

TURN THE TIDE

NEWSLETTER

Green Psyche Environmental Association,
Faculty of Livestock, Fisheries & Nutrition
Wayamba University of Sri Lanka



Biodiversity	2
Climate Change	3
Food and Nutrition security	4
Green Entrepreneurship	6
Eco-Insights	8
Calling all authors	14
In to the club	15

WHY? A NEWSLETTER.

From the Senior Treasurer's Pen,

It is with profound pleasure and a deep sense of pride that we present the fifth issue of Turn the Tide, the official bimonthly newsletter of the Green Psyche Environment Association, Faculty of Livestock, Fisheries, and Nutrition, Wayamba University of Sri Lanka.

This publication is conceived as an intellectual platform to enhance environmental literacy and awareness among youth, focusing on the most critical sustainability challenges of our era. Grounded in four thematic pillars– Biodiversity, Climate Change, Food and Nutrition, and Green Entrepreneurship– Turn the Tide endeavours to promote scholarly discourse, stimulate critical reflection, and encourage informed and responsible action.

Through contributions from academics, professionals, and emerging scholars, this issue seeks to disseminate innovative perspectives, research insights, and evidence-based solutions that empower young people to become proactive contributors to environmental stewardship and sustainable development.

As we mark the publication of this fifth issue, I am encouraged by the increasing engagement and interdisciplinary collaboration among students across faculties and universities. The formation of such a cohesive and environmentally conscious academic community is indispensable in addressing the complex and interrelated environmental challenges confronting our society. This shared commitment and collective vision continue to be the cornerstone of this initiative. I trust that Turn the Tide will continue to cultivate a spirit of inquiry, responsibility, and leadership among its readership, inspiring future generations to pursue knowledge-driven, ethical, and sustainable solutions to global environmental issues.

I extend my sincere appreciation to all contributors, editorial members, and readers for their continued support and commitment to this cause. Together, let us continue to turn the tide toward a more resilient and sustainable future.

CONTACT

☎ 0719355774 / 0718118694
✉ greenpsyche@gmail.com



Dr. T. Ursula S. Peiris
Department of Nutrition & Dietetics
Faculty of Livestock, Fisheries & Nutrition
Wayamba University of Sri Lanka

FUNGI: A NATURAL SOLUTION TO THE PLASTIC POLLUTION PROBLEM

The world's plastic production is rising at an alarming rate. In 2024, global plastic production reached 460 million metric tons, and it is expected to hit 500 million metric tons in 2025. If this trend continues, it could reach 736 million metric tons by 2040 – and even 884 million metric tons under business-as-usual conditions.

The major concern is that plastic takes more than 400 years to decompose. Most plastics are non-biodegradable, and even when they do break down, they turn into microplastics – tiny particles that contaminate soil, oceans, and even our bodies. Recent studies have detected microplastics in human blood, raising serious concerns about long-term health effects.

Fungi: Nature's Secret Plastic Recyclers

Scientists have discovered that marine fungi can naturally degrade certain types of plastics. According to Professor Anthony Amend from the Pacific Bio sciences Research Center, fungi possess unique enzymes capable of breaking down materials that most other organisms cannot.

In groundbreaking studies, nearly 60% of marine fungi tested were found to be capable of degrading plastics.

Some species stand out for their remarkable abilities:

- *Parengyodontium album* can break down polyethylene (a common plastic) and convert it into carbon dioxide.
- *Aspergillus spp.* in seawater shows strong potential to degrade various plastics.
- *Penicillium spp.* not only break down plastics but also use them as nutrients, converting harmful waste into energy for growth.

How Fungi Break Down Plastic

The process begins when ultraviolet (UV) rays of sunlight weaken and fragment large plastic pieces into smaller bits, known as microplastics. Marine fungi then colonize these particles and release extracellular enzymes that break down complex plastic polymers into simpler molecules.

These smaller compounds serve as a carbon source for fungal growth. During this process, fungi release carbon dioxide through respiration – a natural part of the bio-degradation cycle that works alongside photodegradation to gradually reduce plastic concentration in oceans.

A Ray of Hope for Our Oceans

Plastic-degrading fungi offer a promising natural solution to marine pollution. By breaking down plastics, they help:

- Reduce toxic effects on marine life.
- Prevent entanglement and ingestion by fish, turtles, and seabirds.
- Support the recovery of marine ecosystems.

While fungi alone cannot solve the global plastic crisis, their ability to act as nature's recyclers highlights how the environment itself holds keys to its restoration.

Looking Ahead

Reducing plastic use and improving waste management are still crucial. Yet, plastic-eating fungi show how nature and science can work together to protect our oceans. Harnessing their potential, alongside human innovation, could bring lasting relief to sea life and global biodiversity.

References:

- <https://www.frontiersin.org/journals/marinescience/articles/10.3389/fmars.2021.738877/full>.



Buddhini Rathnayaka

22/23 Batch

Faculty of Livestock, Fisheries and Nutrition
Wayamba University of Sri Lanka

CLIMATE CHANGE

A LETTER OF LOVE & GRATITUDE TO THE OCEAN

The Ocean in Our Hearts

For us Sri Lankans, the ocean isn't just water. It's woven into our identity – from childhood memories of running barefoot on the sand and splashing in the waves, to family fishing trips and evenings spent watching sunsets. The sea has shaped our culture, our economy, and our spirit.

The Power and Memory of the Sea

The ocean gives, but it also reminds us of its might. The 2004 tsunami stands as a solemn reminder. In just minutes, it changed lives forever – taking homes, families, and dreams. That day, we witnessed both the ocean's breathtaking beauty and its immense power.

Oceans Under Threat Today

Our ocean faces multiple, human-driven threats.

Plastic Pollution: Over 8 million metric tons of plastic enter the world's oceans every year – equivalent to dumping a garbage truck full of plastic into the sea every minute. Sri Lanka contributes over 1.5 million tons of plastic waste annually. What seems small – a bag, a bottle, a straw – accumulates into massive harm: Turtles mistake plastic bags for jellyfish. Coral reefs are smothered by debris. Microplastics are now found in over 90% of fish sampled from the Indian Ocean – meaning the pollution has reached our dinner tables.

Climate Change and Ocean Warming: Sea levels are rising at about 3.3 millimeters per year, and ocean temperatures are climbing. Coral bleaching is accelerating, destroying habitats for thousands of marine species. Fish populations are migrating away from traditional fishing zones, directly affecting over 300,000 Sri Lankans who depend on fishing for their livelihoods.

Other Pressures: Overfishing, oil spills, and agricultural runoff add further stress, disrupting delicate marine ecosystems and threatening coastal

resilience.

Voices from the Shore

At the **Value Museum**, together with **Greenspace South Asia**, people shared their ocean stories – real, raw, and deeply personal. A student said something unforgettable: "The sea is like our mother. She always protects us. Now it's our turn to protect her." That simple statement carried profound truth. The ocean gives us life – but it needs us to give back.

Turning Concern into Action

Even small actions can create big waves of change. Refuse single-use plastics: bring reusable bottles and bags. Join or organize clean-ups: one small clean-up can inspire hundreds. Plant mangroves and coastal trees: they prevent erosion, store carbon, and buffer storms. Support sustainable fisheries: buy fish caught responsibly to protect marine biodiversity. Educate and inspire: teach children to love and respect the sea. Remember, one tiny wave may seem small, but millions together form the ocean. Every individual action, multiplied by many, can restore our seas.

Our Shared Future

This wasn't just an event – it was a wake-up call. The ocean is part of who we are: in our memories, our hearts, and our future. Protecting it means protecting our own lives, our communities, and our island home.

Healthy oceans regulate our climate, produce over half of the planet's oxygen, and absorb nearly one-third of global carbon emissions. Protecting them isn't just an act of love – it's essential for planetary survival.



T. P. V. A. H Peiris

22/23 Batch

Faculty of applied science
University of Sri Jayawardenapura

**CHANGING THE CLIMATE STORY:
AWARENESS TO ACTION**

FOOD AND NUTRITION SECURITY

SAFE AND SUSTAINABLE: LOCAL FOOD WITH GLOBAL STANDARDS

The Modern Dilemma: Busy Lives and Forgotten Self-Care

In 2025, technology and artificial intelligence shape almost every aspect of our lives. Yet ironically, people are busier and more stressed than ever. Amid endless deadlines and digital distractions, self-care often takes a back seat. As an undergraduate, even I rarely stop to think about what I eat each day. But this simple question matters deeply: Is our food safe?

Understanding Food Safety

Food safety is the science of ensuring that food is handled, prepared, and stored in ways that prevent illness. When several people get sick after eating the same contaminated food, it's known as a food-borne disease outbreak.

Food safety also includes food defense, which protects consumers from harmful contamination. Scientifically, water-soluble vitamins like the B-complex and vitamin C are easily destroyed during cooking, while food stored between 5°C and 60°C enters the "danger zone" where bacteria grow rapidly. Good hygiene, correct temperatures, and safe storage are essential for protecting both nutrition and health.

The Shift from Tradition to Convenience

Modern life has made fast food and ready-made meals more common, while traditional eating habits are fading. Yet Sri Lanka has a rich culinary heritage built on wholesome ingredients such as greens, lentils, cashew nuts, coconut milk, and turmeric—all known for their anti-inflammatory and immune-boosting effects.

Traditional foods like kathuru murunga, horse gram, tamarind, and fermented milk provide valuable vitamins, proteins, and beneficial bacteria for gut health. Nutrition experts warn, however, that eating too much refined rice and wheat can increase the risk of insulin resistance, type 2 diabetes, and poor lipid profiles.



Indigenous Wisdom Meets Nutrition

Sri Lanka's traditional food culture combines nutrition, healing, and ecological knowledge. Backyard cultivation has always played a vital role in keeping this legacy alive. Local rice varieties—black, red, and brown—are rich in anthocyanins and phytochemicals that may reduce the risk of heart disease and cancer.

Leafy greens such as *Acacia arabica* (Babool), *Aegle marmelos* (Wood apple), and *Aerva lanata* (Polpala) are often brewed into herbal drinks that support immunity and overall wellness.

Biodiversity: A Hidden Treasure of Nutrition

Sri Lanka's biodiversity offers many underused but highly nutritious plants. Fruits like *Benincasa hispida* (Ash gourd), *Psidium guajava* (Guava), and *Artocarpus heterophyllus* (Jackfruit), and vegetables such as garlic, onion, cucumber, and bitter melon, have proven antioxidant and antidiabetic properties.

Rare endemic fruits—*Elaeocarpus serratus* (Ceylon Olive) and *Flacourtia indica*—show antioxidant and starch-digesting enzyme inhibition potential, making them valuable for developing functional foods. Even local tubers and roots contain bioactive compounds with antimicrobial, anti-obesity, and cholesterol lowering effects, confirming much of what traditional healers knew long ago.



Food Safety at Home: Risks and Solutions

Unsafe food containing aflatoxins, nitrosamines, or pesticide residues can cause serious health problems, including cancer. But there's a safer and more sustainable option—home gardens. Backyard crops such as gotukola, mukunuwenna, bitter gourd, sweet potato, wood apple, and jackfruit provide vitamins, antioxidants, and natural therapeutic compounds without harmful chemicals. They strengthen immunity, promote household food security, reduce carbon footprints, and help preserve indigenous biodiversity.

From Backyard Gardens to Global Markets

With value addition, processing innovations, and sustainable packaging, Sri Lanka's traditional foods can reach international markets. This not only creates economic opportunities but also allows us to share our indigenous food knowledge as part of global efforts for health, climate resilience, and sustainability.



Conclusion: Heritage, Healing, and Hope

The food grown in our own backyards can meet global standards of safety and sustainability. These foods are nutritious, therapeutic, and deeply connected to our heritage and biodiversity.

By valuing and promoting them, Sri Lanka can contribute to a healthier and more sustainable global food system.

"From backyard gardens to global tables, Sri Lanka's indigenous food wisdom is not just nourishment—it's heritage, healing, and hope for a sustainable future."

References:

- Gulf News. (2019, February 3). Why Sri Lankan food is one of the healthiest ways of eating. <https://gulfnews.com/world/asia/why-sri-lankan-food-is-one-of-the-healthiest-ways-of-eating-1.1549195011610>.
- Mihiranie, S., Jayasinghe, J. K., Jayasinghe, C. V. L., & Wanasundara, J. P. D. (2020). Indigenous and traditional foods of Sri Lanka. *Journal of Ethnic Foods*, 7(1), Article 42. <https://doi.org/10.1186/s42779-020-00075-z>.
- Waisundara, V. Y. (2020). Traditional functional food of Sri Lanka and their health significance. In J. Prakash, V. Y. Waisundara, & V. Prakash (Eds.), *Nutritional and health aspects of food in South Asian countries* (pp. 33-50). Academic Press.



Dulana Kumarasiri

22/23 Batch

Faculty of Livestock, Fisheries and Nutrition
Wayamba University of Sri Lanka



"A safe, affordable and plentiful supply of food is a national security issue"

SUSTAINING TOMORROW: EMPOWERING NUTRITION FOR ALL

TOURISM WITHOUT A TRACE

Redefining tourism through ecological integrity and carbon responsibility.

Tourism is traditionally celebrated for boosting the economy, yet it frequently comes with environmental costs, including carbon emissions, waste, and strain on delicate ecosystems. A new generation of green entrepreneurs is changing this story. Guided by the principle of “leave no trace,” youth-led sustainable tourism ventures—ranging from Eco-lodges and community-focused projects to low-carbon travel solutions—demonstrate that tourism can foster economic growth while protecting the planet.



From Profit to Planet Green entrepreneurship transforms tourism from an extractive industry into a regenerative one.

These emerging Eco-preneurs are reshaping how tourism operates, embedding sustainability into its core. They prioritize renewable energy, local materials, and community engagement, showing that profitability and planetary health can coexist. Their efforts illustrate how a green transition within tourism contributes to national sustainability goals and climate resilience.

Eco-Lodges: Architecture in Harmony with Nature Designing low-impact accommodations that conserve biodiversity and empower communities.

Eco-lodges represent the principle of “tourism without a trace.”

Built with local, renewable materials, powered by clean energy, and designed to blend with natural surroundings, they offer authentic guest experiences while conserving biodiversity.

Sri Lanka’s eco-lodges in Ella, Knuckles, and the Sinharaja rainforest offer sustainable, low-impact stays that blend with nature. They promote eco-friendly practices, and provide immersive experiences like guided nature walks, bird watching, and wellness activities. These lodges support biodiversity conservation and community development while giving travellers an authentic, environmentally responsible experience. Many eco-stays are led by youth, integrating traditional wisdom with modern global practices in sustainable tourism.

Community-Based Tourism: Economics of Empowerment

Local ownership retains income, preserves heritage, and sustains rural resilience.

Community-Based Tourism empowers people and places, keeping the benefits of travel within local communities. Visitors can stay in homestays, participate in traditional farming, or learn local crafts, directly supporting rural livelihoods. This approach helps reduce rural-urban migration and preserves cultural heritage. According to the UN World Tourism Organization (2023), community-based models retain 30-50% more income locally than conventional tourism, enabling communities to act as guardians of tourism, rather than bearing its negative impacts.





Low-Carbon Journeys: Cutting Emissions, Not Experiences

Youth-led innovations drive decarbonization across transport and accommodation.

Low-Carbon Journeys rely on cutting emissions. Tourism accounts for nearly 8% of global greenhouse gas emissions, Much of it from transport and accommodation (Lenzen et al., 2018). To counter this, youth entrepreneurs are pioneering cycling tours, electric vehicle safaris, and zero-waste camping. Along Sri Lanka's southern coast, eco-ventures promote "plastic-free beaches" and integrate solar power, showing how small-scale initiatives can make tourism cleaner and greener. INSEE Eco cycle has removed over 700 kg of plastic from Sri Lanka's beaches through clean-ups under the World Bank-backed PLEASE project, promoting community awareness and the reduce-reuse-recycle approach to combat coastal plastic pollution.

National Action: Aligning Tourism with the SDGs Integrating sustainability into policy ensures equitable and eco-friendly growth.

National initiatives in Sri Lanka aim to promote sustainable tourism and support SDG goals by developing Eco-friendly destinations across nine provinces. balancing environmental protection with local community and economic benefits. These initiatives balance environmental protection with local community and economic benefits, positioning the country as a model for sustainable development in the Asia-Pacific region.

Beyond Minimizing Impact: Building Resilience Sustainable tourism regenerates ecosystems, cultures, and economies simultaneously.

Sustainable tourism goes beyond minimizing impact—it seeks to transform the sector to build resilience.

Eco-lodges protect forests, community-based tourism preserves cultural traditions, and low-carbon initiatives tackle climate change. Together, they embody the concept of "Tourism Without a Trace."



The Way Forward: Investing in Youth for a Green Tourism Future

Supporting young eco-preneurs secures a climate-conscious, inclusive tourism sector.

To unlock this potential, Sri Lanka should support young entrepreneurs with training, green financing, and favourable policies. By investing in these ventures now, the country can ensure that future travellers experience memorable journeys while ecosystems flourish and communities thrive.

References:

- Drivers of global tourism carbon emissions | Nature Communications INSEE Ecocycle continues beach cleanups to reduce national plastic pollution Thelsland(<https://island.lk.insee-ecocycle-continues-beachcleanup-to-reduce-national-plasticpollution/>).
- SLTDA | Sri Lanka Tourism Development Authority(<https://sltda.gov.lk/en/annual-report>).
- Annual-Report-2023-English-compressed.pdf(<https://www.sltda.gov.lk/storage/commonmedia/Annual-Report-2023>).



F Maryam

21/22 Batch

Faculty of Livestock, Fisheries and Nutrition
Wayamba University of Sri Lanka

**NURTURING NATURE'S DIVERSITY
FOR BETTER TOMORROW**

EXPERT VOICES FOR A GREENER TOMORROW

When Flowers Speak: How Plants and Pollinators Keep Biodiversity Alive

A morning full of messages:

On a sunny morning, insect activity is evident. Bees visit flowers in quick succession, butterflies move along the hedgerows, and beetles are observed entering blossoms. To the casual eye, it's a beautiful summer scene. But beneath this colorful display lies a quiet drama of survival, communication, and resilience that is shaping the future of our ecosystems – and it starts with the silent language between plants and their insect partners.

Nature's ancient partnership:

Plants and insects are bound by one of the oldest and most vital partnerships in nature. Flowering plants offer nectar and pollen as rewards, while insect pollinators repay them by transporting pollen between blooms. This mutual exchange fuels biodiversity: without pollinators, wildflowers would fade, food crops would decline, and ecosystems would lose balance.

Yet, not all visitors are welcome. Alongside helpful pollinators come herbivores – caterpillars, locusts, and other pests – capable of causing extensive damage to leaves and flowers.

How plants fight back:

When attacked, plants do not passively endure. The interactions with herbivores, have been shown to induce plant defences, fine tuning resistance and repellence by altering plant's secondary metabolism, suggesting an ecological cost of induced defence by reduced pollination.

Interactions with herbivores can trigger chemical defences, adjusting the plant's secondary metabolism to increase resistance or repel attackers. However, these defences often come with an ecological cost, sometimes reducing pollination efficiency.

Our research on plant-pollinator interactions under biotic stressors has shown that when plants are stressed – by pests – they can adjust their flowers to talk more persuasively to pollinators.

In species that rely heavily on pollinators to reproduce, flowers can change their chemistry under biotic pressure, making themselves more attractive by changing the floral scent composition. It's as if the flowers, sensing trouble, double down on their alliances with bees, butterflies, and beetles.

A strategy for survival:

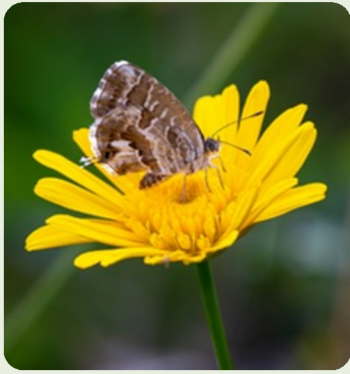
This is no evolutionary coincidence; it's a survival strategy. It's a survival strategy. By reinforcing ties with pollinators, stressed plants can boost their chances of setting seed and passing on their genes. And for pollinators, it means a more rewarding visit at a time when resources might otherwise be scarce. It's a subtle yet powerful example of resilience, co-evolution, and cooperation.

A partnership at risk:

But this mutualistic partnership is under threat. Around the world, pollinator populations are in decline, pressured by pesticides, habitat loss, and climate change.

If pollinators disappear, plants lose not only their reproductive partners but also the ability to deploy these emergency survival tactics. Most flowering plant species depend on insect pollinators for reproduction, and pollination is also of critical concern to produce fruit, vegetable and seed crops for human consumption.

Recent meta-analyses indicate that over 75% of the top world crops are at least moderately dependent on animal pollinators. What good is making your flowers more attractive if there are no bees left to notice?



Keeping the conversation alive: As a society, we need to value the delicate relationship in our gardens, forests, and farmlands.

Pollinators are not optional extras in nature – they are keystones holding up entire ecosystems. Protecting them means more than banning harmful chemicals or planting wildflower strips. It means valuing biodiversity as a living web of relationships, where the health of one species is bound tightly to the survival of another.

A story worth listening to: Next time you see a bee pause on a flower, remember: you are witnessing a conversation that began billions of years ago. It is a story of resilience, adaptation, and hope. And whether it continues depends on the choices we make today.

“The enduring dialogue between plants and pollinators is vital for sustaining biodiversity and food security – a conversation we must protect to preserve the balance of life on Earth.”



Dr. W. W Upuli Wickramaarachchi
Lecturer
Department of Agricultural Biology
Faculty of Agriculture
University of Ruhuna.

Climate Change and Our Oceans: A Quiet Calamity Underneath the Waves

The ocean, covering more than 70% of our planet, is one of Earth's greatest life-support systems. It plays a pivotal role in regulating the Earth's climate system, absorbing approximately 90% of the excess heat generated by anthropogenic greenhouse gas emissions and nearly 30% of atmospheric CO₂ (IPCC, 2021).

Ocean produces oxygen, and sustains millions of species, including countless communities that depend on it for food and livelihood.

But today, climate change is pushing our oceans to a breaking point, with devastating consequences for marine life with wide-ranging impacts on biodiversity, fisheries, and human well-being.

Rising Temperatures

As greenhouse gas emissions trap heat in the atmosphere, the ocean absorbs much of it. Warmer waters disrupt the delicate balance of marine ecosystems. Coral reefs, often called the "rainforests of the sea," are bleaching at alarming rates, losing the vibrant algae they depend on for survival. Many fish species are migrating toward cooler waters, disturbing food chains and threatening traditional fishing communities.

Ocean Acidification

Increased carbon dioxide doesn't just heat the planet, it dissolves into the sea, making oceans more acidic. This change harms shell-forming organisms like clams, oysters, and tiny plankton, which form the foundation of the marine food web. If these species struggle, the ripple effect reaches predators, fisheries, and even human economies.

Cryosphere-Ocean Linkages

Melting of polar ice sheets not only contributes to sea-level rise but also disrupts marine food webs. The decline in Arctic summer sea ice, shrinking by 13% per decade, reduces habitat availability for ice-dependent species such as penguins, seals and polar bears, while altering phytoplankton bloom dynamics critical for primary productivity (Serreze & Stroeve, 2015).



A thriving ecosystem (left) and a bleached reef (right), demonstrating the visible consequences of the industrial footprint.

Meanwhile, warming waters disrupt the migration patterns of whales and turtles, putting additional pressure on already vulnerable species.

Socio-Economic Implications

Marine ecosystem services contribute an estimated US\$2.5 trillion annually to the global economy (Costanza et al., 2014). However, climate-driven declines in fish stocks are projected to reduce maximum sustainable yields by up to 25% in tropical regions by mid-century (FAO, 2020).

These impacts disproportionately affect small-scale fisheries and coastal communities reliant on marine resources.

Why It Matters to Us

Healthy oceans are vital for human survival. They provide food security, jobs, climate regulation, and even medicines. The decline of marine life due to climate change threatens global biodiversity and the balance of life on Earth.

Pathways Forward

While the challenges are immense, solutions are within reach. Reducing carbon emissions, protecting marine habitats, and promoting sustainable fishing practices can help the ocean and the life it sustains recover. Community awareness and individual action, such as reducing plastic use and supporting clean energy, also play a part. Mitigation through rapid decarbonization remains the most effective strategy to reduce ocean stressors. Concurrently, adaptation measures such as expanding marine protected areas, restoring mangroves and seagrasses, and implementing ecosystem-based fisheries management are essential to enhance resilience.

Strengthening ocean observation systems and interdisciplinary research is critical to refine projections and inform policy interventions.

Conclusion

The scientific evidence is unequivocal: climate change is reshaping the physical, chemical, and biological characteristics of the ocean at an accelerating pace. Addressing these challenges requires urgent integration of marine science into climate policy, ensuring that ocean life and the human societies that depend on it can withstand the century ahead.

The ocean is resilient, but it needs our help. By acting now, we can safeguard its wonders for future generations.

References:

- Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S. J., Kubiszewski, I., Turner, R. K. (2014). Changes in the global value of ecosystem services. *Global Environmental Change*, 26, 152-158. <https://doi.org/10.1016/j.gloenvcha.2014.04.002>.
- Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S. J., Kubiszewski, I., Turner, R. K. (2014). Changes in the global value of ecosystem services. *Global Environmental Change*, 26, 152-158. <https://doi.org/10.1016/j.gloenvcha.2014.04.002>.
- FAO. (2020). *The State of World Fisheries and Aquaculture 2020. Sustainability in action*. Rome: Food and Agriculture Organization of the United Nations.
- IPCC. (2021). *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.
- NOAA. (2022). *Global Climate Report 2021*. National Oceanic and Atmospheric Administration. Retrieved from <https://www.ncei.noaa.gov>.
- Serreze, M. C., & Stroeve, J. (2015). Arctic sea ice trends, variability and implications for seasonal forecasting. *Philosophical Transactions of the Royal Society A*, 373(2045), 20140159. <https://doi.org/10.1098/rsta.2014.0159>.



Dr. W.A.A.D. Lanka Wickramasinghe
 Dean / Senior Lecturer
 Department of Aquaculture and Seafood Technology (AST)
 Faculty of Fisheries and Ocean Sciences (FFOS)
 Ocean University of Sri Lanka

Food and Nutrition Security: A Cornerstone for Sustainable Health and Development

Food and nutrition security remains one of the most critical challenges of the 21st century, directly influencing human health, productivity, and social development. While global agriculture produces sufficient food to feed the population, inequalities in access, affordability, and utilization mean that millions still suffer from hunger, micronutrient deficiencies, and diet-related non-communicable diseases (NCDs).

Why Food and Nutrition Security Matters

Food and nutrition security goes beyond ensuring adequate food availability—it encompasses consistent access to safe, diverse, and nutrient-rich foods that support health across the life course.

It requires stability of food supplies, affordability, and cultural acceptability to meet dietary needs. The lack of adequate nutrition weakens immunity, reduces cognitive development in children, increases susceptibility to diseases, and impairs economic productivity.

The Double Burden of Malnutrition

- **Undernutrition:**Millions face chronic hunger, stunting, and wasting, particularly in low- and middle-income countries.
- **Overnutrition:**Rapid urbanization and dietary transitions have led to rising obesity and dietrelated NCDs.
- **Micronutrient deficiencies:** “Hidden hunger” from lack of essential vitamins and minerals continues to affect maternal and child health outcomes.

This double burden demonstrates that food insecurity is not only about insufficient calories but also about poor diet quality.

Drivers of Food and Nutrition Insecurity

- **Climate Change:** Extreme weather events disrupt agricultural production and threaten food availability.
- **Economic Inequalities:** Rising food prices disproportionately affect vulnerable populations, limiting access to nutrient-rich foods.

- **Conflict and Displacement:** Wars and migration disrupt local food systems and weaken social protection.
- **Globalization and Diet Transition:** Increased consumption of ultra-processed foods undermines traditional, nutrient-dense diets.

Pathways to Strengthening Food and Nutrition Security

Promote Sustainable Agriculture

Investments in climate-smart agriculture, crop diversification, and reduced post-harvest losses ensure stable food supplies while protecting ecosystems.

Improve Food Systems and Access

Policies should support local production, strengthen food distribution networks, and subsidize nutrient-rich foods to improve affordability.

Enhance Nutrition Literacy

Education campaigns targeting both urban and rural communities encourage healthier food choices, supporting dietary diversity and reducing NCD risk.

Prioritize Vulnerable Populations

Children, pregnant and lactating mothers, and the elderly require tailored interventions—such as fortified foods, supplementary feeding programs, and school nutrition policies.

Integrate Food and Health Policies

National health systems must treat nutrition security as a public health priority, integrating it into NCD prevention, maternal and child health programs, and community health initiatives.

Conclusion

Food and nutrition security is not merely a development goal—it is a foundation for national health, social equity, and economic growth. Addressing it requires coordinated action across agriculture, health, education, and social protection sectors. Governments, institutions, and communities must recognize that “Ensuring good nutrition today safeguards health tomorrow.”



Dr. Ananda Chandrasekara
Retired Professor
Department of Nutrition & Dietetics
Faculty of Livestock, Fisheries & Nutrition
Wayamba University of Sri Lanka

The Genius of Nature: How Biomimicry is Weaving a Sustainable Future for Fashion

From emulating ecosystems to mimicking structures, nature's 3.8 billion years of research and development are inspiring a revolution in how we design, produce, and wear our clothes.

Introduction: The Hook

What if the solution to the fashion industry's massive waste and pollution problem has been growing in a field, floating in the ocean, and spinning silk in a tree all along? For billions of years, nature has been perfecting designs that are efficient, circular, and resilient. Instead of extracting from the planet, what if we learned from it? This is the promise of biomimicry, the practice of innovating by emulating nature's time tested patterns and strategies. For an industry in desperate need of a sustainable makeover, biomimicry offers not just a new source of inspiration but a blueprint for survival.



Core of fashion from the wild

The Problem: Fashion's Linear, Wasteful Model

Our current "take-make-waste" fashion model is fundamentally broken. It operates in direct opposition to how natural systems work.

- **Resource Depletion:** Conventional systems, like cotton farming, drain water and degrade soil biodiversity, creating monocultures where rich ecosystems once thrived.
- **Toxic Waste:** The dyeing and finishing of textiles pollute waterways with chemicals, harming aquatic life, a stark contrast to the clean, nutrient-cycling processes of a forest.

- **Mounting Waste:** With 92 million tons of textile waste generated annually, as noted in your previous issue, the industry is a testament to the failed "cradle-to-grave" model. In nature, there is no "grave"; one organism's waste is another's nutrient.

This linear system is not just unsustainable; it is illogical. To truly "Turn the Tide," we must look to a master designer: the natural world itself.

The Solution: Learning from Nature's Playbook

Biomimicry in fashion moves beyond using organic materials to fundamentally rethinking design principles. It asks: "How would nature solve this?"

1. Mimicking Form: The Blueprint for Efficiency

- **Example: The Kingfisher & The Bullet Train (and quieter textiles):** The Shinkansen bullet train in Japan was notoriously loud when exiting tunnels. Engineers modeled the train's nose after the kingfisher's beak, which slices into water with minimal splash. The result? A quieter, 15% faster, and more energy efficient train. This same principle of aerodynamic, drag-reducing shapes is now being applied to performance sportswear, reducing material use and energy expenditure for the wearer.
- **Image Suggestion:** A side-by-side visual comparing the kingfisher's beak entering water and the streamlined nose of the Shinkansen train.

2. Mimicking Process: Manufacturing Like a Spider

Example: Spider Silk: Spider silk, weight for weight, is stronger than steel and more flexible than nylon. It is also produced in water, at room temperature, and from digested insects a stark contrast to the energy-intensive, petrochemical based production of synthetic fibres.

Companies like Bolt Threads have mimicked this process by fermenting yeast with spider silk genes to create a biodegradable, high-performance protein fibre. This represents a shift from industrial chemistry to nature's elegant bio-assembly.



Spider Silk production

3. Mimicking Ecosystem: The Ultimate Circular Model

Example: The Lotus Effect & Self-Cleaning Fabrics: The lotus leaf is a symbol of purity because it stays impeccably clean. Under a microscope, its surface is covered in tiny, waxy bumps that cause water to bead up and roll off, picking up dirt along the way. Fabrics have been treated with nano coatings that mimic this "lotus effect," creating stain-resistant clothing without the need for toxic chemical treatments. This reduces the frequency of washing, saving water and energy.



The Importance: Why This Matters for Sri Lanka and Beyond

The shift to biomimicry is not just a technological curiosity; it is a strategic imperative.

- **For Biodiversity:** It changes our relationship with nature from one of extraction to one of observation and learning, inherently placing a higher value on preserving ecosystems as libraries of innovation.

- **For Climate Change:** By favouring low energy, biological processes over fossil fuel-dependent ones, biomimetic design can drastically reduce the carbon footprint of textile manufacturing.
- **For Green Entrepreneurship:** This is a golden opportunity. Sri Lanka, with its immense biodiversity, is a living laboratory for biomimetic innovation.

Imagine a local start-up developing water repellent fabrics inspired by Nelum leaves (lotus) or creating dyes from the structural colour of **Sri Lankan butterflies and peacocks**, eliminating toxic chemical dyes altogether. This is how we turn ecological knowledge into economic and environmental value.

Conclusion & Call to Action

Biomimicry offers a profound shift in perspective. The question is no longer "What can we take from nature?" but "What can we learn from it?" By studying the geometry of a pinecone that opens and closes without muscles, or the symbiosis of a coral reef, we can learn to create fashion that is adaptive, restorative, and truly integrated into the Earth's cycles.

Let us be the generation that stops fighting nature and starts learning from its genius. Look closer at the world around you—the spirals of a snail shell, the iridescence of a beetle, the resilience of a blade of grass. The secrets to a sustainable future are woven into the very fabric of life. It's time we started reading the instructions.

References:

- Benyus, J. M. (1997). *Biomimicry: Innovation Inspired by Nature*. HarperCollins.
- Baumeister, D., et al. (Eds.). (2022). *Biomimicry Resource Handbook: A Seed Bank of Best Practices*. Biomimicry Institute.
- The Biomimicry Institute. (2023). *How Does Biomimicry Work?* <https://biomimicry.org/whatis-biomimicry/>.
- Bolt Threads. (2023). *Microsilk™* <https://boltthreads.com/technology/microsilk/>.



Udara C. Rathnayake

Head of the Department (Acting)
Department of Textile, Fashion and Clothing
Technology
Faculty of Science
Sri Lanka Technology Campus

"LET'S TURN THE TIDE" CALLING ALL AUTHORS!

THE NEWSLETTER PUBLISHED BY,
GREEN PSYCHE ENVIRONMENTAL ASSOCIATION,
FACULTY OF LIVESTOCK FISHERIES & NUTRITION,
WAYAMBA UNIVERSITY OF SRI LANKA

"Turning the Tide" is a periodic newsletter published by the Green Psyche Environment Association of the Faculty of Livestock Fisheries and Nutrition at Wayamba University of Sri Lanka. Its primary objective is to provide an open platform for undergraduates, fostering awareness, discussion, and engagement in environmental and sustainability issues.

We hope this newsletter will inspire youth in Sri Lanka to reassess their social responsibility, gain a clearer understanding of our current environmental trajectory, raise awareness among their peers, and take meaningful actions towards a sustainable future/tomorrow.

We look forward to reading your thought-provoking contributions!

GUIDELINES:

- **Focus on Impact:** Make sure your submission clearly aligns with the theme, delivering a powerful takeaway that leaves a lasting impression.
- **Concise & Captivating:** Limit your piece to 700-1000 words, ensuring each word counts.
- **Engage Your Readers:** We prioritize articles that capture attention and inspire action, so craft a message that resonates.
- **Creative Freedom:** While your article structure is up to you, ensure it flows logically and effectively develops your topic.
- **Keep It Simple:** Strive for clarity and simplicity, avoiding unnecessary complexity.
- **Compelling Narrative:** Feel free to inject energy into your writing—craft a lively narrative that keeps readers hooked from start to finish.
- **Seamless Transitions:** Ensure smooth transitions between paragraphs, guiding the reader effortlessly through your thoughts.
- **Polished & Dynamic:** Lastly, make sure your grammar and language contribute to a dynamic, readable style.



KEY THEMES

Biodiversity

"Nurturing Nature's Diversity
for Better Tomorrow"

Climate Change

"Changing the Climate Story:
Awareness to Action"

Food and Nutrition security

"Sustaining tomorrow:
Empowering Nutrition for All"

Green Entrepreneurship

"Sustainable Success: Innovating
for a Greener Tomorrow"

Submit your Articles to:
greenpsychewusl@gmail.com

INTO THE CLUB

VISION

A life-sustaining civilization that ensures a healthy communication triad: human himself, human - human, human - nature.

MISSION

Actively dedicating for the building of the human resource that is required for the sustainable existence of life on Earth.



Dr. T. Ursula S. Peiris
Editor
Turn the Tide Newsletter



Bashitha Samarakoon
Designer
Turn the Tide Newsletter

OBJECTIVES

- Overcome the over-consumption mindset of Sri Lankans with regard to environment.
- To promote the positive attitudes among Sri Lankans regarding the well-being of the nature.
- To bring about a transformation of the public consciousness leading towards a sustainable lifestyle.
- To mediate the development of agriculture and natural environment aiming at a sustainable lifestyle.
- Creation and promotion of other activities that fulfil the aforementioned mission.
- Reduce the University's ecological footprint, improve quality of life on-campus, create a legacy of sustainability at Wayamba University, enrich the community and contribute to global sustainability.
- Cultivate self-sufficiency, land stewardship, and ethical consumerism in the minds of students and the community.
- Emphasize organic living practices and locally-centered lifestyles.
- Provide education, fellowship, activities, and opportunities through student participation in sustainability.

We gratefully acknowledge the hard work and participation of everyone who contributed to this endeavor.

Editorial board, Turn the tide Newsletter



TURN THE TIDE NEWSLETTER

Green psyche Environmental Association,
Faculty of Livestock, Fisheries and Nutrition,
Wayamba University of Sri Lanka.



Follow us on
Facebook