenerative agriculture or renewable energy serve as shared research and teaching spaces. This platform enables the integration of research, industry, and teaching, where joint projects with

industry are embedded into the curriculum, creating innovation-driven learning experiences. This deep collaboration is further advanced through the multi-stakeholder engagement for the societal transformation mechanism, which facilitates co-created research with industry, government, and community partners to address regional needs like sustainable food systems and climate adaptation. Finally, the entrepreneurship and innovation mechanism connects these research outcomes to enterprise development through incubation programs and seed funding, translating knowledge into commercial and social solutions. Collectively, these mechanisms position UPM within the global 4GU movement, establishing it as an ASEAN leader and an innovation hub deeply embedded in its local ecosystem, driving societal transformation and regional competitiveness while maintaining academic excellence.



Key Initiative outcomes

Outcome 1 Future-Ready Graduates Equipped for Planetary Health Challenges

Through the multidimensional integration of planetary health and sustainability across all academic programmes, UPM cultivates graduates who combine disciplinary excellence with adaptive capacity, ethical grounding, and practical competence to address complex and interdependent global challenges. Curriculum transformation ensures that planetary health principles are not confined to specialised courses but embedded across teaching, assessment, experiential learning, and professional preparation pathways. All graduates demonstrate the Education for Sustainable Development competencies aligned with Programme Learning Outcome 12 through authentic assessments, reflective portfolios, capstone projects, community-engaged learning, and research-informed problem solving.

Learning experiences increasingly connect classroom knowledge to real-world applications, including regenerative agriculture, climate adaptation planning, circular-economy innovation, One Health initiatives, sustainable food systems, and community-resilience programmes. Cross-faculty learning pathways and flexible credentials foster interdisciplinary exposure and lifelong learning habits, with microcredentials, professional certifications, and modular courses enabling both students and working professionals to strengthen planetary health literacy. Faculty development strengthens pedagogical innovation, equipping educators with transdisciplinary teaching approaches and systems-oriented methodologies. Collectively, these outcomes position UPM graduates as future-ready leaders capable of designing, implementing, and evaluating transformative solutions to climate disruption, food insecurity, biodiversity decline, and health crises, while upholding ethical responsibility and societal stewardship.

Outcome 2 Researchers Practise Planetary-Friendly Living – Sustainability as an Institutional Ethos

UPM establishes a coordinated and conceptually grounded research ecosystem that enables all UDRPs and PDRPs to position their work within planetary health frameworks without altering existing structures. The hub strengthens researcher participation in planetary health training and transdisciplinary capacity-building programmes, equipping scholars with systems thinking approaches, equity-informed methodologies, and science-policy communication skills. Regular cross-UDRP forums foster collaborative research initiatives across multiple disciplines, encouraging integrated grant applications and shared problem framing around the Anthropocene, systems change, social justice, and interconnection within nature. Research portfolios are progressively mapped to planetary health proximate causes, strengthening conceptual clarity and strategic coherence.

Publication outputs increasingly articulate planetary health framing, while multi-disciplinary projects enhance methodological integration and societal relevance. The annual symposium and structured stakeholder dialogues enhance engagement with government, industry, civil society, and international networks, contributing to growing recognition and visibility of UPM's planetary health research. Collectively, these developments position UPM as a respected and referred hub for planetary health scholarship, with strengthened funding performance, coordinated research platforms, and expanding influence in national and regional policy ecosystems.

Outcome 3 UPM as the Respected, Referred, and Relevant (3R) Focal Institution for Planetary Health and Sustainability

Through the Fourth-Generation University (4GU) model, UPM becomes an innovation hub where teaching, research, commercialisation, and stakeholder engagement operate as an integrated ecosystem advancing planetary health and sustainability. The campus functions as a living laboratory guided by a 4GU Master Plan, embedding real-world demonstration sites into curricula and research while strengthening multidirectional knowledge transfer between the university, industry, government, and community stakeholders. Integration of teaching, research, and commercialisation enables innovation-driven learning, where industry collaboration, entrepreneurial pathways, and applied research projects contribute directly to regional economic development. Students and researchers engage in

co-created initiatives addressing sustainable food systems, climate adaptation, renewable energy, and circular economy development, ensuring deep stakeholder involvement and entrepreneurial engagement within the local ecosystem. Structured partnerships and joint research platforms demonstrate dynamic knowledge exchange, while incubation and innovation support mechanisms translate research into commercial and social solutions. The documentation and dissemination of the 4GU model for societal transformation further position UPM as a reference institution within ASEAN. Collectively, these developments establish UPM as a Respected, Referred, and Relevant focal institution embedded within its regional ecosystem and actively driving sustainable development.





Key Initiatives indicators

Key initiative outcome 1

Future-Ready Graduates Equipped for Planetary Health Challenges

This outcome reflects the transformation of UPM's educational ecosystem to ensure that all graduates possess the knowledge, competencies, and ethical grounding necessary to respond to complex planetary health challenges. Academic programmes progressively integrate planetary health and sustainability learning outcomes within Programme Learning Outcomes and curriculum structures, ensuring that sustainability literacy and ESDCs are developed across disciplines rather than confined to specialised programmes. Students are actively engaged in experiential learning activities that connect theory with practice, including community projects, SULAM initiatives, field-based learning, campus living laboratories, and interdisciplinary capstone projects. Through these experiences, students cultivate the ability to analyse interconnected environmental, social, and health challenges while developing practical solutions that contribute to sustainable development and societal well-being.

Key initiative outcome 2

Researchers Practise Planetary-Friendly Living – Sustainability as an Institutional Ethos

This outcome strengthens UPM's research ecosystem by embedding planetary health and sustainability principles across research culture, methodologies, and collaborations. Researchers increasingly participate in structured training and capacity-building programmes that enhance their ability to apply systems thinking, transdisciplinary approaches, and sustainability frameworks in their scholarly work. Collaborative research initiatives expand across University Driven Research Programmes and disciplines, enabling integrated responses to complex challenges such as food security, climate adaptation, ecosystem resilience,

and human health. As these efforts grow, UPM's research contributions gain increasing recognition and visibility within international networks, policy dialogues, and global scientific communities, positioning the university as an influential contributor to planetary health scholarship and solutions.

Key initiative outcome 3

UPM as the Respected, Referred, Relevant (3R) Focal Institution for Planetary Health and Sustainability

Through the advancement of a fourth-generation university model, UPM evolves into a dynamic innovation hub where education, research, commercialisation, and societal engagement operate as an integrated ecosystem. Multidirectional knowledge exchange strengthens partnerships between the university, industry, government, and community stakeholders, enabling collaborative problem solving and shared innovation. Teaching, research, and commercialisation activities increasingly converge to generate solutions that support regional economic development, environmental sustainability, and community resilience. Deep stakeholder engagement fosters entrepreneurial initiatives, applied research, and co-created projects addressing real-world sustainability challenges. The systematic documentation and dissemination of this model further positions UPM as a respected and referred reference institution within Malaysia and the ASEAN region, demonstrating how universities can drive societal transformation through planetary health and sustainability principles.

Key Action Plan

Initiative 1 Integrate Planetary Health and Sustainability Across All Programmes

The University will institutionalise a multidimensional approach encompassing longitudinal, lateral, transversal, and convergent integration to embed planetary health and sustainability across all academic programmes and develop future ready graduates equipped to address planetary health challenges. The action plan will strengthen governance and curriculum oversight mechanisms and complete a comprehensive curriculum gap analysis across all programmes. Programme Learning Outcome 12, aligned with the eight Education for Sustainable Development competencies, will anchor longitudinal integration. The University will standardise curriculum mapping tools, assessment rubrics, and quality assurance templates to ensure consistency and academic rigour across all programmes.

Longitudinal integration will ensure progressive development of Education for Sustainable Development competencies across semesters within each programme. Undergraduate programmes will integrate at least two ESD focused courses per semester, while diploma and postgraduate programmes will integrate at least one. Curriculum mapping will systematically develop competencies in systems thinking, anticipatory, normative, strategic, collaboration, critical thinking, self-awareness, and integrated problem solving. Lateral integration will expand access to planetary health content through PRT2009, cross faculty open electives, and modular offerings including degree courses, micro credentials, summer programmes, and continuing professional development. Each faculty will contribute contextualised planetary health and sustainability electives open to all students, delivered through face to face, hybrid, and fully online formats to maximise flexibility and widen participation.





Transversal integration will embed planetary health themes into experiential and community-based learning. SULAM projects will be systematically aligned with planetary health priorities, while campus living laboratories such as regenerative agriculture plots, solar farms, biodiversity corridors, and zero waste zones will serve as applied learning sites. Co-curricular initiatives including sustainability leadership programmes and innovation challenges will extend competency development beyond formal coursework. Convergent integration will create interfaculty academic programmes, capstones, grand challenge studios, and collaborative projects where students from multiple disciplines work with external partners to address complex planetary health challenges such as sustainable food systems, cultivating collaboration and integrated problem-solving competencies that cannot be achieved within single programmes alone.

In parallel, the University will institutionalise a structured faculty development and capacity building programme. Faculty across all disciplines

will receive phased training in Education for Sustainable Development, systems thinking, transdisciplinary pedagogy, experiential learning design, and community engaged scholarship. Advanced workshops will strengthen research informed teaching, integrate living laboratory platforms into coursework, and advance authentic assessment strategies such as capstone studios and portfolio-based evaluation. A mentorship model will pair experienced faculty with emerging educators to sustain capacity building and teaching excellence.

Collectively, these actions will increase the proportion of academic programmes with mapped planetary health learning outcomes and expand student participation in experiential learning. By embedding planetary health through governance, curriculum design, pedagogy, and flexible learning pathways, this initiative will institutionalise curriculum transformation and position all UPM graduates to contribute meaningfully to whole of society sustainability transitions.

Initiative 2 Establish PUTRA-KHAZANAH as an Integrative Research Platform

The University will establish PUTRA-KHAZANAH (Knowledge Hub in Advanced Research for the Actualisation of Nature-Positive Approaches in Planetary Health) as a university wide initiative to coordinate research, build capacity, and align priorities through the systematic application of a planetary health and sustainability lens across all UPM research programmes, without altering existing UDRP and PDRP structures. PUTRA-KHAZANAH will enable researchers across all disciplines to frame their work within integrated planetary health paradigms, articulate contributions to societal outcomes, and identify opportunities for transdisciplinary collaboration.

PUTRA-KHAZANAH will apply five interconnected conceptual facets as analytical lenses for all research domains, namely Anthropocene and Health, Movement Building and Systems Change, Systems Thinking and Complexity, Equity and Social Justice, and Interconnection Within Nature. Together, these lenses will guide research framing and methodology while enabling systematic mapping of UPM's research portfolio to eight planetary health proximate causes. This approach will clarify thematic strengths, identify gaps, and surface opportunities for multidisciplinary collaboration, thereby informing strategic funding priorities and targeted support for large scale grant applications.

To operationalise this initiative, the University will establish a strategically positioned Coordination Unit to map research portfolios against the five conceptual facets and eight proximate causes, strengthening research coherence and proposal development. The University will introduce a structured researcher development pathway, beginning with foundational workshops on planetary health frameworks and progressing to advanced training in transdisciplinary methods, stakeholder co creation, and science policy communication. These programmes will cultivate a critical mass of researchers capable of positioning their work within planetary health paradigms

and translating findings into policy relevant outputs. Cross UDRP forums will provide structured platforms for knowledge exchange, proposal incubation, and identification of methodological complementarities.

The University will institutionalise an annual PlanetaryHealthResearchSymposium to strengthen research visibility and stakeholder engagement, convening ministries, industry, civil society, and international partners. Support mechanisms for multi UDRP grant development, policy brief production, and strategic communication will be activated to ensure that research outputs achieve both academic excellence and societal relevance. Over time, PUTRA-KHAZANAH will function as an integrative backbone to drive research coherence, funding growth, and policy impact, positioning UPM as a national reference point for planetary health research.

Initiative 3 Advance UPM as a Fourth Generation University

The University will advance UPM as a Fourth Generation University by embedding research education integration, innovation, and stakeholder collaboration within campus operations and regional ecosystems. The campus will be established as a living laboratory integrating teaching, research, and external partnerships, supported by baseline sustainability audits and the development of a 4GU Master Plan. Priority demonstration sites across energy, agriculture, biodiversity, waste management, and water stewardship will be formalised to support applied learning and co-designed interventions with industry and community partners.

To strengthen innovation driven learning, the University will develop frameworks for joint research with industry partners embedded directly within academic programmes and will establish entrepreneurial teaching learning pathways. Commercialisation pathways and incubation mechanisms will be integrated across programmes, enabling students and researchers to participate in applied problem solving, experiential



learning, and research informed coursework, and to develop prototypes, policy solutions, and social or commercial enterprises aligned with planetary health objectives.

UPM will operationalise multidirectional knowledge transfer through structured engagement with industry, government, and community stakeholders. Pilot partnerships will be launched to co create research and innovation initiatives, followed by expanded student and faculty participation in joint projects. Entrepreneurial support mechanisms including mentorship and seed funding will strengthen pathways from research to impact, while annual reporting will document progress in institutional transformation.

As implementation matures, UPM will scale multi stakeholder engagement into a comprehensive ecosystem that drives regional economic development and societal transformation. Community level outcomes will be captured through impact assessments, case studies, and performance metrics linked to carbon management, resource efficiency, and ecosystem restoration. Collectively, these efforts will position UPM as a model Fourth Generation University, integrating teaching, research, industry collaboration, and societal engagement into a cohesive innovation ecosystem and enabling dissemination of the 4GU approach across ASEAN.



Second Education for Sustainable Development Taskforce Workshop – Benchmarking with Sunway University

The second Education for Sustainable Development (ESD) Taskforce workshop focused on benchmarking institutional practices with Sunway University, examining curriculum integration models, governance mechanisms, and implementation strategies for embedding sustainability across academic programmes. The workshop facilitated comparative learning and informed refinement of UPM's multidimensional integration framework under Strategic Outcome 1.

SULAM Programme on Plastic Waste Management and Recycling – “Zero Plastic Hero by ChemE”

The SULAM (Service Learning Malaysia – University for Society) programme titled “Zero Plastic Hero by ChemE”, conducted under the course Engineer and Society (ENG 3104), was held at SMK Convent (M) Kajang on 16 June 2024. The initiative focused on plastic waste management and recycling awareness, exposing school students to concepts of plastic recycling, waste segregation, collection methods, and the processes involved in recycling systems, while highlighting the economic value of recycled plastics and their potential for sustainable enterprise development. The programme aligns with the Sustainable Development Goals, particularly Quality Education (SDG 4), Responsible Consumption and Production



(SDG 12), Climate Action (SDG 13), Life Below Water (SDG 14), and Life on Land (SDG 15), demonstrating how SULAM integrates academic learning with community engagement to promote environmental responsibility and innovative solutions to plastic pollution.



Suggested Roadmap

Key Initiative	Intended 10 Year Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Consolidation 2032 to 2035
K1. Multidimensional Integration of Planetary Health and Sustainability Across All Programmes	Future ready graduates equipped with planetary health and sustainability competencies across all disciplines.	Integrate Planetary Health and Sustainability Across All Programmes	Establish governance mechanisms; complete curriculum gap analysis; initiate faculty training; design cross faculty learning pathways and flexible credential structures.	Scale curriculum integration across faculties; strengthen advanced pedagogical training; expand student participation in experiential, community based, and flexible learning pathways.	Institutionalise mature curriculum models, mentorship systems, and continuous quality assurance; share UPM's educational framework and best practices with regional and international higher education partners.
K2. Advancing Research Through a Planetary Health and Sustainability Lens	A coordinated research ecosystem that positions UPM as a recognised focal institution for planetary health scholarship, funding, and policy relevance.	Establish PUTRA KHAZANAH as an Integrative Research Platform	Establish PUTRA KHAZANAH and its coordination function; map existing research portfolios; launch researcher training workshops; initiate cross UDRP forums and the annual Planetary Health Research Symposium.	Expand multidisciplinary research collaborations; support multi UDRP grant development; sustain research forums and symposia; increase policy relevant outputs and strategic stakeholder engagement.	Consolidate UPM's role as a regional planetary health research hub through international partnerships, high impact outputs, recognised policy influence, and stronger visibility in global networks.
K3. Advancing UPM as a Fourth Generation University Through Research, Education, and Societal Integration	UPM becomes a Respected, Referred, and Relevant focal institution that demonstrates the 4GU model through integrated teaching, research, innovation, and stakeholder engagement.	Integrate Planetary Health and Sustainability Across All Programmes	Develop the 4GU Master Plan; conduct baseline sustainability audits; formalise campus living laboratories and priority demonstration sites; initiate pilot partnerships with industry, government, and communities.	Scale integrated teaching, research, and industry collaboration models; strengthen innovation and incubation mechanisms; expand student and faculty participation in co created projects; publish annual progress reports.	Demonstrate documented regional and community level impact; establish UPM as an ASEAN reference model for the 4GU approach; disseminate the model to other institutions and strategic partners.

Strategic Outcome 2: UPM Campus as a Planet-Friendly Ecosystem

UPM's vision of a planet-friendly campus positions the university as a living ecosystem that actively nurtures environmental sustainability and human well-being through integrated, evidence-informed, and future-proof practices. Operationally, it encompasses systematic transformation of campus operations, physical landscapes, resource systems, and community cultures to support planetary health principles. Holistically, this transformation reduces ecological burdens, enhances environmental quality, and cultivates a resilient, inclusive, and thriving campus community. It recognises the interdependence of natural systems (water, air, soil, biodiversity), infrastructure (buildings, mobility, energy), and social systems (culture, health, safety, and community cohesion) that collectively shape the lived experiences of students, staff, and surrounding communities.

The strategy strengthens waste reduction and circular resource use, accelerates renewable energy adoption and efficiency improvements, and enhances environmental quality through restoration and nature-based solutions. Through integrated planning of university resources and green infrastructure, biodiversity, microclimate resilience, and responsible human-wildlife coexistence are enhanced. This is supported by the deployment of sustainable food systems through safe sourcing, circular bioresource linkages, and climate-smart practices. This culminates in developing a planet-friendly ecosystem for the people, enriched by healthy and sustainable lifestyles through inclusive wellness programmes and incentive mechanisms. At the same time, mobility systems are redesigned to prioritise safety, accessibility, and support low-emission transport.

Collectively, these coordinated actions transform UPM into a regenerative, low-carbon, and climate-adaptive campus that models planetary health in practice. It positions the university as a microcosm of sustainable development where research, teaching, governance, and operations converge

to demonstrate scalable solutions for ecological integrity, community resilience, and human flourishing

Transforming UPM into a planet-friendly ecosystem for sustainability and well-being is not only an institutional aspiration but an urgent strategic necessity shaped by environmental realities, societal expectations, and UPM's long-standing identity as a land-grant university deeply interconnected with ecological systems. At a time when the world faces the overlapping crises of climate change, biodiversity loss, pollution, food insecurity, and widening health inequities, universities must move beyond symbolic commitments to embody sustainability in their operations, culture, and physical landscapes. For UPM, the campus itself is an influential arena where planetary health principles can be demonstrated, tested, and scaled. If done correctly, it becomes a model of how higher education institutions can lead societal transformation within Malaysia and the region.

It is essential to strengthen environmental resilience and climate adaptation across UPM's diverse landscapes and built environments. UPM's campus includes a myriad of environments, forests, lakes, wetlands, riparian zones, green





open areas, agricultural plots, animal farms, and dense infrastructure. Each increasingly exposed to climate risks such as extreme rainfall, flash flooding, heat stress, water scarcity, and vector proliferation. These risks will intensify under future climate scenarios, and without integrated planning and systemic interventions, environmental quality, infrastructure integrity, and the continuity of teaching and research may be compromised. By strengthening sustainable food and waste management systems, restoring ecosystems, enhancing green infrastructure, and reducing energy and transport emissions, the strategy increases UPM's capacity to withstand and recover from climate stressors. Nature-based solutions including green corridors, canopy expansion, and ecological restoration provide critical ecosystem services such as cooling, water regulation, and habitat stability, reinforcing long-term campus resilience in alignment with planetary health principles.

This strategy also focuses on the physical, mental, and social well-being of campus populations and surrounding communities by improving the everyday environments that shape learning, productivity, safety, and belonging. Environmental conditions on campus may influence stress levels, disease risks, mobility safety, and social interaction. Furthermore, poor microclimates, unsafe pedestrian routes, limited access to

nutritious foods, or fragmented social spaces can erode quality of life and campus experience. By integrating sustainable waste management, safe and sustainable food ecosystems, green infrastructure, and resilient campus living into one coordinated framework, UPM can deliver a campus environment that supports holistic human development. This reframes sustainability as an enabler of well-being, where environmental enhancement and human flourishing are mutually reinforcing rather than separate agendas.

UPM can also be positioned as a living laboratory that bridges academic excellence with real-world application and talent development. Few universities in the region have UPM's breadth of operational systems and ecological assets co-existing within one campus ecosystem. This creates a high-impact opportunity; when campus operations are designed as testbeds, interventions such as circular economy modules utilising campus waste, adoption of renewable energy systems, sustained ecological restoration projects, and well-being programmes become platforms for experiential learning, public-private partnerships, and innovation. Students gain practical competencies in circular economy, ESG, climate adaptation, biodiversity stewardship, and low-carbon systems, skills that are increasingly demanded by industries and public institutions. Research outputs can be translated into



operational pilots, and successful campus models can be replicated externally through partnerships with government, industry, and communities. In this way, the strategy matters not only for operational performance but also for strengthening UPM's educational relevance and societal contribution.

Finally, the strategy matters because it strengthens governance accountability and resource stewardship, aimed to support UPM's reputation as a sustainability leader. Universities are major consumers of land, energy, water, and materials; without strong systems, they can contribute significantly to emissions, pollution, and inefficiencies. As a public institution, UPM must demonstrate responsible management and transparent sustainability performance aligned with national priorities (including energy transition and low-carbon development) and evolving ESG expectations. Strong performance across waste, energy, ecosystems, food, well-being, and mobility also enhances UPM's positioning in global sustainability benchmarks and rankings, helping attract students, research partners, and funding opportunities. Importantly, UPM's main campus is embedded within the Klang Valley region where improvements in environmental quality, mobility, and community engagement extend benefits beyond the campus boundary, reinforcing civic responsibility and trust. Overall, this strategy matters because it enables UPM to protect its ecological foundations, uplift community well-being, strengthen institutional resilience, and demonstrate credible leadership in planetary health through visible, measurable action.

Current scenario

UPM currently stands at a critical juncture in its transformation toward becoming a planet-friendly ecosystem, reflecting both meaningful progress and emerging pressures across the seven key initiatives under Strategic Outcome 2. The university demonstrates strong strategic alignment with the planetary health agenda, supported by quantifiable advances in renewable energy deployment, food system innovation, biodiversity enhancement, and well-being initiatives. At the same time, increases in water consumption and waste generation signal the need for more systemic, integrated action. Overall, UPM's position can be described as one of active advancement tempered by structural and operational challenges that must be addressed to achieve long-term environmental resilience.

In waste management, UPM has maintained a steady commitment to responsible disposal, segregation, and recycling practices, but total waste volumes have been rising. Organic waste increased by 17.5% (2020–2024), reaching 1,288 tons in 2024. Inorganic waste sent to landfills rose from 1,020 tons in 2021 to 1,440 tons in 2024. Despite these increases, diversion efforts show progress: in 2024, composting expanded to 513.75 tons while inorganic recycling reached 960 tons, indicating improving recovery and circularity. Hazardous and clinical waste streams have also grown in complexity since the operation of Hospital Sultan Abdul Aziz Shah in 2020, but toxic and hazardous waste continues to be managed in compliance with the Environmental Quality Act 1974.



In energy, UPM has emerged as a national leader within the academia lens. The campus generated 16.54 million kWh of solar electricity in 2024 and hosts SURIA16, a 16.18 MW rooftop solar photovoltaic installation implemented through a zero-CAPEX model projected to save RM114 million over 25 years. Renewable energy initiatives resulted in around 12,800 tons of CO₂ avoidance in 2024. Nevertheless, the overall campus carbon footprint remains high at 50,990.33 tCO₂e, with electricity consumption accounting for 47,597.45 tCO₂e, underscoring the need for sustained efficiency improvements and smart performance management to reduce energy intensity. In mobility, transport emissions remain a significant contributor at 3,392.88 tCO₂e, reinforcing the need to strengthen low-carbon transport systems through safer pedestrian-friendly design, better mobility services, and expanded charging and e-mobility infrastructure.

Campus resource management presents a similarly mixed landscape. Total water consumption increased from 3.43 million cubic metres in 2020 to 4.18 million cubic metres in 2024, an approximately 21.7 percent rise over four years. While UPM has deployed smart monitoring systems and expanded rainwater harvesting, the upward trend in consumption indicates growing demand pressures associated with population growth, laboratory operations, and agricultural activities. Research clusters in engineering, science, and technology continue advancing water-quality restoration, wastewater treatment, and soil conservation, signalling strong academic foundations for future nature-based solutions.



In green infrastructure and biodiversity enhancement, UPM benefits from extensive natural assets, including 3,000 hectares in Serdang and 714.18 hectares in Bintulu, with roughly 1,284.14 hectares of farmland across both Peninsular Malaysia and Sarawak. Many biodiversity initiatives have been implemented throughout the years, which highlight UPM's efforts within its ecological role, but a more unified framework is required for monitoring, corridor planning, and habitat protection.

UPM has made clear progress in developing a safe and sustainable food ecosystem, anchored by the Food Security Blueprint 2024, which positions the university as a national leader in campus-based food security. Through initiatives such as Food Security on Campus and Projek Fertigrow@KTDI, residential colleges are actively cultivating vegetables using fertigation, aquaponics, and soil-based methods, demonstrating practical models for urban agriculture and strengthening student participation in sustainable food production. UPM's internal retail platform, Putra Mart, further supports responsible consumption by supplying organically grown produce sourced largely from UPM's own agricultural units, reducing dependency on external suppliers and minimizing environmental impact.

Despite these strengths, the campus food system remains partially fragmented. Food safety standards and sustainable sourcing practices vary across cafeterias, and although UPM produces significant quantities of fresh produce, integration between production, procurement, and consumption is not yet optimised. Organic waste from dining facilities remains a major challenge, with limited linkage to the university's expanding composting capacity, preventing the establishment of a fully circular food recovery chain. While nutrition awareness campaigns and healthier menu efforts are underway, a more cohesive approach is required to connect campus agriculture, retail operations, food safety, nutrition promotion, and waste recovery into a unified, sustainable food value chain that supports both environmental and community well-being.

UPM has established a robust foundation for promoting healthy and resilient campus living, supported by extensive health infrastructure, strong research output, and expanding student-support mechanisms. SDG 3 (Good Health and Well-Being) remains the university's strongest research domain, with 610 publications and 9,522 citations in 2024, reflecting UPM's academic leadership in health sciences, mental health, ageing, and public health. Facilities such as the Hospital Sultan Abdul Aziz Shah (HSAAS), the University Health Centre (PKU), and the Counselling Division (BKU) provide comprehensive medical, psychological, and preventive services, while the Sports Academy anchors physical activity, recreation, and talent development. UPM also strengthens equity and access through targeted initiatives such as the Clinical Kit Assistance Programme valued at RM47,389.27, which supports B40 students undergoing clinical training. Mental health programmes, counselling services, well-being campaigns, and regular health screenings are increasingly integrated into student life, although demand continues to rise with growing enrolment and post-pandemic pressures. Collectively, these initiatives demonstrate strong institutional commitment but also highlight the need for more coordinated approaches to active mobility, green spaces, cultural well-being, and inclusive design to fully embed resilience and social cohesion across the campus community.

Overall, UPM's current position reflects strong momentum toward sustainability, supported by impressive achievements in energy, food systems, biodiversity, and well-being, but challenged by rising waste volumes, increased water use, and the need for more coordinated, data-driven governance. These dynamics underscore the urgency and relevance of Strategic Outcome 2 as the university advances toward a fully regenerative and planet-friendly campus ecosystem.



Key Initiatives

Key Initiative 1 Advancing Sustainable Waste Management Performance and Efficiency

Waste management at UPM is no longer treated merely as a compliance obligation, but as a performance system and behavioural transformation platform. This initiative aims to achieve measurable improvements in efficiency and safety across all waste streams, targeting an annual waste reduction that aligns with Ministry of Higher Education aspirations, while cultivating a circular, waste-aware campus culture.

The foundation of this effort lies in strengthening governance and operational discipline. A centralised University Waste Management Committee, supported by clear policies and operational guidelines, ensures that solid (organic and inorganic), sewage, toxic, and hazardous waste are managed consistently and safely across faculties, residential colleges, laboratories, and the

hospital. Regular audits and policy refinement then create a feedback loop that moves the campus from reactive waste handling to proactive system optimisation.

Beyond systems and enforcement, this initiative recognises that long-term reduction depends on the people. Continuous education modules for staff, students, and vendors are embedded into onboarding and induction processes, reinforcing shared accountability. Student-led sustainability initiatives, supported through structured programmes, micro-credentials, and innovation grants, shift waste awareness from passive compliance to active participation. Behavioural insights and digital nudges further strengthen everyday waste practices.

Most distinctively, waste becomes a learning asset and potential revenue stream. By establishing circular economy modules that utilise real campus waste streams, UPM transforms its operational

by-products into experiential classrooms. Pilots in selected faculties and residential colleges evolve into expanded modules, formal partnerships with recyclers, and pathways for student-led circular enterprises and higher-value innovation. In doing so, waste management advances from disposal-focused practice to an integrated system of governance, education, and circular value creation.

Key Initiative 2 Sustainable Use of Energy

UPM's energy transition strategy focuses on reducing energy intensity and operational emissions while strengthening renewable energy adoption and smart energy governance across campus. With campus carbon footprint (tCO₂e) and renewable energy share (%) as its core performance indicators, this initiative shifts energy management from isolated projects to an integrated, data-driven system.

The first priority is expanding renewable energy generation to increase the share of campus electricity supplied by clean sources. Guided by a dedicated Energy Transition Governance structure under the Centre for Planetary Health, UPM will progressively expand rooftop solar photovoltaic installations, explore agrivoltaic demonstration sites, and integrate battery storage solutions. Over time, these distributed systems will evolve toward a campus microgrid capable of supporting critical facilities and long-duration energy storage, supported by AI-enabled load balancing.

Equally important is demand-side transformation. Systematic energy efficiency retrofits including LED lighting upgrades, HVAC optimisation, occupancy sensors, and centralized Building Automation Systems form the backbone of reducing energy intensity. Real-time digital monitoring, predictive analytics, and ISO 50001 certification pathways will institutionalise continuous performance improvement.

Energy culture also matters. Awareness programmes, micro-credentials in energy efficiency and low-carbon campus management, and gamified inter-college initiatives embed

conservation behaviour into daily campus life. Engagement with industry partners and community stakeholders further extends UPM's energy transition beyond its boundaries.

Finally, annual energy audits and performance scorecards will ensure transparency, benchmarking, and evidence-based decision-making. By integrating renewable expansion, efficiency optimisation, behavioural change, and digital governance, UPM advances toward a resilient, low-carbon campus energy system that demonstrates practical leadership in sustainable energy management.

Key Initiative 3 Campus Ecological Ecosystem Restoration

This initiative strengthens environmental quality and climate resilience across UPM's campus through integrated governance, smart monitoring, ecosystem restoration, and nature-based solutions. Central to this effort is the empowerment of campus resource management through carbon credit and ESG-linked initiatives, supported by strategic public-private partnerships. These mechanisms mobilise financing, technical expertise, and innovation to scale environmental interventions, while aligning campus operations with climate mitigation, adaptation, and sustainability reporting frameworks.

Environmental restoration focuses on rehabilitating campus waterways and expanding nature-based solutions to restore biodiversity, improve ecological balance, and reduce climate-related risks. Targeted interventions include the rehabilitation of rivers, lakes, drainage systems, and riparian zones, alongside the deployment of bioswales, rain gardens, retention ponds, native planting areas, and biological pest control. These measures improve stormwater management, enhance aquatic and terrestrial habitats, reduce flooding and erosion, and strengthen ecological connectivity. Where appropriate, safe ecological corridors are incorporated to minimise human-animal conflicts while maintaining campus biodiversity.



The initiative is underpinned by smart environmental monitoring systems that strengthen evidence-based decision-making and enforcement. Integrated monitoring of water, air, and soil quality provides real-time data to guide targeted conservation, pollution mitigation, and resource-efficiency measures. Water stewardship is enhanced through rainwater harvesting systems, sustainable irrigation practices for agricultural and landscaped areas, and conservation measures embedded within campus operations. These actions reduce environmental pressures, support efficient resource use, and enhance resilience under changing climatic conditions.

Collectively, this initiative positions UPM as a climate-responsive campus that integrates governance, monitoring, and ecosystem restoration to protect environmental quality, strengthen adaptive capacity, and support long-term, nature-positive development aligned with planetary health principles.

Key Initiative 4 **Green Infrastructure Enhancement**

UPM advances a connected, biodiversity-positive green infrastructure system guided by integrated spatial planning, tree-canopy monitoring, and nature-based design that enhances microclimate resilience while supporting responsible human-wildlife coexistence. Performance is tracked through campus canopy cover and tree health indicators, alongside biodiversity scores measuring species richness and abundance.

Green infrastructure enhancement begins with institutionalizing integrated planning frameworks across all major campus development and retrofit projects. The Campus Physical and Land Use/Zoning Master Plan provides the spatial foundation for climate-resilient development, ensuring ecological sensitivity, corridor connectivity, and green infrastructure standards are embedded in long-term campus growth.



Ecological connectivity is strengthened through the identification and expansion of green corridors linking forests, farms, waterways, and habitat hotspots. Pilot connectivity zones evolve into a fully connected ecological network within UPM campuses and satellite labs, enhancing wildlife movement, habitat resilience, and canopy-based cooling benefits along mobility routes and built areas.

Human-animal coexistence is addressed through structured governance and evidence-based design. A dedicated taskforce, campus-wide audits of food leakage and conflict hotspots, native vegetation buffers, smart monitoring tools, and student-led stewardship initiatives reduce risk while fostering responsible engagement. Conflict-prone zones are progressively integrated into smart campus systems, generating longitudinal data and policy insights.

Conservation management is reinforced through ecosystem sensitivity mapping, protected zones, and biodiversity operational frameworks. A centralised tree inventory and canopy mapping system supports annual health monitoring, carbon sequestration modelling, and targeted canopy expansion. Strategic greening of buildings, parking areas, and pathways guided by climate-adaptive landscaping reduces heat stress and enhances campus comfort.

Together, these actions transform green infrastructure from landscape aesthetics into a measurable resilience system that integrates spatial planning, biodiversity stewardship, and climate adaptation into UPM's long-term development trajectory.

Key Initiative 5 **Improve Safe and Sustainable Food Ecosystem**

Food systems on campus are not merely operational services; they are expressions of health, ethics, environmental stewardship, and community resilience. This initiative seeks to strengthen campus food safety, sustainability, and security by transforming UPM's agroecosystems into an integrated, circular, and climate-smart food network. Progress is measured through compliance with sustainable sourcing and safety standards, the campus food circularity rate, contribution of fresh produce from campus agroecosystems, and optimisation of agricultural inputs such as water and fertiliser use.

The strategy begins by empowering campus-based production systems such as urban farming, aquaponics, microalgae units, and smart agriculture solutions to gradually contribute more meaningfully to cafeteria supply chains. What begins as pilots in selected colleges evolves into scaled production supporting campus demand, positioning UPM as a model of embedded food resilience.



At the same time, food governance is strengthened through structured sourcing standards, food safety enforcement, and procurement alignment. Sustainable packaging transitions, beginning with pilot initiatives, progressively eliminate single-use materials and embed circular design into campus dining operations.

Beyond supply, attention is given to consumption and behaviour. Nutrition awareness campaigns and food waste monitoring initiatives encourage healthier dietary choices and reduce avoidable waste in cafeterias. Over time, food waste is reintegrated into composting systems, closing the soil–food loop and strengthening bioresource linkages across campus farms.

Ethical, climate-smart, and welfare-centred farming practices are institutionalised through structured audits, cross-faculty oversight, improved animal housing and feed efficiency, and regenerative agricultural integration. Continuous monitoring and reporting ensure that sustainability, welfare, and food safety become embedded standards rather than aspirational goals. This should also recognise UPM’s architectural heritage and campus identity, ensuring that sustainability interventions protect, enhance, and sensitively adapt heritage buildings and sites as part of the University’s living landscape.

Through these interconnected actions, UPM advances toward a fully integrated campus food ecosystem that reflects safety, circularity, climate responsibility, and long-term food resilience.

Key Initiative 6 Resilient Health and Well-being of Campus Living

A resilient campus is not defined only by infrastructure, but by the well-being, inclusivity, and sense of belonging experienced by its community. This key initiative strengthens campus living by integrating physical, mental, and social well-being into the everyday fabric of university life. Progress is measured through a Campus Well-Being Index, Accessibility and Inclusivity Score, and

active mobility participation rates, reflecting both environmental and social dimensions of resilience.

Wellness is approached comprehensively. Structured task forces and steering committees guide the expansion of accessible counselling services, multilingual support, peer networks, and inclusive spatial design. Fitness and recreation nodes are progressively expanded, while green, conducive work and learning environments are cultivated to reduce stress and promote healthy routines. Over time, universal accessibility and inclusive design principles are embedded across facilities, ensuring that campus spaces serve diverse physical, cultural, and psychological needs.

Beyond services and facilities, well-being is also cultural. By celebrating UPM’s heritage, arts, and community traditions, this initiative reinforces identity and collective cohesion. Annual cultural calendars, partnerships, and campus-wide integration efforts ensure that diversity becomes a lived strength rather than a symbolic value. Women’s leadership, community participation, and intergenerational engagement are also encouraged as important foundations for strengthening care, belonging, and social resilience within the campus ecosystem.

Importantly, behavioural change is encouraged through recognition and incentives. A structured Sustainable Living Awards framework and pilot incentive mechanisms promote everyday sustainable practices, rewarding leadership and positive peer influence. As these programmes scale, they cultivate role models and shared norms that reinforce a healthy, caring campus culture.

Ultimately, this initiative positions UPM as a community where resilience is lived—through active lifestyles, inclusive design, cultural appreciation, and shared responsibility for sustainable well-being.

Key Initiative 7 Efficient Campus Mobility

How people move across campus influences far more than emissions. It affects safety, accessibility, time efficiency, social interaction, and overall quality of life. As campus populations grow and daily travel demand increases, mobility systems must evolve from car-dominant patterns toward low-carbon, people-centred movement networks. This initiative responds to that need by reducing transport-related emissions while making commuting safer, more convenient, and more inclusive.

The transition begins with rethinking space. Campuses function best when walking and cycling are intuitive, safe, and attractive. Continuous pathways, improved crossings, and well-connected corridors reduce friction in everyday movement and encourage active travel as a default choice rather than an alternative. When the physical environment signals safety and accessibility, behaviour gradually follows. This also supports the PUTRA SIHAT UPM agenda by embedding healthier mobility choices into everyday campus life.

At the same time, reliable shared mobility systems reduce dependence on private vehicles. Shuttle services and emerging micromobility options must be responsive to actual travel patterns, especially during peak academic hours. By grounding service improvements in demand analysis and performance tracking, campus transport becomes not just available, but dependable.

Electrification strengthens this transition. Expanding charging infrastructure and progressively converting campus fleets reduce direct transport emissions while signalling institutional commitment to cleaner mobility. When paired with thoughtful parking management and low-emission zones, these measures guide long-term behavioural shifts without compromising accessibility.

Ultimately, efficient campus mobility is not about isolated infrastructure upgrades. It is about aligning spatial design, transport services, and clean energy transition into a coherent system that supports daily life. By prioritising connectivity, safety, and low-carbon adoption, UPM advances toward a mobility ecosystem that is convenient, inclusive, and climate-responsible.





Key Initiative Outcomes

Key Initiative Outcome 1 Circular Campus Waste Ecosystem

This outcome reflects UPM's shift from reactive waste handling to performance-driven resource stewardship. Improving efficiency and safety across solid, sewage, toxic, and hazardous waste streams requires structured governance, standardise procedures, and strengthened compliance mechanisms that operate consistently across faculties, laboratories, residential colleges, and clinical facilities.

Beyond operational control, the outcome recognise that meaningful waste reduction depends on behavioural transformation. Continuous engagement, structured training, and student-led initiatives cultivate shared accountability and normalise responsible waste practices across the campus community. Most distinctively, waste becomes a learning and innovation asset. By embedding circular economy modules that utilise campus waste as a living laboratory platform, UPM transforms operational by-products into experiential education pathways. Composting, material recovery, repair culture, and upcycling initiatives evolve into structured academic and enterprise opportunities.

Through integrated governance, engagement, and circular learning systems, this outcome positions waste management not merely as a compliance function, but as a measurable driver of efficiency, innovation, and cultural change.

Key Initiative Outcome 2: Low-Carbon and Energy-Efficient Campus

Reducing energy intensity and operational emissions is central to UPM's long-term climate resilience and financial sustainability. As energy demand grows alongside campus expansion and research intensity, the transition toward renewable energy sources becomes both an environmental and strategic imperative. Scaling distributed solar installations and exploring complementary storage solutions strengthens supply security while directly lowering the university's carbon footprint.

However, generation alone cannot achieve sustained impact. Deep efficiency improvements through optimised HVAC systems, intelligent lighting upgrades, and building automation shift the campus from consumption-driven growth toward performance-driven optimisation. Smart metering and digital monitoring systems provide real-time visibility into energy patterns, enabling evidence-based decisions and early identification of inefficiencies.

Institutionalising energy governance ensures durability beyond individual projects. Structured audits, transparent reporting, and clear performance benchmarks embed accountability across faculties and operational units. By aligning renewable expansion, efficiency enhancement, and digital intelligence, UPM advances a coordinated energy transition that is measurable, resilient, and aligned with long-term low-carbon development goals.



Key Initiative Outcome 3: Restored and Biodiverse Campus Ecosystems

Restoring ecological systems is fundamental to maintaining campus resilience in the face of climate variability and environmental stress. UPM's landscapes ranging from waterways and wetlands to forests and agricultural plots are living systems that regulate temperature, manage stormwater, filter pollutants, and support biodiversity. Strengthening these natural assets enhances not only environmental quality but also the stability of the broader campus ecosystem.

Ecosystem connectivity plays a critical role in long-term resilience. Linking fragmented habitats through green corridors allows species movement, strengthens genetic diversity, and improves ecological balance. Nature-based solutions such as riparian restoration, bioswales, rain gardens, and native vegetation buffers further reinforce water quality, soil health, and flood mitigation capacity while reducing dependence on hard infrastructure.

This outcome also emphasises measurable environmental intelligence. Monitoring water, air, and soil indicators enables data-driven restoration and adaptive management. By integrating biodiversity stewardship with environmental quality tracking and climate-responsive design, UPM positions its campus as a living laboratory for ecological regeneration where restoration is not isolated intervention, but an embedded system of resilience and environmental renewal.

Key Initiative Outcome 4: Climate-Resilient Green Infrastructure

Green infrastructure at UPM is more than landscape enhancement; it is a structural resilience system embedded within campus planning. By integrating ecological considerations into master planning and infrastructure development, the university ensures that future growth strengthens rather than fragments natural systems. Tree canopy expansion, corridor connectivity, and biodiversity-sensitive zoning contribute directly to heat reduction, stormwater management, and habitat stability.

Canopy monitoring and biodiversity tracking provide measurable foundations for improvement. A centralised tree inventory and health index enable informed decisions on planting, maintenance, and carbon sequestration modelling, while biodiversity indicators guide conservation priorities. These tools transform green assets from aesthetic elements into managed environmental infrastructure.

Nature-based design further enhances everyday campus experience. Strategic greening of built environments, shaded pathways, vegetated buffers, and climate-responsive landscaping reduce heat stress and improve visual and thermal comfort. At the same time, structured governance supports responsible human-wildlife coexistence through evidence-based mitigation and community stewardship. Together, these efforts position green infrastructure as a core driver of resilience, ecological integrity, and long-term campus sustainability.



Key Initiative Outcome 5

Safe and Sustainable Campus Food Ecosystem

Food systems are central to both environmental sustainability and community well-being. Strengthening campus food safety and security begins with reinforcing agro-supply chains that connect campus-based production to dining operations. By integrating smart agriculture, urban farming, and circular bioresource practices, UPM enhances its capacity to contribute fresh produce while reducing reliance on external supply volatility.

Governance and standards ensure that sustainability is consistent and measurable. Clear sourcing policies, food safety enforcement, and structured procurement alignment embed accountability across cafeterias, vendors, and suppliers. At the same time, reducing food waste and transitioning toward sustainable packaging decrease environmental burdens and strengthen circular linkages between consumption, composting, and campus farming systems.

Ethical and climate-smart agricultural practices further reinforce long-term resilience. Welfare-centred animal farming, efficient water and fertiliser use, and regenerative approaches position campus food production as both responsible and forward-looking. Through integrated supply management, behavioural change, and circular resource flows, UPM advances a safe, sustainable, and climate-resilient food ecosystem that reflects its broader commitment to planetary health.

Key Initiative Outcome 6

Healthy, Inclusive and Resilient Campus Community .

A resilient campus is built upon the physical, mental, and social well-being of its community. Strengthening well-being requires more than isolated services; it calls for coordinated wellness systems that promote active lifestyles, accessible counselling, peer support networks, and inclusive spaces that foster safe and meaningful interaction. By embedding these elements into everyday campus life, UPM cultivates environments where students and staff can thrive academically and personally.

Well-being is also shaped by identity and belonging. Celebrating cultural appreciation, local knowledge, and UPM's heritage enriches collective memory and strengthens social cohesion across diverse communities. When cultural expression and inclusivity are visibly embedded in campus programmes and spaces, they reinforce shared values and mutual respect.

Sustainable behaviour further supports long-term resilience. Structured recognition and incentive mechanisms encourage environmentally responsible habits and peer leadership. By aligning wellness, cultural engagement, and sustainability incentives, UPM advances a campus culture where health, inclusivity, and responsible living are mutually reinforcing dimensions of a resilient community.



Key Initiative Outcome 7

Accessible, Integrated and Low-Emission Mobility.

Mobility is a daily experience that shapes safety, and well-integrated, reliance on private vehicles naturally declines, easing congestion and improving campus flow.

As campus activity intensifies, transport systems must evolve from car-dependent patterns toward low-carbon, people-centred movement networks. Reducing transport-related emissions requires not only technological change, but spatial redesign that makes walking and cycling intuitive, safe, and attractive for everyday travel.

Reliable shared mobility further strengthens this transition. Shuttle services and emerging mobility solutions must respond to real commuting patterns, particularly during peak academic hours. When public and shared transport options are dependable

Electrification reinforces long-term emissions reduction. Expanding charging infrastructure and progressively transitioning fleets toward low-emission vehicles signal institutional commitment while enabling behavioural change. Together, spatial improvements, service reliability, and clean vehicle adoption form a coherent mobility ecosystem, one that aligns convenience, safety, and climate responsibility within the broader vision of a resilient, planet-friendly campus.





Key Initiatives Indicator Outcomes

Key Initiative Outcome 1

Circular Campus Waste Ecosystem.

Progress under this initiative is measured through a minimum 3% annual waste reduction, aligned with KPT sustainability targets and Malaysia's commitment to SDG 12 (Responsible Consumption and Production). Waste reduction performance is monitored through total waste generation trends across solid, organic, and regulated waste streams using standardised campus reporting systems and annual audits. This indicator reflects improvements in upstream prevention, operational efficiency, and behavioural change, while reinforcing compliance with the Environmental Quality Act 1974 and institutional waste governance frameworks. Anchoring performance to a quantified annual reduction ensures measurable accountability and continuous improvement in campus resource stewardship.

Key Initiative Outcome 2

Low-Carbon and Energy-Efficient Campus.

Progress under this initiative is measured through total campus carbon footprint (tCO₂e) and renewable energy share (% of total electricity consumption). Carbon performance is calculated in accordance with the GHG Protocol Corporate Standard, covering Scope 1 and Scope 2 emissions and progressively incorporating relevant Scope 3 sources. Renewable energy share reflects the proportion of electricity generated from on-site or procured clean sources, aligned with Malaysia's National Energy Transition Roadmap (NETR) and SDG 7 (Affordable and Clean Energy). Together, these indicators provide a transparent basis for tracking decarbonisation, energy transition, and long-term institutional climate accountability.

Key Initiative Outcome 3

Restored and Biodiverse Campus Ecosystems.

Three indicators are used to track progress under KI3, which includes: i) Environmental Quality Index (EQI); ii) Percentage of Waterways and Green Spaces under Restoration; and iii) Campus Climate Resilience Score. The EQI is measured through aggregated indicators covering water quality (e.g. BOD, COD, turbidity), air quality parameters, and soil organic carbon and fertility indicators, consistent with environmental monitoring practices under the Environmental Quality Act 1974 and ecosystem health frameworks. The percentage of waterways and green spaces under restoration is calculated based on the proportion of campus rivers, lakes, riparian buffers, wetlands, and green areas undergoing active rehabilitation using nature-based solutions, verified through GIS mapping and project records. The Campus Climate Resilience Score is assessed using proxy measures such as the number of smart environmental sensors installed, reduction in flood-prone hotspots, extent of nature-based solution coverage, and establishment of safe wildlife zones, aligned with climate adaptation and resilience principles under SDG 13 and SDG 15.

Key Initiative Outcome 4

Climate-Resilient Green Infrastructure.

Two indicators are used to track progress under KI4, which includes: i) Campus Canopy Cover (%) and ii) Tree Health Index. Campus Canopy Cover is measured as the percentage of land area shaded by tree canopy, derived from aerial imagery, GIS analysis, and periodic canopy mapping, while the Tree Health Index is assessed through field inspections covering species condition, growth, mortality rates, and disease incidence, consistent with urban forestry and carbon sequestration monitoring practices (FAO; Intergovernmental Panel on Climate Change). Data is collected through ecological surveys, citizen science programmes, and habitat monitoring, supporting evidence-based conservation, green corridor planning, and long-term ecosystem resilience.

Key Initiative Outcome 5

Safe and Sustainable Campus Food Ecosystem.

Four indicators are used to track progress under KI5, which includes: i) Percentage of Food Outlets Compliant with Sustainable Sourcing and Food Safety Standards; ii) Campus Food Circularity Rate; iii) Fresh Produce Contribution from Campus Agroecosystems; and iv) Optimisation of Agricultural Inputs (Water and Fertiliser Use). Compliance of food outlets is assessed through routine inspections, vendor audits, and certification checks aligned with Malaysia's Food Act 1983, Food Hygiene Regulations 2009, and sustainable procurement guidelines. The Campus Food Circularity Rate is calculated as the proportion of food waste recovered through composting or bioresource pathways relative to total food waste generated, consistent with circular economy reporting under GRI 306. Fresh Produce Contribution is measured as the share of cafeteria produce supplied by campus agroecosystems, verified through procurement and production records, supporting food security objectives under SDG 2. Optimisation of agricultural inputs is monitored using water-use efficiency and nutrient application rates, aligned with climate-smart agriculture principles promoted by The Food and Agriculture Organisation (FAO).





Key Initiative Outcome 6

Healthy, Inclusive and Resilient Campus Community

Three indicators are used to track progress under KI6, which includes: i) Campus Well-Being Index; ii) Accessibility and Inclusivity Score; and iii) Active Mobility Participation Rate. The Campus Well-Being Index is measured using aggregated indicators covering mental health, physical activity, perceived safety, social connectedness, and access to support services, derived from periodic surveys, service utilisation data, and programme participation, aligned with SDG 3 and university well-being assessment frameworks. The Accessibility and Inclusivity Score is assessed through the number of inclusive and barrier-free zones created, universal design compliance audits, and participation rates in cultural and community programmes, consistent with inclusive campus and social sustainability principles. Active Mobility Participation Rate is measured as the percentage of the campus community regularly using walking, cycling, or e-mobility routes, based on travel surveys, mobility app data, and facility usage records, supporting low-carbon and healthy living objectives under SDG 11.

Key Initiative Outcome 7

Accessible, Integrated and Low-Emission Mobility

Two indicators are used to track progress under this initiative: i) Low-carbon mobility uptake (% of EV, hybrid, or other low-emission vehicles), and ii) Mode share of walking, cycling, shuttle, and electric mobility (%). Low-carbon uptake reflects the transition toward cleaner vehicle technologies, aligned with Malaysia's Low Carbon Mobility Blueprint and SDG 11 (Sustainable Cities and Communities). Mode share is measured through periodic mobility surveys and transport data analysis, capturing behavioural shifts toward active and shared transport. Together, these indicators assess both technological transition and commuter behaviour change in advancing a low-emission campus mobility system.



Key Action Plan

Key Action Plan 1 Advancing Sustainable Waste Management Performance and Efficiency

1. Efficient management of solid (organic and inorganic), sewage, toxic, e-waste, and hazardous waste.
2. Deliver continuous awareness, training, and outreach programmes, including student-led sustainability initiatives on waste management.
3. Establish circular economy modules utilising campus waste.

Key Action Plan 2 Sustainable Use of Energy

1. Expand renewable energy generation across campus, including rooftop solar, agrivoltaics systems, and energy storage solutions under structured governance.
2. Implement systematic energy efficiency retrofits and intelligent building management systems.
3. Deploy smart metering, digital dashboards, and predictive energy analytics to strengthen performance monitoring.
4. Institutionalise energy governance through audits, benchmarking, and transparent reporting mechanisms.

Key Action Plan 3 Campus Ecological Ecosystem Restoration

1. Develop carbon credit and ESG-linked initiatives through public-private partnerships.
2. Implement nature-based rehabilitation and biodiversity restoration across degraded waterways and green spaces.
3. Establish smart environmental monitoring systems and an integrated environmental intelligence framework.

Key Action Plan 4 Green Infrastructure Enhancement

1. Mandate the use of integrated frameworks for all major campus planning and infrastructure projects.
2. Establish green corridors and ecological connectivity to link habitats and enhance ecosystem resilience.
3. Strengthen human-animal coexistence through campus design, governance, and community stewardship.
4. Identify and manage campus biodiversity toward conserving sensitive ecosystems.
5. Develop and maintain a campus tree inventory and canopy map to monitor biodiversity health and carbon sequestration.
6. Enhance microclimate, visual quality, and campus resilience through strategic greening of built infrastructure and nature-based landscape design utilising reinvestments from savings.

Key Action Plan 5 Improve Safe and Sustainable Food Ecosystem

1. Empower campus agroecosystem supply chains to cater to campus needs.
2. Implement sustainable sourcing and campus food safety standards safeguarded through enforcement mechanisms.
3. Embed policies on sustainable food packaging.
4. Promote nutrition awareness and reduce food waste in cafeterias.
5. Strengthen food security and circular bioresource linkages.
6. Institutionalise ethical, climate-smart, and welfare-centred animal farming and agricultural practices.



Key Action Plan 6 Resilient Health and Well-being of Campus Living

1. Implement comprehensive wellness programmes supporting physical, mental, and social well-being through active lifestyles, accessible counselling, peer support, and inclusive spaces.
2. Celebrate cultural appreciation and local knowledge by embedding UPM's heritage, arts, and traditions into campus life.
3. Introduce award and incentive mechanisms to promote sustainable practices within the campus community.

Key Action Plan 7 Efficient Campus Mobility

1. Develop safe, continuous, and universally accessible active mobility infrastructure.
2. Strengthen campus public and shared mobility services through route optimisation and service reliability improvements.
3. Accelerate low-emission vehicle adoption through fleet electrification, EV charging infrastructure, and demand management measures.





Nature-Based Solution (NbS) for Sustainable Plantations

The UPM-Hiroshima University Living Lab is spearheading a novel landscape and climate-friendly approach to sustainable oil palm cultivation by adopting conservation grazing as a powerful NbS, directly addressing the industry's reliance on chemical herbicides and rodenticides. This initiative integrates multi-species ruminant livestock animals (e.g., cattle, goats, and sheep) into the plantation ecosystem, where they naturally control undergrowth, and safeguarding human health by reducing chemical exposure. Conservation grazing actively creates a more hospitable habitat for biodiversity, while the use of rotational grazing specifically contributes to increased soil organic matter and accelerates soil health rehabilitation via enhanced fertility from manure deposition. For pest control, promotion of multiple native predator bird species (such as kingfishers and birds of prey) to sustainably manage pest rodent populations reduces the need for rodenticides. In the long run, these integrated practices significantly reduce the carbon footprint associated with the manufacture, transport, and application of agrochemicals, demonstrating the core principles of a circular bioeconomy. By showcasing this integrated, regenerative agriculture practice, UPM demonstrates a viable pathway for aligning oil palm production with global environmental mandates, supporting multiple UN SDGs (such as SDG 3: Good Health and Well-being, SDG 15: Life on Land, and SDG 13: Climate Action) and strengthening adherence to sustainability certifications like RSPO and MSPO, ultimately contributing to Planetary Health and securing Food Security.



SURIA 16 Project @ UPM

The SURIA16@UPM Project is an iconic collaboration between UPM and Tenaga Nasional Berhad (TNB) – GSPARX Sdn. Bhd., as it successfully became the Largest Rooftop Solar Photovoltaic (PV) Installation Project in Public Universities, and even in Malaysia. The SURIA16 initiative also includes Malaysia's first Large-Scale Integrated Hydroponic-Aquavoltaic Project, combining floating solar panels, hydroponic agriculture, and ecotourism, known as the Large Scale Integrated Hydroponic-Aquavoltaic Systems (IHAS), located at the Faculty of Engineering, UPM. It is now more popularly referred to as the "Floating Solar & Walkway @ Eng UPM" (FSW@Eng). Both of these iconic projects have been recognised by the Malaysia Book of Records (MBoR). Implemented through a Public-Private Partnership (PPP) model, the SURIA16@UPM Project introduces a zero-capital expenditure approach or Zero-CAPEX, where TNB fully finances the entire RM45 million cost, significantly reducing UPM's initial financial commitment. The project aligns with the UPM aims that emphasises sustainability, research, innovation, and strong industry-community collaboration. The 16.18 Megawatt-peak (MWp) Solar PV System has been installed across 12 sites, covering various building rooftops including a mosque, hospital parking structures, as well as floating solar installations on water bodies. The IHAS floating solar system introduces an innovative method of land optimisation while enhancing energy efficiency, simultaneously supporting the nation's food security efforts.

Suggested Roadmap

Key Initiative	Intended Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Consolidation 2032 to 2035
K1. Advancing Sustainable Waste Management Performance and Efficiency	A circular campus waste ecosystem that improves efficiency, safety, recovery, and behavioural transformation across all waste streams.	- Efficient management of solid (organic and inorganic), sewage, toxic, e-waste, and hazardous waste. - Deliver continuous awareness, training, and outreach programmes, including student-led sustainability initiatives on waste management. - Establish circular economy modules utilizing campus waste.	Establish the University Waste Management Committee; policy, and operational guidelines; develop waste education modules and Student Sustainability Champions Programme; pilot circular economy modules in selected PTJs and residential colleges; conduct baseline waste audits and define KPIs.	Implement campus-wide waste policies and SOPs; institutionalise training in staff and student onboarding; expand circular economy modules and formalise partnerships with recyclers; develop digital dashboards, and PTJ-level performance incentives.	Refine policies based on audit evidence; integrate behavioural nudging systems and community outreach; introduce higher-value circular innovation modules; advance predictive analytics, selected zero-landfill waste streams, and national reporting linkages.
K2. Sustainable Use of Energy	A low-carbon and energy-efficient campus supported by renewable energy expansion, smart performance management, and an energy-conscious university culture.	- Expand renewable energy generation across campus, including rooftop solar, agrivoltaics systems, and energy storage solutions under structured governance. - Implement systematic energy efficiency retrofits and intelligent building management systems. - Deploy smart metering, digital dashboards, and predictive energy analytics to strengthen performance monitoring. - Institutionalise energy governance through audits, benchmarking, and transparent reporting mechanisms.	Establish energy transition governance and a renewable energy roadmap; conduct feasibility studies for solar expansion and agrivoltaics; initiate LED and HVAC retrofits; occupancy sensors, and baseline energy audits; launch awareness programmes, staff and student induction modules, and annual Energy Week.	Expand solar PV, battery storage, and agrivoltaic demonstration sites; strengthen HVAC upgrades and Building Automation Systems; embed conservation activities into PTJ KPIs; introduce microcredentials, gamified energy reduction initiatives, and community partnerships; publish annual energy performance scorecards.	Develop a campus microgrid for critical facilities; implement long-duration storage and AI-enabled load balancing; integrate AI into building energy management; achieve ISO 50001 certification for key buildings; institutionalise digital nudging, energy culture surveys, predictive audits, and global benchmarking.



Suggested Roadmap

Key Initiative	Intended Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Consolidation 2032 to 2035
K3. Campus Ecological Ecosystem Restoration	Restored and biodiverse campus ecosystems supported by nature-based solutions, smart environmental monitoring, and resource stewardship.	1. Develop carbon credit and ESG-linked initiatives through public-private partnerships. 2. Implement nature-based rehabilitation and biodiversity restoration across degraded waterways and green spaces. 3. Establish smart environmental monitoring systems and an integrated environmental intelligence framework.	Identify carbon project opportunities and establish a Carbon and ESG Partnership Working Group; conduct feasibility studies for carbon crediting; identify degraded waterways and drainage hotspots; pilot nature-based solutions in selected sites; develop environmental monitoring plans and deploy pilot smart sensors.	Implement verified carbon projects with industry partners; integrate carbon reporting into sustainability reporting; expand nature-based solutions to water-sensitive zones; develop ecological corridors; expand smart monitoring campus-wide; introduce real-time environmental dashboards and sensor-triggered irrigation.	Generate carbon credits from selected projects and establish a UPM Carbon Lab; integrate nature-based solutions into new campus development planning; reduce flood-prone zones and restore biodiversity baselines; establish a fully integrated Environmental Intelligence System with AI-driven climate adaptation modelling.
K4. Green Infrastructure Enhancement	A climate-resilient green infrastructure network that strengthens canopy cover, ecological connectivity, biodiversity conservation, and responsible human-animal coexistence.	1. Mandate the use of integrated frameworks for all major campus planning and infrastructure projects. 2. Establish green corridors and ecological connectivity to link habitats and enhance ecosystem resilience. 3. Strengthen human-animal coexistence through campus design, governance, and community stewardship. 4. Identify and manage campus biodiversity toward conserving sensitive ecosystems. 5. Develop and maintain a campus tree inventory and canopy map to monitor biodiversity health and carbon sequestration. 6. Enhance microclimate, visual quality, and campus resilience through strategic greening of built infrastructure and nature-based landscape design utilising reinvestments from savings.	Establish the planning technical committee and develop the Campus Physical, Land Use, and Zoning Master Plan; identify corridor routes and biodiversity hotspots; pilot a green corridor; establish a Human-Animal Coexistence Taskforce and conduct conflict hotspot audits; undertake ecosystem sensitivity mapping, campus tree inventory, and climate-adaptive landscaping pilots.	Implement the Master Plan across new projects and retrofits; expand green corridors across faculties, farms, and forests; redesign selected interface zones to reduce conflict risks; enforce conservation guidelines; develop biodiversity operational frameworks; integrate canopy mapping into GIS and scale greening of buildings, parking areas, and pathways.	Review zoning plans through climate resilience modelling; institutionalise periodic plan revision; develop a fully connected ecological network across Serdang and Bintulu campuses; integrate conflict-prone zones into smart campus systems; strengthen long-term ecological monitoring, carbon sequestration modelling, and heat-island performance evaluation.

Suggested Roadmap

Key Initiative	Intended Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Consolidation 2032 to 2035
K5. Improve Safe and Sustainable Food Ecosystem	A safe, circular, climate-smart, and resilient campus food ecosystem linking production, procurement, consumption, and bioresource recovery.	1. Empower campus agroecosystem supply chains to cater to campus needs. 2. Implement sustainable sourcing and campus food safety standards safeguarded through enforcement mechanisms. 3. Embed policies on sustainable food packaging. 4. Promote nutrition awareness and reduce food waste in cafeterias. 5. Strengthen food security and circular bioresource linkages. 6. Institutionalise ethical, climate-smart, and welfare-centred animal farming and agricultural practices.	Pilot farms, aquaponics, microalgae units, and smart farming solutions; establish a Food Sustainability Steering Committee and develop sourcing standards and SOPs; pilot sustainable packaging; launch nutrition campaigns and food waste monitoring; map food waste flows and pilot composting linkages; conduct baseline audits of farms and establish cross-faculty oversight.	Scale campus production to supply cafeterias; enforce sourcing and food safety standards across outlets; transition cafeterias and events toward sustainable packaging; standardise segregation in dining areas and incentivise low-waste cafeterias; expand the compost-soil-food cycle; upgrade priority farm operations and implement climate-smart livestock and regenerative agriculture practices.	Establish a fully integrated campus food production system; integrate procurement with carbon and nutrition metrics; position UPM as a zero single-use packaging campus; institutionalise a circular food ecosystem connected to composting and farming; integrate animal welfare and sustainability indicators into food safety, HSE, and sustainability reporting systems.
K6. Resilient Health and Well-being of Campus Living	A healthy, inclusive, and resilient campus community supported by comprehensive wellness systems, cultural belonging, accessibility, and sustainable living incentives.	1. Implement comprehensive wellness programmes supporting physical, mental, and social well-being through active lifestyles, accessible counselling, peer support, and inclusive spaces. 2. Celebrate cultural appreciation and local knowledge by embedding UPM's heritage, arts, and traditions into campus life. 3. Introduce award and incentive mechanisms to promote sustainable practices within the campus community.	Establish wellness taskforces and assess community needs; map space requirements and expand counselling and multilingual access; design green and conducive work environments; create a Cultural Integration Committee; develop a Sustainable Living Awards Framework and pilot incentive mechanisms.	Expand fitness nodes and inclusive campus zones; standardise peer-support training; implement annual cultural calendars and local partnerships; scale up award programmes campus-wide to encourage sustainable living practices.	Establish a full network of active mobility and recreation amenities; achieve comprehensive accessibility and universal design compliance; integrate a digital mental health ecosystem; embed cultural identity across campus life; showcase best practices and role models that reinforce a healthy, resilient, and caring campus community.

Suggested Roadmap

Key Initiative	Intended Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Consolidation 2032 to 2035
K7. Efficient Campus Mobility	An accessible, integrated, and low-emission mobility ecosystem that improves safety, connectivity, convenience, and climate responsibility.	1. Develop safe, continuous, and universally accessible active mobility infrastructure. 2. Strengthen campus public and shared mobility services through route optimisation and service reliability improvements. 3. Accelerate low-emission vehicle adoption through fleet electrification, EV charging infrastructure, and demand management measures.	Upgrade pedestrian paths and cycling lanes; map priority corridors and safety hotspots; pilot e-bike and e-scooter services; conduct baseline travel demand and peak-hour analysis; deploy the first wave of EV chargers and pilot priority parking measures.	Expand connected walking and cycling networks across major campus zones; improve lighting, shading, crossings, and speed calming; introduce low-carbon commuting incentives; scale shuttle service improvements and formalise shared mobility partnerships; accelerate fleet electrification and expand EV charging coverage.	Establish a fully connected pedestrian and cycling ecosystem; achieve a mature low-emission fleet and campus charging network; introduce low-emission zones; optimise shuttle and shared mobility operations using demand data; institutionalise annual service reviews and user satisfaction targets.

Strategic Outcome 3: Institutional Wisdom as a Transformative Agent

Introduction

Institutional wisdom refers to the collective intelligence, ethical judgement, and adaptive capacity of a university to navigate complex, interlinked planetary health and sustainability challenges. It embodies the ability of an institution to synthesise knowledge, reflect on evidence and experience, and translate insight into responsible and contextually grounded action. For UPM, institutional wisdom is not an abstract ideal but a living organisational capability that integrates sustainability into the core functions of teaching, research, governance, operations, and community engagement.

Guided by the philosophy “With Knowledge We Serve” (“Berilmu Berbakti”), UPM positions institutional wisdom as the moral, epistemic, and strategic compass that informs institutional decisions, partnerships, and innovations. Together, these functions enable UPM to act as a coherent, learning-oriented institution capable of aligning scientific excellence, local wisdom, and societal needs.

Institutional wisdom also explicitly recognises the importance of local and indigenous knowledge systems alongside scientific expertise. This strengthens UPM’s role not only as a knowledge producer, but also as a steward of societal learning and transformation.

- Through this strategy, UPM seeks to:
- Embed sustainability and planetary health thinking across institutional culture, governance, and operations.
- Systematically integrate and translate knowledge into operational practice and policy-relevant outputs.
- Cultivate ethical, future-ready leaders capable of reflexive and responsible stewardship.
- Institutionalise continuous monitoring, learning, and adaptation to ensure long-term impact and resilience.

- Position UPM as a national and global reference point for sustainability advisory and knowledge-to-impact pathways.

Institutional wisdom thus functions as both a means and an outcome. It represents a transformative institutional capacity that empowers UPM to better serve the community and industry, safeguard planetary systems, and sustain intergenerational well-being. More importantly, it provides a structured avenue to demonstrate UPM’s distinctive innovation capability and commitment to sustainability solutions rooted in its own strengths and context, through Inovasi PUTRA.

Planetary health challenges such as food insecurity, climate instability, biodiversity loss, and rising public health risks are increasingly characterised by systemic interdependence, uncertainty, and non-linear change. These challenges cut across sectors, scales, and time horizons, rendering purely technical or disciplinary solutions insufficient. What is required is not only scientific excellence, but institutional judgement: the capacity to synthesise diverse knowledge, and act responsibly.

The PHSB mapping envisions institutional wisdom as the driving force for planetary health, through the structured interaction of Strategic Outcomes (SO) and Key Initiatives (KI). Knowledge integration is where UPM consolidates scientific evidence, policy intelligence, local and indigenous knowledge, and experiential learning into coherent decision frameworks. This integration function enables the university to move beyond fragmented expertise towards systems-level understanding of planetary health risks and trade-offs via the following approach:



Knowledge integration & operations - UPM will systematically combine academic research with indigenous and practical experience to solve sustainability challenges. This “integrated wisdom” is then embedded directly into the university’s daily operations, campus management, and decision-making processes, ensuring that sustainability is lived, not just studied. Taking

Advisory & Policy Engagement - The university acts as a vital bridge between science and society. By translating complex research and lived experiences into “decision-ready” tools such as policy briefs, technical guidelines, and pilot projects UPM provides actionable solutions for government, industry, and local communities.

Learning & Accountability - Through reflexive monitoring, the university continuously tracks its progress. By reflecting on both successes and limitations, UPM adapts its strategies to stay relevant to changing environmental conditions and societal feedback.

Over time, institutional wisdom becomes part of UPM’s legacy. It ensures continuity across leadership transitions, policy cycles, and external shocks. By embedding ethical reasoning, learning, and adaptation into its institutional DNA, UPM positions itself to remain relevant, trusted, and resilient in an era of accelerating planetary change. Institutional and local wisdom matter because they transform UPM from a repository of expertise into a coherent, learning-oriented institution capable of judgement, action, and stewardship.

The ultimate goal is to align the university’s entire ecosystem with sustainability principles. This approach fosters evidence-informed leadership and ensures that current environmental decisions respect “intergenerational” responsibilities protecting the wellbeing of both present and future generations. In short, it formalises a cycle where knowledge generates action, action creates impact, and impact is continuously refined for long-term value

Current scenario

UPM has made substantive progress in embedding sustainability and planetary health principles across its institutional ecosystem. The university has developed a range of policies, governance structures, and operational practices that signal a maturing commitment to sustainability. Frameworks such as the UPM Sustainability Policy, the Green Campus Roadmap, and engagement with the Sustainable Development Solutions Network (SDSN) have strengthened alignment between academic programmes, research activities, and campus operations. The establishment of Sustainability Governance Committees, faculty-level green offices, and the Sustainability Excellence Award demonstrates the university’s efforts to institutionalise responsibility and encourage continuous improvement.

Academic integration has also expanded, with sustainability concepts increasingly embedded across disciplines such as agriculture, environmental science, engineering, and education. Experiential and transdisciplinary platforms—including Living Labs and UPM’s Global Classroom—have enhanced learning environments that cultivate systems thinking and SDG-related competencies. Research and innovation are supported through mechanisms such as the Research Management Centre (RMC), the University Community Transformation Centre (UCTC), and industry partnerships that mobilise expertise in sustainable agriculture, renewable energy, biodiversity conservation, and waste management.

Despite this momentum, UPM still has to address challenges that limit the full institutionalisation of sustainability and planetary health. Fragmentation remains across faculties, with varying levels of maturity in implementation and limited cross-sector coordination. Monitoring and evaluation practices differ across units, resulting in inconsistent reporting and limited visibility of outcomes at the university level. Although UPM demonstrates strong research performance in sustainability-related fields, more systematic mechanisms are required to translate these outputs into policy, practice, and



societal impact. At the cultural level, institutional wisdom—centred on ethical reflection, evidence-informed decision-making, and continuous learning—has not yet been fully embedded into everyday governance processes.

To address these gaps, the Blueprint aims to shift UPM from project-based implementation towards full institutionalisation. This shift requires moving beyond isolated initiatives to a coherent, university-wide system that integrates sustainability into governance, academic excellence, research translation, and community engagement. A central component of this transformation is the establishment of a coherent monitoring and measurement framework that enables consistent tracking, reporting, and learning across all levels of the institution.

UPM aspires to operationalise this institution-wide framework during Phase 1 of the Blueprint (2026–2028), with full consolidation and stabilisation by 2030, and reflexive, continuous-learning governance embedded by 2035. The framework will include:

Standardised indicators aligned with planetary health principles, SDG targets, and UPM’s strategic priorities.

Digital dashboards and automated data pipelines to strengthen real-time monitoring and transparent reporting.

Faculty-level integration mechanisms, ensuring that sustainability indicators are embedded into annual planning, performance reviews, and quality assurance systems.

A central coordination unit responsible for institutional analysis, synthesis of insights, and periodic reporting to university leadership.

Continuous learning loops, where monitoring results inform policy adjustment, resource allocation, and strategic planning.



By establishing a harmonised monitoring and measurement architecture, UPM will enhance coherence, strengthen decision-making, and ensure that sustainability and planetary health commitments are embedded within institutional behaviour, not only institutional documents. This forms the foundation for transitioning UPM into a wisdom-driven, resilient, and future-ready university.

Key Initiatives

Key Initiative 1 Integrated Knowledge and Innovation Transfer Programme

This initiative establishes a formal, institution-wide knowledge integration and transfer system that enables UPM to translate sustainability-related research, innovation, and experiential knowledge into coherent, decision-ready outputs and operational applications. The programme moves beyond ad hoc dissemination towards a structured institutional capability.

The programme consolidates and aligns existing platforms such as RMC, UCTC, faculty-based innovation units, and campus and community living laboratories into a single, coordinated knowledge-to-impact pipeline. This pipeline ensures that research findings, technological innovations, and

community insights are systematically synthesised, prioritised, and channelled into operational practices, pilot interventions, and policy-relevant outputs. Priority thematic areas reflect mapped PHSB focus domains, including food systems resilience, climate adaptation, biodiversity and ecosystem stewardship, and human–environment interactions.

A core enhancement introduced through this initiative is the formal integration of operational feedback loops. Pilots and demonstrations implemented through living laboratories and community projects function as test beds for refining solutions, generating practice-based evidence, and informing subsequent decision-making. Outputs include policy briefs, technical guidelines, implementation toolkits, and scalable intervention models aligned with national and institutional sustainability priorities.

Capacity development is embedded within the programme to strengthen institutional competence in knowledge brokering and translation. Researchers, students, and professional staff are trained in systems thinking, policy communication, operational design, and stakeholder facilitation. This positions the university community not merely as knowledge producers, but as active carriers of institutional wisdom, capable of bridging science, operations, and societal needs.



Key Initiative 2 Multi-Level Sustainability Wisdom and Advisory Practice

This initiative institutionalises a structured sustainability advisory function that mobilises UPM's multidisciplinary expertise to support decision-making across community, local authority, state, national, and sectoral levels. Explicitly aligned with the Advisory and Policy Engagement function in the mapping in this Blueprint, the initiative shifts advisory work from fragmented expert engagements to a coordinated institutional practice.

The advisory platform synthesises integrated knowledge and operational insights into policy-relevant, context-sensitive guidance. It supports ministries, agencies, industries, and communities in addressing complex sustainability challenges related to planetary health, food systems, environmental governance, and socio-ecological risk. Psychosocial Impact Assessment (PSIA) and systems-based analytical tools are embedded as standard advisory components, enabling assessment of social readiness, equity implications, behavioural dynamics, and adaptive capacity.

Advisory engagements prioritise co-development rather than one-way knowledge transfer. Policy briefs, transition roadmaps, regulatory support tools, and implementation frameworks are produced through iterative engagement with stakeholders, ensuring legitimacy and practical applicability. Early-stage advisory input strengthens policy design by anticipating risks, trade-offs, and unintended consequences, while downstream engagement supports implementation and monitoring.

At the community level, participatory advisory approaches enhance social acceptance and local ownership of sustainability interventions. By institutionalising advisory practice as part of UPM's core mission, this initiative strengthens Malaysia's sustainability governance ecosystem while reinforcing UPM's role as a trusted, ethically grounded intermediary between science, policy, and society.

Key Initiative 3 Internal Learning Partnerships and Capacity Building Programme

This initiative strengthens UPM's internal capability to function as a reflexive, learning-oriented institution, directly responding to gaps identified in the PHSB mapping. Its purpose is to embed continuous learning, systems thinking, and ethical judgement across leadership, academic, and professional domains.

The programme establishes internal learning partnerships across faculties, institutes, administrative units, and campus operations, enabling structured peer learning and cross-functional collaboration. Sustainability pilots, advisory engagements, and operational initiatives serve as shared learning cases through which lessons, failures, and best practices are systematically captured and disseminated.

Capacity-building modules focus on sustainability literacy, systems analysis, knowledge integration, policy engagement, and reflexive governance. Leadership development components emphasise long-term stewardship, ethical decision-making, and institutional accountability, ensuring that sustainability values are consistently translated into practice. Communities of practice support continuous skill development and reduce reliance on individual champions.

A key innovation of this programme is the institutionalisation of feedback loops. Insights from monitoring and evaluation are fed back into strategy refinement, curriculum development, and operational improvement. This ensures that institutional wisdom evolves dynamically in response to changing planetary conditions and societal needs.

By embedding learning as a core organisational function, UPM strengthens its resilience, coherence, and long-term impact, positioning institutional and local wisdom as enduring assets that sustain the university's transformative role in planetary health and sustainability.



Key Initiative Outcomes

Outcome 1 Institutionalised Knowledge-to-Decision Coherence

The primary outcome of Strategic Outcome 3 is the institutionalisation of coherent knowledge-to-decision pathways across UPM. Sustainability-related knowledge is no longer generated, applied, or evaluated in isolation. Instead, research, innovation, operational practice, and governance are connected through shared frameworks, priorities, and feedback mechanisms.

This outcome manifests as stronger internal alignment across faculties, institutes, administrative units, and campus operations, enabling sustainability principles and planetary health considerations to consistently inform institutional planning, investment decisions, and programme design. Knowledge generated through research and community engagement is systematically synthesised and translated into operational practices, pilots, and decision-ready insights. Campus and community living laboratories function as integral components of this system, generating practice-based evidence that strengthens institutional learning.

Institutional coherence is further reinforced through common sustainability narratives, indicators, and monitoring processes, enabling aggregation of impact at the institutional level rather than reliance on fragmented project-level reporting. Decision-making increasingly reflects systems thinking, ethical judgement, and long-term stewardship. As a result, UPM functions as an integrated learning organisation where sustainability is embedded as a core operational logic, strengthening its capacity for sustained planetary health leadership.

Outcome 2 Strengthened Policy, Practice, and Societal Impact through Institutional Wisdom

A second key outcome is the transformation of UPM's societal engagement from dispersed expert contributions to an institutionalised sustainability wisdom and advisory capability. UPM aspires to consistently translate integrated knowledge and operational insights into policy-relevant, socially grounded guidance for government, industry, and communities.

This outcome enhances the quality, coherence, and legitimacy of sustainability-related decisions across multiple levels. Policy briefs, advisory reports, transition roadmaps, and implementation frameworks are informed by systems analysis and tools such as Psychosocial Impact Assessment (PSIA), ensuring that equity, behavioural dynamics, and local context are embedded in sustainability interventions. Communities and stakeholders are engaged as co-producers of knowledge rather than passive recipients, strengthening ownership, trust, and long-term effectiveness.

Measurable societal impacts emerge through improved environmental stewardship, more resilient food and socio-ecological systems, and better-aligned sustainability policies and practices. UPM's role evolves from knowledge provider to trusted intermediary, reinforcing its relevance within Malaysia's sustainability governance ecosystem and supporting inclusive, evidence-informed planetary health transitions.



Outcome 3 Consolidating Institutional Learning, Ethical Leadership, and Global Standing

The third outcome is the consolidation of UPM's long-term institutional resilience through reflexive learning, ethical leadership, and adaptive capacity. By embedding Reflexive Monitoring and Learning (across initiatives, the university systematically captures lessons from implementation, evaluates outcomes and unintended effects, and feeds insights back into strategy, leadership development, and operational improvement.

This outcome reduces dependence on individual champions by institutionalising sustainability literacy, systems thinking, and knowledge translation competencies across staff, leaders, and students. Leadership practices are increasingly guided by ethical responsibility, transparency, and intergenerational accountability, safeguarding institutional integrity amid complex planetary challenges.

Over time, these capabilities strengthen UPM's national and international standing. UPM is recognised not only for sustainability performance, but for its ability to integrate knowledge, practice, advisory roles, and learning into a coherent institutional wisdom model. This positions the university as a regional reference institution for planetary health and sustainability, capable of contributing credible insights, adaptive solutions, and leadership to global sustainability dialogues while remaining firmly grounded in local and national contexts.





Key Initiative Indicator Outcomes

Key Initiative Outcome 1 Institutionalised Knowledge-to- Decision Coherence

Institutional Sustainability Integration Coverage measures the extent to which sustainability and planetary health indicators are embedded across UPM's governance, planning, and quality assurance systems. This includes the proportion of faculties, institutes, centres, and administrative units that integrate sustainability key performance indicators into annual planning, performance reviews, and institutional reporting mechanisms. It reflects the degree to which sustainability is institutionalised as a shared operational logic rather than implemented through isolated projects.

Knowledge-to-Decision Outputs assesses the number and quality of decision-ready outputs generated through UPM's knowledge integration platforms, including policy briefs, technical guidelines, implementation toolkits, evidence-based frameworks, advisory notes, and scalable intervention models. These outputs demonstrate the university's ability to synthesise research, innovation, local and indigenous knowledge, and operational experience into actionable forms that support institutional decision-making and external engagement.

Operational Uptake of Sustainability Evidence and Innovation measures the extent to which UPM-generated knowledge, pilot interventions, and living laboratory outputs are translated into institutional practice, operational improvement, or scaled implementation. This may be tracked through the number of sustainability-related innovations adopted within campus operations, the proportion of pilot projects informing policy or management decisions, and documented examples of research-informed solutions applied across priority domains such as food security, biodiversity conservation, climate adaptation, and human-environment interactions. Together, these indicators assess UPM's capacity to transform accumulated knowledge into coherent institutional action.

Key Initiative Outcome 2 Strengthened Policy, Practice, and Societal Impact through Institutional Wisdom

Sustainability Advisory and Policy Engagement Outputs measures the volume and scope of formal advisory contributions delivered by UPM to government ministries, agencies, local authorities, industries, and communities. These may include policy briefs, transition roadmaps, regulatory support tools, psychosocial impact assessments, technical advisory reports, sustainability frameworks, and implementation guidelines. The indicator reflects the institutionalisation of UPM's advisory function as a structured pathway for bridging science, policy, and society.

Stakeholder Co-Creation and Beneficiary Reach assesses the breadth and depth of participatory engagement across defined beneficiary groups, including government agencies, local authorities, smallholders, farmers, agri-entrepreneurs, communities, vulnerable groups, industries, schools, youth networks, regional partners, and international collaborators. It may be measured through the number of co-developed initiatives, stakeholder engagement platforms, participatory advisory processes, demonstration projects, capacity-building programmes, and collaborative knowledge translation activities undertaken across these groups. This indicator captures the extent to which advisory practice is grounded in inclusivity, local context, and shared ownership.

Societal Uptake and Impact of UPM Advisory Contributions measures the extent to which UPM's advisory outputs, tools, and evidence-informed recommendations are adopted, referenced, or applied by external stakeholders in policy development, programme implementation, community interventions, or sectoral practices. Evidence may include documented policy influence, adoption of technical recommendations, implementation of community-based solutions, use of Psychosocial Impact Assessment in planning and governance, and the continuation or scaling of advisory partnerships. Collectively, these indicators evaluate UPM's contribution to more resilient, equitable, and sustainability-oriented policy and practice ecosystems.

Key Initiative Outcome 3 Consolidating Institutional Learning, Ethical Leadership, and Global Standing

Reflexive Monitoring and Learning Institutionalisation measures the extent to which UPM embeds continuous learning systems across sustainability initiatives, advisory engagements, and operational programmes. This includes the establishment of standardised monitoring protocols, digital dashboards, faculty-level reporting mechanisms, learning loops, periodic reviews, and institutional processes that capture lessons learned, unintended effects, failures, and best practices. The indicator reflects UPM's ability to use evidence and reflection to refine strategy, guide resource allocation, and strengthen adaptive governance over time.

Sustainability Literacy, Systems Thinking, and Ethical Leadership Capacity assesses participation and competency development among staff, students, and leaders through structured training, professional development, leadership programmes, experiential learning, living laboratories, community immersion, and participatory research. It may be measured through the number of individuals trained, the integration of institutional wisdom-related

competencies into staff and student development pathways, and the extent to which systems thinking, ethical judgement, knowledge translation, and intergenerational responsibility are embedded across institutional programmes. This indicator captures the human and cultural foundations necessary for sustained transformation.

Recognition and Visibility of UPM's Institutional Wisdom Model measures the university's growing standing as a regional and global reference institution for planetary health, sustainability wisdom, and knowledge-to-impact pathways. This may be assessed through the production of institutional impact reports, participation in regional and international sustainability networks, development of multi-country research or advisory collaborations, invitations to contribute to policy dialogues, benchmarking exercises, strategic alliances, and broader recognition of UPM's integrated model of knowledge, practice, advisory engagement, and reflexive governance. Together, these indicators assess whether institutional wisdom is becoming a durable source of resilience, leadership, and international relevance for UPM.





Key Action Plan

Action Plan 1 Enhancing Sustainability Integration in Institutional Platforms (2026–2028)

UPM will consolidate sustainability governance structures to enhance coherence across its academic, operational, and community engagement functions. A coordinated Sustainability Integration Framework will guide implementation across faculties and centres, ensuring alignment with the Blueprint. Digital dashboards will standardise monitoring of institutional indicators such as carbon emissions, SDG-linked research outputs, and community impact metrics. Faculties will integrate sustainability KPIs into annual planning cycles and quality assurance processes. This action establishes the institutional foundation required to mainstream sustainability throughout the university ecosystem.

Action Plan 2 Translating Accumulated Institutional Knowledge, Expertise and Innovation into Actionable Practice and Solutions

UPM aimed to systematically translate sustainability research into actionable policies, technologies, and community-based solutions. This system will comprehensively map UPM's expertise, streamline structured engagement with government and industry stakeholders, and establish standardised pathways for producing high-impact outputs such as policy briefs, technical guidelines, advisory notes, and evidence-based frameworks. Innovation sandboxes and demonstration sites will be developed to enable real-world testing, validation, and scaling of solutions in priority domains including food security, biodiversity conservation, climate adaptation, and human-environment coexistence. Central to this initiative is the strategic engagement of clearly defined beneficiary groups to ensure context-sensitive and outcome-driven outreach.



Government ministries and agencies will be supported through the development of evidence-based policy briefs on food system resilience, climate adaptation, biodiversity protection, and public health–environment linkages, alongside technical advisory services aligned with national strategies such as DAN 2.0, RMK-12 implementation, and state climate action plans. Capacity-building programmes will further strengthen institutional competencies in planetary health assessments, sustainable land-use governance, and One Health integration.

Smallholders, farmers, agri-entrepreneurs, and cooperative groups will benefit from demonstration plots showcasing sustainable and precision agriculture, climate-resilient crop management, and advanced livestock and aquaculture practices, complemented by structured training on soil health, water efficiency, pest and disease forecasting, post-harvest optimisation, and adoption of UPM-developed innovations such as smart farming tools, biological controls, and feed technologies.

Local communities and vulnerable groups, including B40 households, indigenous populations, peri-urban settlements, and climate-exposed communities, will be engaged through participatory research, community workshops on food safety and nutrition security, co-designed solutions for water access and waste management, and resilience-oriented Living Lab platforms that promote behavioural change and environmental stewardship.

Industry partners across agrifood, plantation, renewable energy, environmental consultancy, and green technology sectors will collaborate in piloting circular economy applications, resource-efficiency approaches, and low-carbon technologies, while also receiving certification-linked training in sustainable supply chain management, biosafety, biosecurity, ESG reporting, and sustainability governance.

Schools and youth networks will be engaged through Education for Sustainable Development (ESD) modules, planetary health outreach programmes, innovation challenges addressing climate and food systems, and teacher capacity-building initiatives that embed systems thinking and sustainability pedagogy.

Local authorities and urban managers will receive technical guidance on urban agriculture, green infrastructure, biodiversity corridors, waste management, climate-resilient urban development, and the deployment of monitoring tools such as heat maps, pollution dashboards, and risk assessment frameworks.

At the regional and international levels, partnerships with ASEAN bodies, UN agencies, foreign universities, and global sustainability alliances will facilitate joint research programmes, co-taught courses, dual-degree arrangements, mobility schemes, and multi-country comparative studies that generate global benchmarking insights. Students and alumni will play an active role as knowledge intermediaries, strengthening the mobilisation and societal application of UPM's expertise across diverse sectors. Through these integrated and structured mechanisms, this action bridges the gap between academic outputs and real-world impact, ensuring that UPM's knowledge assets are systematically channelled towards advancing national development agendas and global sustainability priorities.





Action Plan 3 Embedding Sustainability practices to bridge science and society at all levels of engagement

UPM will formalise its advisory services through a structured unit responsible for coordinating requests, mobilising expert panels, and integrating Psychosocial Impact Assessment (PSIA) as a standard analytical tool. PSIA will be applied as a rigorous process that examines the potential effects of policies, projects, environmental changes, or crises on mental health, emotional well-being, and social structures. It evaluates how disruptions influence individuals' *lifescape* (the interaction between people and their socio-environmental settings), lifestyle (daily practices, routines, and behavioural patterns), and lifestrain (the pressures and stresses experienced as a result of social or environmental change). By assessing these dimensions, PSIA helps anticipate risks, mitigate adverse consequences, and strengthen adaptive capacities at the individual and community levels. The process may be conducted prospectively informing planning and preventive actions or retrospectively, drawing lessons from past events to improve future governance.

The advisory unit will develop a repository of methodologies, case studies, and evidence resources to guide engagements with government ministries, industries, local authorities, and communities. Strategic collaborations will support the co-development of regulatory measures, risk assessments, and sustainability transition plans informed by the behavioural, socio-cultural, and psychosocial factors that shape societal responses to change. Community engagement protocols will prioritise inclusivity, equity, and socio-cultural sensitivity, ensuring that advisory outputs reflect the lived realities of affected populations. Through the integration of PSIA and social science perspectives, this action enhances the relevance, ethical grounding, and societal responsiveness of UPM's advisory functions, strengthening the university's role as a national reference institution for sustainability governance.

Action Plan 4 Continuous improvement and refined practice to achieve sustainability goals

UPM will institutionalise Reflexive Monitoring and Learning as a core organisational capability. This action ensures that sustainability initiatives, advisory engagements, and operational pilots are continuously evaluated, reflected upon, and improved.

Standardised RM-protocols will be applied across faculties and units to capture outcomes, unintended effects, failures, and best practices. Lessons learned will be systematically fed back into strategy refinement, leadership development, curriculum enhancement, and operational decision-making. Communities of practice will facilitate cross-unit learning and reduce dependence on individual champions.

Monitoring will move beyond output counting towards assessment of decision quality, behavioural change, institutional coherence, and long-term planetary health implications. This reflexive approach strengthens UPM's adaptive capacity, ensuring relevance amid evolving planetary, societal, and policy conditions.



Action Plan 5 Strengthen Sustainability Literacy, Systems Thinking, and Ethical Leadership

UPM will implement a university-wide sustainability literacy and leadership development programme aligned with institutional wisdom principles. This action focuses on building the human and cultural foundations required for sustained transformation.

Training modules will address systems thinking, planetary health principles, ethical judgement, policy engagement, and knowledge translation. These will be embedded within curricula, professional development pathways, and leadership programmes. Experiential learning through living labs, community immersion, and participatory research will be emphasised to cultivate reflexive and responsible leadership.

Leadership development will prioritise long-term stewardship, transparency, and intergenerational responsibility. By institutionalising these competencies, UPM ensures that institutional wisdom is not person-dependent but embedded across generations of staff and students.

Collectively, these five Key Action Plans operationalise Strategic Outcome 3 by translating institutional and local wisdom into governance structures, operational systems, advisory practices, learning mechanisms, and leadership culture. They provide the practical foundation through which UPM becomes a coherent, adaptive, and trusted transformative agent for planetary health and sustainability.





Klinik Pertanian Putra

UPM adopts a community-based participatory approach through Klinik Pertanian Putra, integrating scientific research with local knowledge. The programme provides advisory services, field consultations, and technical training to farmers while incorporating traditional practices. In 2025, the initiative engaged over 300 farmers across 15 communities, delivering more than 50 advisory sessions. Local practices such as composting and natural pest control are enhanced with soil analysis and integrated pest management techniques. Farmers' climate observations are also aligned with scientific data to improve crop planning. This approach has increased farm productivity, reduced environmental impact, and strengthened community resilience, demonstrating UPM's role in advancing inclusive and sustainable agricultural development.



SISFEC UPM – Green Campus & Biodiversity Conservation Programme

The Supervised Integrated Sustainable Forest Education Centre (SISFEC) at Ayer Hitam Forest Reserve operationalises UPM's sustainability agenda by integrating research, education, and community engagement in forest conservation. As a living laboratory, SISFEC supports evidence-based policy on biodiversity protection and climate action (SDG 13, SDG 15). It delivers hands-on training in forest restoration, biodiversity monitoring, and sustainable resource management. Community outreach programmes, including environmental education and tree planting, strengthen public stewardship. This initiative demonstrates measurable impact through ecosystem conservation, enhanced carbon sequestration, and capacity building, positioning UPM as a national leader in translating institutional knowledge into sustainable practice and societal benefit.



Suggested Roadmap

Key Initiative	Intended 10 Year Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Transformation 2032 to 2035
K1. Integrated Knowledge and Innovation Transfer Programme	Institutionalised knowledge-to-decision coherence, where sustainability-related research, innovation, operational practice, and governance are systematically connected through shared frameworks, translation pathways, and feedback mechanisms.	1. Enhancing Sustainability Integration in Institutional Platforms (2026–2028) 2. Translating Accumulated Institutional Knowledge, Expertise and Innovation into Actionable Practice and Solutions	Formalise the institutional architecture for sustainability integration; operationalise the Sustainability Integration Framework and digital dashboards; map institutional expertise, innovation assets, and knowledge platforms; develop structured training modules for knowledge intermediaries; establish baseline assessments for sustainability integration, SDG-linked research, and knowledge translation systems.	Fully deploy the Knowledge Integration and Knowledge-Informed Operations system across faculties and centres; scale demonstration and innovation sites in food security, climate resilience, biodiversity, and related domains; strengthen interdisciplinary clusters aligned with planetary health priorities; intensify institutional monitoring, reporting, and strategic communication of sustainability performance.	Institutionalise coherent knowledge-to-decision pathways across UPM; consolidate long-term translation mechanisms linking research, operations, and governance; produce analytical and benchmarking outputs that demonstrate UPM's institutional wisdom model; sustain adaptive use of evidence for strategic decision-making and institutional resilience.

Suggested Roadmap

Key Initiative	Intended 10 Year Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Transformation 2032 to 2035
K2. Multilevel Sustainability Wisdom and Advisory Practice	Strengthened policy, practice, and societal impact through a coordinated institutional advisory function that translates UPM's expertise into socially grounded, policy-relevant, and context-sensitive solutions.	1. Embedding Sustainability practices to bridge science and society at all levels of engagement. 2. Continuous improvement and refined practice to achieve sustainability goals	Institutionalise the Multilevel Sustainability Advisory Practice, including PSIA as a standard tool; conduct PSIA capacity-building for staff involved in advisory and community engagement; initiate pilot advisory engagements with ministries, agencies, and local authorities; establish early mechanisms for policy translation and structured stakeholder engagement.	Expand advisory services to state-level agencies, industries, and multi-stakeholder coalitions; develop sector-specific guidelines, policy briefs, and technical advisories informed by PSIA; strengthen co-created projects with communities, industries, schools, youth networks, local authorities, and external partners; broaden international collaboration through joint programmes and partnerships.	Consolidate long-term advisory partnerships across government, industry, and civil society; mature community, industry, and government partnerships into sustained co-creation platforms; contribute to regional and global sustainability dialogues through policy-relevant analytical outputs; strengthen UPM's standing as a trusted reference institution for planetary health and sustainability advisory practice.



Suggested Roadmap				
Key Initiative	Intended 10 Year Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031 Phase 3: Transformation 2032 to 2035
K3. Internal Learning Partnerships and Capacity Building Programmes	Consolidated institutional learning, ethical leadership, and adaptive capacity, enabling UPM to function as a reflexive, wisdom-driven, and globally relevant institution for planetary health and sustainability.	Strengthen Sustainability Literacy, Systems Thinking, and Ethical Leadership	Launch university-wide sustainability literacy and leadership programmes; develop internal learning partnerships and baseline capacities for reflexive governance; establish monitoring and learning mechanisms that capture institutional progress, lessons, and gaps; initiate international mobility, visiting scholar, and staff exchange programmes to strengthen learning networks.	Integrate sustainability KPIs into governance, budgeting, and performance management systems; implement Living Labs and experiential learning platforms university-wide; expand fellowships, staff exchanges, and international research residencies; strengthen communities of practice, cross-unit learning, and institutional feedback loops. Achieve university-wide adoption of reflexive governance and continuous learning systems; fully embed sustainability literacy and leadership competencies in curricula and staff development frameworks; institutionalise the UPM Planetary Health and Sustainability Impact Report; conduct periodic strategic reviews to strengthen adaptive governance, ethical leadership, and long-term institutional resilience.

Strategic Outcome 4: UPM as a Referral Point and a Regional Leader

Strategic Outcome 4 positions UPM as a recognised regional reference institution in planetary health and sustainability. This outcome envisions UPM not merely as an institution that participates in programmes and projects, but as one that is consistently acknowledged as a credible knowledge authority and a preferred strategic partner in policy formulation, governance advancement, and regional collaboration. In this regard, SO4 represents a strategic elevation of UPM's institutional role, from operational engagement to recognised thought leadership and policy influence within national and regional sustainability ecosystems.

The essence of SO4 lies in institutional legitimacy and influence. It aspires to ensure that UPM's contributions in planetary health and sustainability are embedded within formal governance structures, policy frameworks, and strategic development agendas. Rather than limiting impact to project-based outputs, SO4 seeks to position UPM as a reference point, an institution whose expertise is formally consulted, whose research informs strategic documents, and whose leadership is visible within regional platforms shaping sustainability discourse and implementation.

Operationally, the realisation of SO4 is anchored in three mutually reinforcing pathways. First, UPM strengthens high-impact formal partnerships with ministries and public agencies, ensuring that collaborative arrangements extend beyond ceremonial Memoranda of Understanding (MoUs) into sustained co-implementation mechanisms. These partnerships are structured around joint technical working groups, policy advisory engagements, collaborative research initiatives, and measurable outcomes that demonstrate tangible governance and policy impact. The focus is on long-term institutional alignment and structured knowledge transfer that enhances national and regional capacity in planetary health and sustainability.

Second, SO4 advances the development of a multi-institutional ONE-Planet collaborative network characterised by shared leadership, long-term knowledge exchange, and cross-border cooperation. Through this framework, UPM serves as a convener and co-anchor of collaborative ecosystems that integrate universities, government agencies, industry partners, and international organisations. The network facilitates joint research clusters, capacity-building initiatives, co-developed sustainability solutions, and structured academic and policy dialogues. By institutionalising collaboration rather than relying on ad hoc engagements, UPM strengthens its regional standing as a coordinating and knowledge-sharing hub.

Third, SO4 emphasises visible and substantive leadership within national and regional governance platforms. This includes active participation and representation in advisory councils, expert panels, technical committees, and sustainability task forces. Such visibility must translate into formal recognition—where UPM's expertise is referenced in strategic frameworks, policy documents, and national roadmaps related to planetary health and sustainable development. Through this mechanism, UPM's institutional voice becomes integrated within the architecture of governance, reinforcing its reputation as a regional authority.

These pathways ensure that UPM's engagement in planetary health and sustainability transcends programme-level activity and evolves into institutionalised leadership. SO4 thus embodies a strategic commitment to positioning UPM as a regional centre of reference, an institution whose research, governance expertise, and collaborative capacity shape sustainable development trajectories across Malaysia and the broader region.



Strategic Outcome 4 positions UPM as a recognised regional reference institution for planetary health and sustainability where UPM is not only active in programmes and projects but is consistently referred to as a credible knowledge authority and a preferred partner in policy, governance, and regional collaboration.

Operationally, SO4 is achieved by strengthening three interlocking pathways:

1. High-impact formal partnerships with ministries and public agencies that move beyond ceremonial MoUs into sustained co-implementation and policy collaboration;
2. A multi-institutional ONE-Planet collaborative network with shared leadership and long-term knowledge exchange; and
3. Visible leadership roles in national and regional governance platforms, resulting in formal recognition of UPM's expertise in strategies, frameworks, and policy documents.

SO4 matters because planetary health challenges—climate risks, food insecurity, transboundary haze, zoonotic diseases, biodiversity loss, ageing societies, and widening health inequities are regional, cross-sectoral, and policy-dependent. Without institutional anchors that can convene, coordinate, and translate knowledge into governance action, sustainability efforts remain fragmented and slow. For UPM, SO4 matters for four strategic reasons:

- a. National relevance and policy responsibility – As a leading public research university with strong assets in agriculture, environment, health, and community engagement, UPM has both the capability and responsibility to support ministries and agencies with evidence, solutions, and implementation capacity.
- b. ASEAN-level positioning and competitive differentiation – Regional leadership is increasingly defined by who can provide trusted frameworks, data, advisory capacity, and convening power. SO4 differentiates UPM as a regional problem-solver and policy reference, not just a programme implementer.

- c. Systems impact through coordinated networks – Planetary health requires multi-stakeholder action. The ONE-Planet approach enables shared leadership, joint agenda-setting, and continuity beyond project cycles—creating durable knowledge exchange and coordinated implementation pathways.
- d. Credibility, visibility, and long-term influence – Being “referred” as a trusted institution in official documents and frameworks is a higher-order indicator of credibility. It strengthens UPM's reputation, unlocks strategic partnerships, and increases the likelihood that UPM's science and innovation are used in decision-making.

Current Scenario

UPM already demonstrates strong institutional foundations to advance Strategic Outcome 4 (SO4). The University possesses a mature and diversified ecosystem comprising faculties, research institutes, centres of excellence, living laboratories, and community outreach platforms that collectively support transdisciplinary approaches to planetary health and sustainability. This integrated academic and operational landscape enables UPM to bridge scientific research, social innovation, policy analysis, and community engagement within a coherent institutional framework. Such structural depth provides a robust platform for developing holistic and systems-based solutions aligned with regional sustainability priorities.

In addition, UPM has established significant national engagement capacity through sustained collaboration with ministries, public agencies, industry partners, and local communities. Its involvement in community transformation initiatives, industry-linked research, and applied policy advisory activities reflects an institutional readiness to operate beyond conventional academic boundaries. Complementing this is the University's growing visibility through sustainability-driven initiatives, benchmark participation, and

strategic positioning within national development agendas. These developments collectively signal institutional momentum and readiness to scale impact beyond domestic engagement.

Nevertheless, transitioning from national strength to regional authority requires deliberate structural enhancement. To become a recognised regional referral point in planetary health and sustainability, UPM must strengthen coordination and shared governance mechanisms across faculties, institutes, and external partners. Without structured alignment, collaboration risks becoming silo-driven, fragmented, and personality-dependent. A more integrated governance architecture, anchored in shared priorities, measurable outcomes, and collective ownership, will be essential to ensure coherence and sustained regional engagement.

Furthermore, institutionalised leadership presence within policy forums, advisory councils, and technical working groups must be prioritised. Representation should move beyond ad hoc attendance or invitation-based participation toward formally embedded roles that position UPM as a consistent contributor to policy deliberation and strategic decision-making. Sustained visibility within governance platforms is critical in reinforcing institutional credibility and influence.

Equally important is the systematic production of evidence-based knowledge products that translate research and practice into authoritative outputs. Position papers, policy briefs, technical guidelines, white papers, and co-developed frameworks must be generated in a structured and strategic manner. These outputs should not only disseminate knowledge but also lead to formal citation, acknowledgement, and integration of UPM's expertise within national and regional policy documents. Such recognition is a defining characteristic of a true regional reference institution.

In essence, UPM possesses the institutional assets, expertise, and engagement capacity required to lead in planetary health and sustainability. SO4 provides the structured and strategic pathway

to convert these assets into sustained regional authority and measurable policy influence. Through strengthened governance coordination, institutionalised leadership presence, and systematic knowledge production, UPM can transition from a capable national actor to a formally recognised regional centre of reference.

UPM already demonstrates strong foundations to advance SO4:

- A mature ecosystem of faculties, institutes, living laboratories, and outreach platforms that can support transdisciplinary planetary health solutions.
- Established national engagement capacity through community and industry programmes.
- Growing visibility and institutional momentum through sustainability initiatives and benchmark participation.

However, to become a regional referral point, UPM must strengthen:

- Coordination and shared governance across institutions and partners (to avoid silo-driven collaboration),
- Institutionalised leadership presence in policy forums and working groups (not ad hoc attendance), and
- Systematic evidence and knowledge products (position papers, policy briefs, co-developed guidelines) that lead to UPM being formally cited or recognised in frameworks.

In short: UPM has the assets, SO4 provides the structured pathway to convert assets into regional authority and policy influence.



Key Initiatives

Key Initiative 1 Strategic Networking with Stakeholders

Strategic Networking with Stakeholders (K1) is designed to reposition UPM from a collaborating university to a trusted governance partner in planetary health and sustainability. This initiative emphasises the development of deep, mission-driven partnerships with ministries, public agencies, regulatory bodies, and strategic industry actors. The objective is not merely to formalise relationships through Memoranda of Understanding but to institutionalise sustained co-implementation, joint policy advisory roles, and structured technical collaboration. Through this approach, UPM's expertise becomes embedded within planning committees, policy working groups, and implementation task forces that shape national and regional sustainability agendas.

K1 requires a deliberate shift from transactional engagement to strategic alignment. Partnerships must be anchored in shared objectives, measurable outcomes, and long-term institutional commitment. This includes co-developing policy frameworks, producing joint research outputs that inform governance decisions, and contributing technical expertise to sustainability strategies and regulatory guidelines. By positioning its academics and researchers within formal advisory capacities, UPM strengthens its institutional legitimacy and policy visibility.

Ultimately, K1 enhances UPM's credibility as a sustainability governance partner. When ministries and agencies consistently consult UPM for expert input and policy direction, the university transitions from project-level contributor to recognised authority. This transformation is fundamental to establishing UPM as a regional reference institution under Strategic Outcome 4.

Key Initiative 2 Global Partnership through UPM Planetary Health & Sustainability Gateway

K2 envisions the establishment of UPM as a regional digital and knowledge gateway for planetary health and sustainability. Through the UPM Planetary Health & Sustainability Gateway, the University will integrate data, performance tracking mechanisms, research outputs, and collaborative platforms into a coherent ecosystem that supports informed decision-making and regional cooperation. The Gateway functions not only as a digital repository but as a strategic interface connecting academia, policymakers, industry partners, and international institutions.

This initiative strengthens UPM's regional positioning by enhancing transparency, accessibility, and evidence-based governance. By consolidating sustainability indicators, research findings, living laboratory outcomes, and partnership data within an integrated platform, UPM demonstrates institutional maturity and accountability. The Gateway also enables benchmarking, monitoring of strategic initiatives, and real-time knowledge exchange across partner institutions. Such infrastructure reinforces UPM's role as a coordinating hub for collaborative sustainability efforts.

Beyond digital integration, K2 promotes structured regional collaboration through shared analytics, joint publications, and cross-border knowledge dissemination. As the Gateway becomes a recognised source of credible sustainability intelligence, UPM's institutional authority expands. The University evolves into a reference point for performance tracking, policy support, and strategic dialogue in planetary health—thereby consolidating its regional leadership status under SO4.

Key Initiative 3 Strengthening Communication, Education & Public Awareness (CEPA)

Strengthening Communication, Education, and Public Awareness (CEPA) under K3 aims to institutionalise sustainability advocacy and societal engagement as a core strategic function of UPM. This initiative recognises that regional authority is not built solely through policy and governance engagement, but also through public trust, youth empowerment, and visible thought leadership. By embedding CEPA within institutional structures, UPM ensures that sustainability knowledge is translated into accessible, impactful communication that resonates beyond academia.

K3 promotes structured engagement with schools, youth organisations, civil society, and community stakeholders through educational programmes, public forums, policy dialogues, and digital campaigns. Youth participation is prioritised as a transformative force in advancing planetary health values and sustainability literacy. Through mentorship programmes, student-led initiatives, and international youth collaborations, UPM nurtures the next generation of sustainability leaders while strengthening its global visibility.

Moreover, strategic communication amplifies UPM's research contributions, policy insights, and governance roles across national and regional platforms. Consistent publication of position statements, expert commentaries, and public knowledge products enhances institutional credibility. When UPM becomes widely recognised as a thought leader shaping sustainability discourse, its influence extends beyond institutional boundaries. In this way, K3 reinforces UPM's societal impact, global presence, and legitimacy as a regional authority in planetary health and sustainability.

K1: Strategic Networking with Stakeholders – Build deep, mission-driven partnerships with ministries and public agencies, and strengthen UPM's credibility as a sustainability governance partner.

K2: Global Partnership through UPM Planetary Health & Sustainability Gateway – Establish UPM as a regional digital and knowledge gateway—supporting performance tracking, decision-making, and regional collaboration through integrated platforms.

K3: Strengthening Communication, Education & Public Awareness (CEPA) – Institutionalise CEPA and youth engagement to build societal impact, global visibility, and thought leadership—reinforcing UPM's credibility and influence.

Key Initiative Outcome

Key Initiative Outcome 1 Stakeholder and Governance Impact

Outcome 1 reflects UPM's successful institutional embedding within policy and implementation ecosystems related to planetary health and sustainability. Under this outcome, UPM is not positioned as an external academic observer but as an integrated governance partner contributing to structured decision-making processes. Through formalised partnerships, advisory appointments, technical committee representation, and sustained co-implementation mechanisms, the University plays an active and coordinated role in shaping and executing sustainability priorities at national and regional levels.



This embedding ensures that UPM's expertise informs regulatory frameworks, development plans, sustainability guidelines, and cross-sectoral strategies. Rather than operating through fragmented or ad hoc engagement, UPM's involvement is institutionalised within governance architectures, enabling continuity, accountability, and measurable policy impact. The result is a coordinated approach to planetary health priorities, where academic evidence, community engagement, and policy implementation are aligned within shared strategic platforms. Outcome 1 therefore represents a structural shift from episodic collaboration to sustained governance influence.

Key Initiative Outcome 2 Regional Collaboration and Knowledge Exchange

Outcome 2 envisions the ONE-Planet framework functioning as a sustained, multi-institutional ecosystem that facilitates shared leadership and structured knowledge exchange. Under this outcome, collaboration extends beyond bilateral agreements toward a networked model of cooperation anchored in long-term programming, joint research initiatives, and coordinated capacity-building efforts. The ONE-Planet ecosystem integrates universities, ministries, civil society organisations, and international partners within a coherent collaborative platform.

This ecosystem supports cross-border dialogue, joint policy experimentation, co-developed sustainability solutions, and reciprocal expertise sharing. By institutionalising collaboration through defined governance mechanisms and shared performance tracking, the network avoids fragmentation and dependency on individual champions. Instead, it fosters durable partnerships and collective ownership of regional sustainability agendas. Through sustained programming and systematic knowledge dissemination, ONE-Planet becomes a recognised platform for regional cooperation, reinforcing UPM's leadership role in planetary health discourse.

Key Initiative Outcome 3 Credibility and Reference Status

Outcome 3 reflects the ultimate institutional aspiration of Strategic Outcome 4: the formal recognition of UPM as a trusted reference institution in planetary health and sustainability. This recognition is evidenced through citations, acknowledgements, and direct incorporation of UPM's expertise within national and regional strategies, policy frameworks, technical guidelines, and governance roadmaps.

Under this outcome, UPM's research outputs, policy briefs, and advisory contributions transcend academic dissemination and become embedded within formal documentation shaping sustainability action. Recognition may take the form of explicit citation in strategic plans, appointment to high-level advisory councils, or formal partnership roles in regional frameworks. Such acknowledgement signals institutional credibility and authoritative standing. Outcome 3 therefore represents the consolidation of UPM's transformation—from an engaged contributor to a formally recognised regional centre of reference and influence in planetary health governance.

Outcome 1 (Stakeholder & Governance Impact):

UPM is embedded in policy and implementation ecosystems through structured partnerships, advisory roles, and governance leadership—enabling coordinated action on planetary health priorities.

Outcome 2 (Regional Collaboration & Knowledge Exchange):

ONE-Planet functions as a sustained, multi-institutional ecosystem that supports shared leadership, joint programming, and durable knowledge exchange.

Outcome 3 (Credibility & Reference Status):

UPM is recognised as a trusted reference institution, reflected through citations and recognition in national/regional strategies, frameworks, and policy documents.

Key Initiative Indicators

Key Initiative Indicator 1 Strategic Networking with Stakeholders

Strengthened UPM collaborative ecosystem, enhanced institutional visibility and credibility, and expanded resource and innovation opportunities

This Key Initiative Outcome reflects the intended transformation of UPM's stakeholder engagement from conventional collaboration into a more strategic, structured, and high-impact institutional ecosystem. Under K1, the focus is not merely on increasing the number of partnerships, but on improving their depth, relevance, and long-term value in advancing planetary health and sustainability. Therefore, the outcome is appropriately centred on strengthening UPM's collaborative ecosystem in ways that enhance institutional credibility, visibility, and access to broader opportunities.

A stronger collaborative ecosystem means that UPM is able to build durable and mission-driven relationships with ministries, public agencies, industry, civil society, communities, and international institutions. These relationships go beyond ceremonial agreements and evolve into platforms for joint implementation, policy dialogue, technical cooperation, research translation, and shared problem-solving. As such collaborations mature, UPM's institutional presence becomes more visible within governance and sustainability platforms, strengthening the University's reputation as a trusted and capable strategic partner.

This outcome also supports the expansion of resource and innovation opportunities. Through stronger networks, UPM is better positioned to access collaborative grants, cross-sector funding, policy influence, co-supervision arrangements, research alliances, and innovation-driven partnerships that can accelerate impact. More importantly, these partnerships reinforce UPM's legitimacy within national and regional sustainability ecosystems.

In essence, this KII captures the core purpose of K1: to reposition UPM from a participating institution into a recognised collaborative anchor in planetary health and sustainability. When partnerships become deeper, more strategic, and more influential, UPM not only strengthens its network but also its standing as a credible regional actor whose expertise is sought, valued, and embedded in broader governance and development processes.

Key Initiative Indicator 2 Global Partnership through UPM Planetary Health & Sustainability Gateway

UPM Planetary Health and Sustainability Global Gateway to enhance regional and global engagement and increase UPM's influence on regional and global sustainability and planetary health agendas

This Key Initiative Outcome reflects UPM's aspiration to function as a regional and global gateway for planetary health and sustainability knowledge, data, collaboration, and strategic engagement. Under K2, the emphasis is on establishing an integrated digital and knowledge ecosystem that does more than store information. The Gateway is intended to serve as a strategic platform that connects institutions, supports evidence-based decision-making, strengthens international cooperation, and enhances UPM's influence in shaping sustainability agendas.

The outcome is therefore aligned with the core intent of K2: to position UPM as a credible hub that facilitates regional and global engagement through digital infrastructure, shared intelligence, and coordinated knowledge exchange. By integrating key sustainability networks, datasets, performance indicators, and collaboration platforms, the Gateway becomes an institutional mechanism that supports transparency, interoperability, and informed action across multiple sectors and geographies. This elevates UPM's role from that of a knowledge producer to that of a knowledge connector, convenor, and enabler.



Importantly, this KII also reflects strategic influence. As the Gateway becomes operational and widely used by local, regional, and international partners, UPM's institutional authority in planetary health and sustainability is strengthened. It creates a visible and accessible entry point through which partners can engage with UPM's expertise, datasets, policy outputs, and collaborative initiatives. In this way, the Gateway increases both engagement and influence.

Ultimately, this KII captures the value of K2 in institutional terms. It signals that UPM is building not only a digital platform, but also a regional knowledge architecture that can shape conversations, support partnerships, and reinforce the University's standing as a trusted reference point in sustainability and planetary health across ASEAN and beyond.

Key Initiative Indicator K3 Strengthening Communication, Education & Public Awareness (CEPA)

Communication, education, and awareness initiatives cultivate an informed and responsible campus and community culture, elevate UPM's visibility, and drive sustained behavioural transformation that supports long-term planetary health and sustainability goals

This Key Initiative Outcome reflects the broader societal and institutional purpose of K3, which is to embed planetary health and sustainability not only within policy and partnership structures, but also within culture, values, behaviour, and public understanding. Under K3, communication, education, and public awareness are treated as strategic instruments for institutional transformation. The goal is to ensure that sustainability is not perceived as a technical agenda alone, but as a shared institutional and societal responsibility.

The outcome is closely aligned with this intent. Through sustained CEPA efforts, UPM can cultivate a campus and community culture that is more informed, more responsible, and more engaged with planetary health challenges and solutions.

This includes creating platforms for learning, public dialogue, youth engagement, leadership development, and media visibility. When these initiatives are institutionalised, they help translate UPM's expertise into accessible knowledge and meaningful action across multiple stakeholder groups.

At the same time, CEPA plays a critical reputational role. Effective communication and high-quality public engagement elevate UPM's visibility at national, regional, and international levels. Through ambassadors, campaigns, festivals, youth programmes, and digital storytelling, UPM becomes more widely recognised as a thought leader that not only generates sustainability knowledge but also inspires and mobilises action.

Most importantly, this KII highlights behavioural transformation as a long-term institutional outcome. Awareness alone is insufficient unless it influences attitudes, practices, and decision-making. Therefore, the true significance of K3 lies in creating a sustainability culture that is lived and demonstrated across campus and community settings. In this sense, the KII captures how CEPA contributes directly to UPM's long-term legitimacy, public trust, and leadership in planetary health and sustainability.

The indicators outlined for Strategic Outcome 4 (SO4) reflect the intended level of institutional maturity, legitimacy, and regional authority that UPM seeks to achieve in planetary health and sustainability. These indicators are not merely measures of activity, but signals of structural influence, governance integration, and recognised leadership.

Depth and effectiveness of formal partnerships with ministries and public agencies in advancing planetary health and sustainability agendas.

First, the depth and effectiveness of formal partnerships with ministries and public agencies serve as a primary indicator of institutional credibility. This extends beyond the existence of

signed agreements to the quality, continuity, and measurable impact of collaborative engagement. Effective partnerships are characterised by co-developed initiatives, joint policy advisory contributions, technical working group participation, and shared implementation responsibilities. The maturity of these partnerships is reflected in sustained collaboration, policy alignment, and demonstrable contributions to advancing planetary health and sustainability agendas at national and regional levels.

A multi-institutional collaborative network that supports shared leadership, coordinated action, and long-term knowledge exchange on planetary health.

Second, the establishment of a multi-institutional collaborative network signals UPM's capacity to convene and coordinate long-term cooperation across institutions. Such a network must demonstrate shared leadership structures, clearly defined governance mechanisms, and sustained knowledge exchange platforms. Its effectiveness is evidenced through coordinated programming, joint research outputs, cross-border capacity building, and reciprocal expertise sharing. A durable ecosystem of collaboration indicates that UPM has progressed from bilateral engagement to structured regional stewardship.

Demonstrated leadership roles undertaken by UPM in national and regional sustainability governance platforms, working groups, or policy forums.

Third, demonstrated leadership roles undertaken by UPM within national and regional sustainability governance platforms represent a critical marker of institutional authority. This includes formal appointments to advisory councils, technical committees, policy task forces, and regional working groups. Consistent and substantive participation in these platforms affirms UPM's recognition as a governance contributor rather than a peripheral stakeholder.

Recognition of UPM as a trusted reference institution in sustainability-related policy documents, strategies, or national and regional frameworks.

Finally, formal recognition of UPM as a trusted reference institution constitutes the highest level of impact under SO4. This recognition is reflected in citations, acknowledgements, or incorporation of UPM's expertise within policy documents, sustainability strategies, national frameworks, and regional roadmaps. When UPM's research, policy briefs, and technical guidance are referenced in authoritative documents, it signals that the University's influence has become embedded within the architecture of sustainability governance. Collectively, these indicators define the transition of UPM from active participant to recognised regional authority in planetary health and sustainability.

These indicators represent the intended maturity and authority outcomes of SO4:

- a. **Depth and effectiveness of formal partnerships** with ministries and public agencies in advancing planetary health and sustainability agendas.
- b. **A multi-institutional collaborative network** that supports shared leadership, coordinated action, and long-term knowledge exchange on planetary health.
- c. **Demonstrated leadership roles** undertaken by UPM in national and regional sustainability governance platforms, working groups, or policy forums.
- d. **Recognition of UPM as a trusted reference institution** in sustainability-related policy documents, strategies, or national and regional frameworks.



Key Action Plan

Action Plan 1 Institutionalising the ONE-Planet Multi-Institutional Collaborative Network (Quintuple Helix)

API focuses on establishing a coordinated, shared-leadership ecosystem that enables sustained knowledge exchange and collective action in planetary health and sustainability. Grounded in the Quintuple Helix framework—integrating academia, government, industry, civil society, and the environment—this action plan seeks to institutionalise collaboration beyond informal or project-based arrangements. The objective is to create a structured, multi-institutional network anchored in clear governance mechanisms and long-term strategic alignment.

Central to this institutionalisation is the establishment of a formal governance structure comprising a steering committee, thematic clusters aligned with priority sustainability domains, and a shared secretariat responsible for coordination and continuity. Structured joint programming mechanisms will be developed to ensure regular engagement, agenda-setting, and accountability. Knowledge circulation routines, including periodic forums, technical roundtables, and cross-institutional exchanges, will strengthen collaborative coherence. Additionally, cross-institutional communities of practice will be cultivated to facilitate peer learning, co-creation of solutions, and sustained thematic dialogue. Tangible outputs of API include a formal consortium charter, jointly endorsed strategic agendas, position papers, policy dialogues, recurring convenings, and structured working groups—collectively reinforcing UPM's role as a regional convenor and collaborative anchor.

Action Plan 2 Strengthening High-Impact Strategic Government Partnerships

AP2 seeks to deepen and transform UPM's engagement with ministries and public agencies into mission-driven, outcome-oriented partnerships that transcend conventional Memoranda of Understanding. The emphasis is placed on embedding UPM's expertise within governance processes and policy implementation frameworks. Rather than limiting collaboration to consultation or to isolated projects, AP2 promotes sustained co-implementation pathways and structured policy-collaboration mechanisms aligned with national sustainability priorities.

This includes integrating UPM experts into ministry-led programmes through technical advisory roles, secondments, or embedded expertise arrangements. Joint research-to-policy translation platforms will be established to ensure that academic findings are systematically transformed into actionable policy guidance. Collaborative frameworks will enable the co-development of strategic roadmaps, operational guidelines, and implementation models in areas such as planetary health, food security, climate resilience, and sustainable development governance. Tangible outputs under AP2 include co-developed policy documents, formal advisory appointments, joint policy laboratories, and shared implementation platforms. Through these mechanisms, UPM strengthens its institutional credibility and influence within public sector governance ecosystems.

Action Plan 3 Positioning UPM as a Sustainability Governance Leader

AP3 is designed to elevate UPM's institutional leadership within national and regional sustainability platforms. The focus is on transitioning from participant-level engagement to agenda-setting authority within governance forums. This involves strategically securing chair, co-chair, or convenor roles in national committees, ASEAN platforms, and other regional policy networks related to sustainability, planetary health, and One Health governance.

Beyond representation, AP3 emphasises substantive intellectual leadership. UPM will lead thematic dialogues on critical sustainability priorities such as food systems resilience, climate adaptation, integrated health governance, and sustainable development transitions. Authoritative policy briefs, thought leadership papers, and strategic position documents will be produced and disseminated to decision-makers. These outputs are intended to shape policy deliberation and be formally referenced in governance frameworks and national strategies. Tangible outcomes include recognised leadership appointments, published policy briefs, formal citations within strategic documents, and explicit acknowledgment of UPM as a reference institution. Through AP3, UPM consolidates its stature as a trusted authority and influential actor in sustainability governance across the region.

Action Plan 4 Establish the UPM ONE-Planet Digital Gateway (Integrated DataHub Ecosystem)

The UPM ONE-Planet Digital Gateway will establish an integrated digital ecosystem that consolidates strategic regional networks, sustainability datasets, and knowledge resources into a unified institutional platform. The ecosystem will enhance evidence-based decision-making, strengthen regional collaboration, and position UPM as a trusted knowledge gateway for Planetary Health and Sustainability across ASEAN and beyond.

The platform will integrate flagship regional initiatives, including AUN-AFS, MyAgeing Index, SEA One Health, NET-PEAT FDR, and Youth Sustainability Indices, through interoperable data architecture and harmonised governance standards. By connecting research outputs, sustainability indicators, policy intelligence, and institutional performance data, the Digital Gateway will facilitate cross-sector collaboration, policy development, and international partnerships while supporting transparent reporting and institutional accountability.

As a regional knowledge infrastructure, the ONE-Planet Digital Gateway will enable real-time monitoring, digital collaboration, predictive analytics, and open-access knowledge sharing, reinforcing UPM's role as a referral point, regional convener, and strategic leader in advancing planetary health and sustainability. This aligns directly with the Blueprint's aspiration for the Gateway to become a regional knowledge architecture that strengthens international cooperation, transparency, interoperability, and evidence-informed action.

Action Plan 5 Operationalise the Digital Collaboration & Global Engagement Hub. Establish the UPM ONE-Planet Digital Gateway (Integrated DataHub Ecosystem)

The Digital Collaboration & Global Engagement Hub will serve as UPM's regional platform for advancing digital innovation, interdisciplinary collaboration, and international engagement in Planetary Health and Sustainability. Anchored within the UPM ONE-Planet Digital Gateway, the Hub will connect researchers, policymakers, industry partners, and international organisations through integrated digital collaboration spaces that facilitate knowledge exchange, joint research, and evidence-informed solutions to regional and global sustainability challenges.

The Hub will operationalise the Global Planetary Health Digital Twin Network as a collaborative modelling and simulation platform while institutionalising the International Planetary Health Knowledge & Innovation Commons as a structured ecosystem for co-creating research, innovation, and policy solutions. By supporting digital research clusters, shared analytical platforms, virtual laboratories, and international communities of practice, the Hub will strengthen cross-border partnerships, accelerate interdisciplinary collaboration, and position UPM as a regional leader in digital knowledge exchange and collaborative sustainability governance. This initiative reinforces UPM's role as a trusted gateway for regional cooperation, innovation, and evidence-based policy development in Planetary Health and Sustainability.



Action Plan 6 Institutionalise the UPM Planetary Health CEPA and Ambassador Network

The UPM Planetary Health CEPA and Ambassador Network will establish a coordinated institutional platform that enhances UPM's visibility, thought leadership, and public engagement in advancing Planetary Health and Sustainability across national, regional, and global landscapes. Anchored within the principles of Communication, Education and Public Awareness (CEPA), the initiative will strengthen UPM's role as a trusted source of scientific knowledge by mobilising academic experts, industry leaders, youth representatives, students, alumni, and strategic partners as Planetary Health Ambassadors. These ambassadors will actively represent UPM through policy dialogues, expert advisory panels, keynote addresses, professional forums, media engagement, and regional sustainability networks, contributing to evidence-informed decision-making and public discourse.

Complementing this ambassadorial network, a coordinated digital communication framework will integrate thematic storytelling, policy briefs, podcasts, newsletters, social media, mainstream media, and other digital communication platforms to communicate research excellence, partnership outcomes, and institutional achievements. Supported by analytics-driven communication strategies, the initiative will continuously strengthen outreach effectiveness, stakeholder engagement, and public awareness by translating scientific evidence into accessible knowledge for diverse audiences. Collectively, this integrated CEPA ecosystem will amplify UPM's institutional voice, strengthen stakeholder confidence, expand regional and international partnerships, and reinforce the University's position as a recognised regional reference institution and thought leader in Planetary Health and Sustainability.

Action Plan 7 Establish the UPM Planetary Health Leadership and Engagement Ecosystem

The UPM Planetary Health Leadership and Engagement Ecosystem will strengthen UPM's regional leadership by integrating student empowerment, experiential learning, strategic partnerships, institutional recognition, and flagship sustainability engagement into a coherent and collaborative ecosystem. The initiative will institutionalise structured opportunities through summer schools, global internships, youth leadership academies, innovation challenges, sustainability problem-solving laboratories, and cross-border service-learning programmes that nurture globally competent graduates equipped with leadership, systems thinking, and global citizenship competencies. At the institutional level, the ecosystem will establish high-impact engagement platforms, including Planetary Health Week, innovation showcases, policy roundtables, exhibitions, youth forums, and multi-stakeholder dialogues that convene government agencies, industry, civil society organisations, international partners, and academic institutions to foster collaboration, knowledge exchange, and collaborative action.

These engagement platforms will showcase UPM's research excellence and sustainability innovations while strengthening regional and international collaboration networks. In parallel, UPM will systematically pursue international sustainability awards, certifications, benchmarking exercises, and global recognition programmes aligned with the ONE-Planet agenda, supported by evidence-based reporting mechanisms and internationally aligned sustainability frameworks. Together, these initiatives will enhance institutional excellence, strengthen organisational credibility, increase regional and global visibility, and reinforce UPM's standing as a recognised regional convenor, trusted collaborator, and leading institution in advancing Planetary Health and Sustainability.



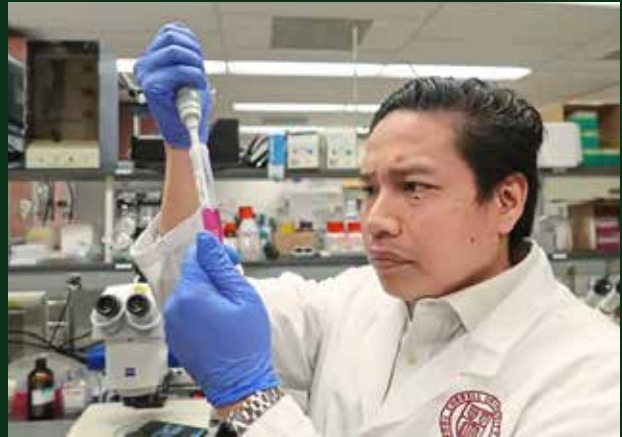
The NET-PEAT (Networked ASEAN Peatland Forest Communities for Transboundary Haze Alert) initiative illustrates Universiti Putra Malaysia's leadership in advancing planetary health and sustainability through research driven innovation and regional collaboration. Recognising the growing threat of peatland degradation, forest fires, and transboundary haze in Southeast Asia, UPM led the development of a technology-based monitoring system that integrates Internet of Things sensors, environmental data networks, and analytics to enable real time monitoring of peatland conditions and early detection of fire risks. The project, led by Prof. Ir. Dr. Aduwati Sali and supported by the APT International Collaborative Fund of the Government of Japan, involved cross border collaboration with partners from Malaysia, Indonesia, and Brunei Darussalam. Through pilot deployments, training programmes, and knowledge exchange activities, the initiative strengthened regional capacity for peatland management



and environmental monitoring. NET-PEAT demonstrates how UPM's interdisciplinary research, technological innovation, and regional partnerships contribute to evidence informed environmental governance, positioning the University as a credible regional reference point in planetary health and sustainability.



The conservation of the Malayan tiger represents a significant example of Universiti Putra Malaysia's leadership in advancing planetary health through science based conservation and global collaboration. Led by Dr. Wan Nor Fitri Wan Jaafar, the initiative focuses on wildlife reproductive biotechnology and conservation genomics to support the recovery of one of the world's most critically endangered species. Through the application of advanced stem cell and cloning technologies, the research seeks to strengthen genetic conservation strategies and enhance long term biodiversity resilience. The work was further strengthened through the 2021 Merdeka Award Grant for International Attachment, which enabled collaboration with the Smithsonian Institution and facilitated international knowledge exchange. By



integrating cutting edge research, talent development, and global partnerships, the initiative demonstrates how UPM contributes to addressing biodiversity loss while positioning itself as a regional knowledge hub for planetary health, conservation science, and sustainable environmental stewardship.

Suggested Roadmap

Key Initiative	Intended Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Consolidation 2032 to 2035
K1. Strategic Networking with Stakeholders	UPM is embedded within policy and implementation ecosystems through structured partnerships, advisory roles, and governance leadership that enable coordinated action on planetary health and sustainability priorities.	1. Institutionalising the ONE-Planet Multi-Institutional Collaborative Network (Quintuple Helix) 2. Strengthening High-Impact Strategic Government Partnerships 3. Positioning UPM as a Sustainability Governance Leader	Establish the ONE-Planet Consortium governance structure and initiate partnerships with key institutions; formalise structured collaborations with ministries and public agencies; embed UPM experts in national sustainability programmes; secure initial chair, co-chair, or convenor roles in policy forums and taskforces related to food security, climate resilience, and One Health.	Expand the ONE-Planet network across ASEAN partners; lead cross-border communities of practice and co-develop regional sustainability guidelines; establish joint policy laboratories and co-implementation platforms with ministries and regional partners; lead ASEAN sustainability working groups and publish regional policy briefs and strategic frameworks.	Institutionalise the consortium as a mature governance ecosystem; embed long-term advisory roles and UPM expertise within national and regional sustainability frameworks; consolidate UPM's standing as a trusted reference institution influencing sustainability governance across the region.
K2. Global Partnership through UPM Planetary Health and Sustainability Gateway	UPM functions as a regional and global knowledge gateway that strengthens collaboration, performance tracking, data-informed decision-making, and influence on planetary health and sustainability agendas.	1. Establish the UPM ONE-Planet Digital Gateway (Integrated DataHub Ecosystem) 2. Operationalise the Digital Collaboration & Global Engagement Hub. Establish the UPM ONE-Planet Digital Gateway (Integrated DataHub Ecosystem)	Launch the UPM DataHub integrating key regional networks, dashboards, and sustainability performance monitoring tools; initiate the Global Planetary Health Digital Twin pilot; establish an international knowledge and innovation commons that connects research, policy, and partnership resources.	Expand the digital collaboration ecosystem; integrate cross-border datasets for research and policy modelling; strengthen digital research clusters and cross-institutional modelling platforms with global partners; enhance the Gateway's role as a shared regional collaboration infrastructure.	Position UPM as an ASEAN Digital Reference Centre for planetary health analytics and data-driven decision support; institutionalise predictive modelling systems that can support governments and regional institutions in planning, sustainability governance, and early warning functions.



Suggested Roadmap

Key Initiative	Intended Outcome	Key Action Plan	Phase 1: Foundation 2026 to 2028	Phase 2: Expansion 2029 to 2031	Phase 3: Consolidation 2032 to 2035
K3. Strengthening Communication, Education and Public Awareness	UPM achieves stronger societal impact, global visibility, and thought leadership through institutionalised communication, education, public awareness, youth engagement, and high-impact sustainability platforms.	1. Institutionalise the UPM Planetary Health CEPA and Ambassador Network. 2. Establish the UPM Planetary Health Leadership and Engagement Ecosystem	Appoint academic, industry, and youth ambassadors; launch coordinated CEPA campaigns through social media, podcasts, newsletters, and media platforms; initiate summer schools, internships, and youth leadership programmes focused on planetary health; launch Planetary Health Week and host national sustainability forums; submit institutional sustainability initiatives for national and international recognition.	Expand the regional ambassador network and strengthen visibility across ASEAN sustainability platforms; scale digital engagement across ASEAN audiences; broaden cross-border experiential learning and regional student innovation platforms; expand sustainability events into regional ASEAN forums; secure regional recognition and improve benchmarking performance.	Establish UPM ambassadors as globally recognised thought leaders in planetary health advocacy; position UPM as a strong digital voice in sustainability communication; anchor a global youth leadership network through UPM graduates; host global planetary health forums and innovation festivals; achieve global recognition and certification for planetary health leadership.



CHAPTER 5

MONITORING, EVALUATION AND ADAPTIVE LEARNING



Monitoring, Evaluation and Adaptive Learning

A dynamic learning system that ensures the Blueprint remains measurable, accountable and responsive to change.



The successful implementation of the Blueprint requires a structured mechanism to ensure that strategies translate into measurable outcomes and long-term institutional transformation. Monitoring, evaluation, and adaptive learning serve as the institutional backbone that enables UPM to track progress, assess effectiveness, and continuously refine its approach to planetary health and sustainability. Given the complex and evolving nature of environmental, social, and economic challenges, a static implementation model would be insufficient. Instead, the Blueprint adopts a dynamic monitoring and learning framework that enables the university to respond to emerging risks, opportunities, and global developments.



Monitoring provides systematic tracking of the implementation of strategic initiatives, ensuring that key actions remain aligned with the intended outcomes of the Blueprint. Evaluation enables the university to assess whether these initiatives are producing meaningful impacts across education, research, campus operations, and societal engagement. To strengthen implementation accountability, the Blueprint should establish a dedicated subsection that clearly connects relevant laws, institutional initiatives, performance indicators, and reporting mechanisms, ensuring that implementation is structured, traceable, and auditable. Adaptive learning then transforms insights from monitoring and evaluation into institutional knowledge that informs future decisions, policy adjustments, and strategic refinements.

This integrated approach is particularly important for planetary health initiatives, which involve interconnected systems spanning environmental sustainability, human wellbeing, economic resilience, and technological innovation. Through a structured monitoring and evaluation framework, UPM will be able to identify progress, highlight areas requiring improvement, and ensure that planetary health principles are embedded across institutional practices. More importantly, this approach strengthens accountability, enhances transparency, and ensures that the Blueprint remains a living framework capable of evolving alongside emerging sustainability challenges.

By institutionalising monitoring, evaluation, and adaptive learning, UPM aims to move beyond isolated sustainability initiatives toward a coordinated and evidence informed approach that enables continuous improvement and long-term institutional impact. The Blueprint provides the general direction and strategic focus for planetary health and sustainability, supported by recommended key indicators to guide progress towards the intended outcomes. A detailed action plan is therefore essential to track implementation, assess outcome attainment, and ensure that institutional efforts remain applied, responsive, and adaptable to changing conditions.

Coordination and Monitoring

Effective implementation of the Blueprint requires a coordinated institutional structure that enables consistent monitoring across faculties, research institutes, administrative units, and campus operations. Coordination ensures that planetary health initiatives are not implemented in isolation but operate as part of an integrated institutional system aligned with UPM's strategic priorities.

To support this process, a designated institutional coordinating body will be established to oversee the monitoring of the Blueprint across the university. This body will facilitate coordination among faculties, research institutes, and administrative units, ensure systematic reporting of progress, and consolidate implementation data to support institutional decision making and strategic oversight. Through this structure, monitoring activities can be conducted in a consistent and integrated manner, enabling the university to track progress across education, research, campus operations, and community engagement initiatives related to planetary health and sustainability.

Monitoring activities will focus on tracking key initiatives, action plans, and indicators identified in the Blueprint. Data collection will draw from multiple institutional sources including academic programmes, research outputs, campus operational systems, community engagement initiatives, and industry partnerships. Where possible, existing institutional reporting mechanisms will be utilised to minimise duplication and ensure consistency across reporting platforms.

To support effective monitoring, the university will progressively strengthen its sustainability data management system to enable systematic collection, consolidation, and analysis of relevant indicators. This will facilitate improved reporting for internal strategic planning as well as external benchmarking exercises such as sustainability rankings, ESG reporting frameworks, and national sustainability initiatives.



Regular reporting cycles will be established to review implementation progress and identify areas requiring attention. These reviews will involve both operational and strategic discussions to ensure that implementation challenges are addressed in a timely manner. The monitoring process will also support institutional transparency by enabling the dissemination of progress updates, case studies, and best practices across the university community.

Through coordinated monitoring, UPM will ensure that planetary health initiatives are systematically tracked, institutional efforts are aligned, and strategic priorities are translated into measurable outcomes.

Evaluation and Adaptive Learning

Evaluation plays a critical role in determining whether the initiatives outlined in the Blueprint are delivering the intended outcomes and contributing to long term institutional transformation. Periodic evaluations will assess the effectiveness, relevance, and impact of programmes implemented under the planetary health and sustainability agenda. These evaluations will consider both quantitative indicators and qualitative insights derived from stakeholder engagement, institutional feedback, and case studies of implementation.



To ensure systematic oversight, a designated institutional body will be established to oversee the evaluation and adaptive learning process of the Planetary Health and Sustainability Blueprint. This body will be responsible for coordinating periodic reviews, consolidating findings from monitoring activities, and ensuring that evaluation results inform strategic decision making across the university. Through this mechanism, evaluation processes will remain consistent, transparent, and aligned with the broader governance framework of the Blueprint.

Beyond performance assessment, evaluation serves as a mechanism for institutional learning. Findings from evaluations will inform strategic adjustments, enabling UPM to refine its policies, programmes, and operational approaches. This process of adaptive learning allows the university to respond to emerging challenges, incorporate new scientific knowledge, and adopt innovative practices that strengthen sustainability outcomes.

Learning will also be supported through knowledge sharing platforms, internal dialogues, and collaborative engagements across faculties and research centres. By institutionalising adaptive learning, UPM ensures that the Blueprint remains responsive, relevant, and capable of evolving alongside changing planetary health priorities.

Risks and Controls

The implementation of the Blueprint may face several institutional, operational, and external risks that could affect progress if not effectively managed. Institutional risks include

1. Fragmented governance structures
2. Inconsistent reporting systems,
3. Limited coordination across faculties and administrative units.

Operational risks may arise from resource constraints, competing institutional priorities, and capacity limitations in implementing sustainability initiatives. In addition, external factors associated

with an increasingly VUCA (Volatile, Uncertain, Complex, and Ambiguous) environment, including regulatory changes, funding uncertainties, and evolving sustainability standards, may also influence the implementation landscape.

To mitigate these risks, the Blueprint emphasises the establishment of clear governance structures, defined roles and responsibilities, and strengthened coordination mechanisms across the university. Within the UPM governance framework, oversight and coordination will be anchored through the Vice Chancellor's Office and relevant Deputy Vice Chancellors, with operational coordination undertaken by a designated institutional body responsible for the Blueprint implementation. This structure ensures alignment between university leadership, faculties, research institutes, and administrative units in advancing the planetary health agenda. Improved data management systems will support more reliable monitoring and reporting of sustainability initiatives across PTJs. In addition, capacity building programmes will enhance staff and researcher capabilities in implementing planetary health approaches within teaching, research, and campus operations, thereby strengthening institutional readiness and accountability.

Regular monitoring and periodic evaluations will further function as risk management tools by enabling early identification of implementation gaps and corrective actions. Engagement with stakeholders including government agencies, industry partners, and community organisations will also help diversify resources and strengthen collaborative support for sustainability initiatives.

Through these mitigation measures, UPM aims to reduce implementation risks while ensuring that the Blueprint remain resilient, adaptive, and capable of delivering long term institutional and societal impact.



Conclusion and Way Forward

The Blueprint represents a strategic commitment to reposition the university as a leading institution that integrates environmental stewardship, human well-being, and sustainable development within its core mission of education, research, innovation, and societal engagement. At a time when global challenges such as climate change, biodiversity loss, food insecurity, and public health risks are increasingly interconnected, universities have a critical responsibility to contribute knowledge, leadership, and solutions that support planetary resilience. This Blueprint reflects UPM's recognition of that responsibility and its readiness to translate its longstanding strengths in agriculture, environmental sciences, health, and community engagement into a comprehensive institutional response to planetary health challenges.

The Blueprint builds upon UPM's existing institutional advantages, including its multidisciplinary academic ecosystem, strong research institutes, extensive green campuses, and long history of contributions to agriculture, biodiversity conservation, and food systems. These strengths provide a unique platform for the university to operationalise planetary health principles in a manner that integrates scientific knowledge, practical solutions, and community engagement. By aligning education, research, campus operations, and partnerships within a coherent strategic framework, the Blueprint seeks to transform sustainability from isolated initiatives into an integrated institutional ethos that guides decision making and daily practices across the university.

Central to this transformation is the recognition that planetary health cannot be addressed through disciplinary silos. Complex sustainability challenges require transdisciplinary collaboration, systems thinking, and active engagement with stakeholders beyond the university. The Blueprint therefore emphasises the integration of planetary health principles across academic programmes, the strengthening of transdisciplinary research, and the expansion of collaborative partnerships with industry, government, and communities.

Through these efforts, UPM aims to cultivate future ready graduates who are equipped not only with technical knowledge but also with the ethical awareness and leadership capacity necessary to navigate complex sustainability challenges.

The Blueprint also highlights the importance of institutional governance, monitoring, and adaptive learning in ensuring that the planetary health agenda translates into measurable impact. Effective coordination, robust data systems, and continuous evaluation mechanisms will enable the university to track progress, identify gaps, and refine strategies over time. In an increasingly volatile, uncertain, complex, and ambiguous environment, the ability to adapt and learn from implementation experiences will be essential to sustaining momentum and ensuring that initiatives remain relevant and impactful.

Looking ahead, the successful realisation of this Blueprint will depend on sustained commitment across all levels of the university community. Top management, Board of Directors, faculties, research institutes, administrative units, students, and external partners each have a role to play in embedding planetary health principles within their respective spheres of influence. Institutional leadership will be critical in providing direction, coordination, and support for implementation efforts, while fostering a culture that recognises sustainability as a shared responsibility rather than an additional task.

The way forward for UPM involves strengthening the integration between knowledge generation and real-world application. The university's campuses and research platforms provide an opportunity to serve as demonstration environments where innovative solutions for sustainable food systems, biodiversity conservation, low carbon development, and healthy communities can be tested and refined. By leveraging these living environments as platforms for experimentation and learning, UPM can generate practical models that inform policy, guide industry practices, and support community resilience.

Equally important is the expansion of partnerships that enable the university to amplify its impact beyond the campus. Engagement with industry, government agencies, civil society organisations, and international networks will facilitate knowledge exchange, collaborative innovation, and resource mobilisation. Through such partnerships, UPM can contribute to national and regional efforts to advance sustainable development while strengthening its position as a respected and referred institution in matters related to planetary health.

Ultimately, the Blueprint is intended to serve not merely as a policy document, but as a guiding framework that shapes the university's long-term trajectory. Its success will be measured not only through institutional indicators but also through the university's ability to contribute meaningful solutions to the environmental and societal challenges facing Malaysia and the broader global community.

As UPM moves forward, the Blueprint provides a foundation for continuous institutional evolution and reform. Through strong governance, coordinated implementation, and a culture of learning and collaboration, the university can harness its intellectual capital, infrastructure, and partnerships to advance planetary health and sustainability. In doing so, UPM positions itself not only as a centre of academic excellence, but also as a catalyst for transformative change that supports the well-being of people, ecosystems, and future generations.



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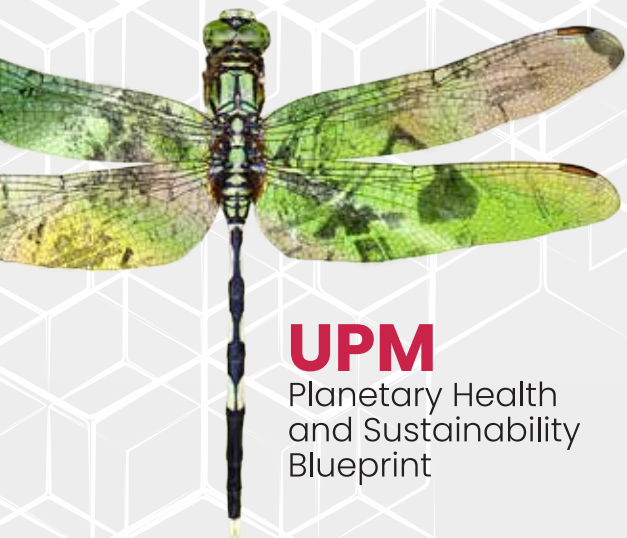
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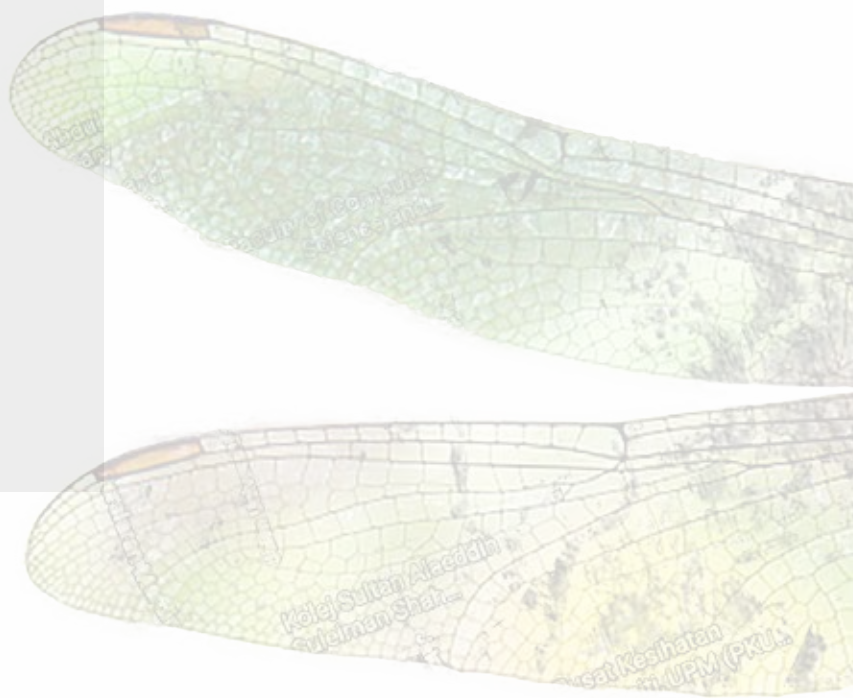
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