

MALAYSIA has spent millions of ringgit building smart cities. While this is certainly a positive step, one of our biggest challenges lies beyond urban centres – in our forests, rivers and wildlife corridors, which are becoming increasingly vulnerable to climate change, development and human activity.

Increasingly, we read about illegal logging in Kelantan, Pahang and Sarawak, to name a few, or wildlife wandering onto roads in search of food and habitat.

The reality is that this is not just a Malaysian issue. Around the world, we are facing an unprecedented convergence of environmental challenges: rising global temperatures, prolonged droughts, habitat fragmentation, pollution and rapid urbanisation.

These are just some of the many pressures threatening ecosystems today.

Traditional conservation is essential, but it is struggling to keep up with the scale and speed of these challenges.

Many conservation efforts still rely on manual surveys and reactive interventions, compounded by limited manpower and funding. So, how can conservationists respond to this crisis after significant damage has been done?

Think about this. If technology and artificial intelligence (AI) are transforming almost every industry, why shouldn't they also transform conservation and environmental protection?

#### Cost of getting it wrong

Have you ever wondered about the true cost of environmental degradation? We often think about the immediate impact – human lives lost, wildlife killed and homes destroyed. But really, at what cost?

According to global reinsur-

ance company Munich Re, natural hazards caused an estimated US\$224bil in losses worldwide in 2025.

Earlier this year, Australian bushfires in Victoria caused losses of approximately A\$200mil within three weeks.

Closer to home, I'm sure many of us remember the Sri Muda floods in 2021.

The Statistics Department said total economic loss was said to hit RM6.1bil. Of that, destruction to agriculture was RM90.6mil.

Malaysia has also recorded more than 66,000 human-wildlife conflict incidents between 2021 and 2024. According to the Natural Resources and Environmental Sustainability Ministry, these incidents resulted in losses amounting to RM46.5mil.

Yet, these figures tell only part of the story. While we readily quantify the impact on people and the economy, we rarely measure what nature itself has lost.

Far less attention is paid to the silent losses unfolding across forests, rivers and coastlines, where wildlife populations decline, habitats are fragmented and ecosystems suffer damage that may take decades to recover.

According to the United Nations (UN), up to one million species are threatened with extinction, 85% of wetlands have disappeared, and 14% of global coral reef cover was lost between 2009 and 2018.

More than half of global gross domestic product relies on nature, while more than one billion people depend on forests for their livelihoods.

What do these figures tell us? The longer intervention is delayed, the greater the environmental, economic and social costs.

When we talk about the cost of environmental degradation, the



**DR SHARLENE THIAGARAJAH**  
TM Research & Development CEO

first thing that often comes to mind is money. But perhaps the bigger question is: what does it mean for us?

Its impact extends far beyond financial losses. Environmental degradation accelerates climate change, threatens food security and ultimately affects our health.

Biodiversity loss threatens pollinators such as bees, butterflies and birds, affecting the fruits, vegetables and crops we rely on. As pollinator populations decline, agricultural productivity is affected, placing greater pressure on food security.

At the same time, degraded ecosystems reduce the organic matter in healthy soils, limiting the nutrients available to crops. As the nutritional quality of our food declines, so too can our long-term health and well-being.

Protecting biodiversity, therefore, is not simply about conserving wildlife – it is about safeguarding the natural ecosystem that sustains our climate, our food and, ultimately, ourselves.

#### A new outlook

The question now is: how do we respond?

Technology is enabling conservation to become more predictive and data-driven. While traditional conservation methods remain essential, they are no longer sufficient on their own to address today's environmental challenges.

This is because conservation efforts now depend on analysing increasingly complex environmental data – from land use and carbon emissions, to weather

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patterns and biodiversity trends.

AI is enabling scientists and conservationists to process vast amounts of environmental data more quickly and accurately.

The UN Food and Agricultural Organisation uses an open-sourced platform called System for Earth Observation Data Access, Processing and Analysis for Land Monitoring. It provides real-time data to users in 64 countries about their forests, including wildlife poaching.

Using AI for the purpose of tracking animals and insects is another clever way. With animals migrating during different seasons and more species becoming extinct each day, we need information on animal behaviour.

The ecosystem is very complex and must be condensed into maps and digital representations. Think AI-powered camera traps, acoustic sensors, drones and satellite imagery.

Rather than relying solely on observations after environmental damage has occurred, AI enables conservationists to measure ecological indicators alongside traditional assessments of human impact, identify changes as they happen and intervene before damage becomes irreversible.

These capabilities are already being applied here in Malaysia. At TM R&D, our advanced research on Smart Forestry AI Tools leverage AI-powered computer vision to automate forest inventory, enabling faster and more accurate environmental data collection to support biodiversity monitoring, sustainable forest management and conservation planning.

Field trials with the Forest Research Institute Malaysia or FRIM have demonstrated high detection accuracy and positive validation under actual forest conditions.

In many ways, AI is giving nature a digital voice – transforming complex environmental data into actionable insights that enable conservationists to make faster and better-informed decisions.

#### Is there hope?

The future of our environment depends on how well we anticipate risks, rather than simply respond to them.

Technology is no substitute for responsible environmental stewardship. Rather, it provides something previous generations never had – foresight.

By integrating AI and emerging technologies into conservation efforts, we have an opportunity to detect emerging threats earlier, better understand complex ecosystems and make more informed decisions.

Protecting biodiversity and enabling economic development should never be viewed as opposing goals. The resilience of our economies depends on resilient ecosystems that provide clean water, fertile soils, climate stability, food security and healthier communities.

The objective is not to choose between nature and progress, but to redefine progress itself.

Nature has spent millions of years perfecting its own systems. If technology can help us listen a little better, act a little sooner and protect a little more, then perhaps the smartest thing AI will ever do is help ensure that both people and nature continue to thrive together.

# Protecting nature in the age of AI

