Preserving Biodiversity, Promoting Biosecurity and Biosafety: Developing Country Perspectives

Keng-Yeang Lum

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KENG-YEANG LUM

CAB International Southeast and East Asia Regional Centre (CABI SEA)

ASEAN is host to seven of the world's 25 biodiversity hotspots. Failure of governments and their peoples to protect and conserve the region's rich biodiversity is one of the greatest threats to the over 500 million people of ASEAN. As in other areas of the developing world, biodiversity conservation demands a delicate balance between development and conservation. The region's rich biodiversity is inextricably linked to the livelihood of its people; about 65% of its population is dependent on its agricultural sector. The sector is a prime contributor to food security, employment, income generation and overall prosperity of the region. The linkage between biodiversity and agriculture is further emphasised as a result of global conventions and agreements that deal with the threats posed by invasive alien species to natural and agro-environments and issues of environmental sustainability.

Biosecurity, together with biosafety, proposes a strategic and integrated approach that encompasses policy and regulatory frameworks for analysing and managing relevant risks to human, animal and plant life and health, and associated risks to the environment. The concept of managing these risks in a holistic manner has, however, not yet been fully embraced by developing countries, where biosecurity continues to be managed on a sector basis, often with separate policy and legislative frameworks. The migration towards a more harmonised and integrated approach, with the different sectors and components of biosecurity working towards common goals to take advantage of the available synergies and complementarities is often plagued by difficulties in cross-institutional cooperation and commitment, and agreement on sharing of limiting human capacity and resources.

KENG-YEANG LUM first visited Australia as a Colombo Plan scholar to study agriculture at the University of Adelaide in 1966. As Chief Scientist he now leads a team of scientists in international development activities at CABI Southeast & East Asia. He chairs ASEANET, the Southeast Asian LOOP of BioNET International, is a member of the International Plant Protection Convention (IPPC) Technical Panel on Diagnostic Protocols, and has worked in various capacities with the AusAID-funded SPS Capacity Building Program, the ASEAN Australia Development Cooperation Program, the Department of Agriculture, Fisheries and Forestry, Australia, and the Asian Development Bank. He continues to lead various regional plant health capacity-building initiatives, including the ASEAN Regional Diagnostic Network.

Introduction

The United Nations Convention on Biological Diversity defines biodiversity as 'the variability among living organisms including, inter alia, terrestrial, marine and other aquatic systems and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems.' Biological diversity or biodiversity is the very heart of our environment and is the web of life that includes the full range of ecosystems, their component species and the genetic variety of those species produced by nature or shaped by men. It includes plants and animals, and the processes and inter-relationships that sustain these components. Southeast Asia, consisting of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam, which together form the Association of Southeast Asian Nations (ASEAN), is a treasure-trove of diverse plant and animal species. Despite occupying a meagre three per cent of the earth's total surface, the ASEAN region is home to some 20% of all known species of plants and animals, making it critically important to global environmental sustainability. The mountains, jungles, lakes,

rivers and seas of Southeast Asia form one of the biggest biodiversity pools in the world. More specifically, the region includes three mega-diverse countries (Indonesia, Malaysia and the Philippines); several bio-geographical units (e.g. Malesia, Wallacea, Sundaland, Indo-Burma and the Central Indo-Pacific); and numerous centres of concentration of restricted-range bird, plant and insect species. Southeast Asia's coral reefs are among the most diverse in the world. Common land and water borders have allowed the ASEAN member states to share many species that are biologically diverse from the rest of the world.

Threats to ASEAN biodiversity

Beneath the wealth of biodiversity in the region, loss of biodiversity is one of the greatest threats to the people of ASEAN; seven of the world's 25 recognised biodiversity hotspots are in the ASEAN region. Eighty per cent of the region's coral reefs are at risk. Drastic environmental changes coupled with human practices are causing serious harm to plants, animals and their habitats. Out of 64 800 species found in the region, 1312 are endangered. Many animal species may be lost as a result of deforestation, wildlife hunting, climate change, pollution, population growth and other causes. Many species are threatened with massive decline and extinction in Southeast Asia if governments and their citizens fail to protect and conserve the region's biodiversity. Biodiversity is under pressure from modern development and the demands of a growing human population. So, despite its great wealth and biodiversity, and dependence upon the products and services it provides, the ASEAN region is losing its biodiversity at an alarming rate.

Biodiversity and invasives

Invasive species are a major threat to our environment because they:

- change an entire habitat, placing ecosystems at risk
- crowd out or replace native species that are beneficial to a habitat, or
- damage human enterprise, such as fisheries, costing significant economic loss.

The introduction of invasive alien species into ecosystems affects indigenous species. A classic example is the case of the janitor fish which infested the Philippines' Laguna Lake, and disrupted balance in its ecosystem. There are many ways in which the introduction of non-native or exotic species negatively affects our environment and the diversity of life on our planet. Compared to other threats to biodiversity, invasive introduced species rank second only to habitat destruction.

Keeping potentially damaging invaders out is the most cost-effective way to deal with introduced species. Targeting common pathways by which invaders reach our shores can slow or stop their entry. Ship ballast water, wooden packing material and horticultural plants are three prominent pathways for invasion that could all be monitored or treated more rigorously. A species that is introduced despite precautions can sometimes be eradicated, especially if discovered quickly. Even if eradication fails, several technologies often can keep invasive species at acceptably low levels.

Traditionally, biological, chemical and mechanical control of invasives has had limited success. A newer approach to managing invaders is ecosystem management, in which the entire ecosystem is subject to a regular treatment that tends to favour adapted native species over most exotic invaders. The specific ways in which ecosystem management can be employed must be determined in each type of habitat.

Biodiversity and biosecurity

Biosecurity encompasses policy and regulatory frameworks to manage risks associated with agriculture and food production. This includes, for example, the introduction and release of 'living modified organisms' (LMOs) and 'genetically-modified organisms' (GMOs) and their derived products, the introduction and spread of invasive alien species, alien genotypes and plant pests, animal pests, diseases and zoonoses (diseases that can be transmitted from animals to humans).

Biodiversity and biosecurity are inextricably intertwined—a successful outcome for biosecurity is a successful outcome for biodiversity. A major driver for the future of the success of any national biosecurity system is the implementation and ongoing development of a national pre-emptive biosecurity strategy. In view of a number of developments, including globalisation, the rapid increase in transport and trade and technological progress, national and international frameworks and standards need to be developed and strengthened in order to regulate, manage and control biosecurity. Adequate biosecurity policy and

regulatory responses need to be developed to address some of the risks associated with agriculture and food production.

Countries are increasingly taking a holistic view and are combining these regulatory activities. This trend is expected to continue, although many developing nations have yet to embrace this concept. The role of international agencies, such as FAO, is vital in building on an already significant range of activities and outputs that address biosecurity, including international instruments, biosafety in relation to LMOs and GMOs, biosecurity in relation to invasive alien species and closely associated concerns for food, agriculture, fisheries and forestry.

Integrating biodiversity, biosecurity and sustainable development objectives

Challenged by the unprecedented loss of biodiversity in the region, the 10 ASEAN Member States are working together to protect their biodiversity. All ASEAN states are signatories to the Convention on Biological Diversity, the first global agreement to cover the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. By signing the convention, they committed to reducing biodiversity loss by 2010—the International Year of Biodiversity. The ASEAN states have also declared 27 areas as ASEAN Heritage Parks, and designated 1523 protected areas based on The World Conservation Union (IUCN) Category.

While the developing countries of Southeast Asia have yet to accord biodiversity conservation its rightful priority due to challenges of resource allocation and human capacity, there is growing awareness of the need to recognise this biodiversity as a treasure of biological resources that may be exploited for food production. However, the quest for agricultural and food productivity has brought to the forefront issues relating to sustainable agricultural development, which in turn directly affects the challenges of biodiversity conservation.

A common thread that runs across biodiversity and biosecurity objectives is the concern for the spread of invasive alien species (IAS). Developing countries lack the capacity to identify IAS to be able to effectively implement biosecurity objectives. They also lack the capacity to prepare inventories of their native biodiversity to be able to effectively carry out conservation measures. Taxonomic skills are key to understanding what biodiversity to conserve and protect, as well as the ability to identify invasive threats and biosecurity priorities and therefore raise levels of preparedness. A number of development assistance initiatives that support capacity-building in this area has been most useful, largely driven by Australian and New Zealand development assistance (AusAID and NZAid).

There is a need for developing countries to integrate or harmonise biodiversity conservation and agricultural production activities that have IAS as a common theme.

In recent years, some notable initiatives in the region have given impetus to the drive towards biodiversity conservation and sustainable development. The Heart of Borneo (HoB) Initiative is an ambitious conservation program encompassing 220 000 km^2 of highland forests at the core of Borneo Island. The project is supported by Brunei, Indonesia and Malaysia, and technically by WWF.

Other initiatives have arisen out of global demands for sustainability, for example the Roundtable on Sustainable Palm Oil (RSPO) formed in 2004 with the objective of promoting the growth and use of sustainable oil palm products through credible global standards and engagement of stakeholders. The RSPO is a not-for-profit association that unites over 400 stakeholders from seven sectors of the palm oil industry—oil palm producers, palm oil processors or traders, consumer goods manufacturers, retailers, banks and investors, environmental or nature conservation NGOs and social or developmental NGOs—to develop and implement global standards for sustainable palm oil. Palm oil is certified sustainable when determined to have been produced in a manner compliant with the set of RSPO Principles and Criteria as certified by accredited third parties.

Concluding remarks

Preserving biodiversity, and promoting biosecurity and biosafety, are merely different sides of the same coin, serving the common objectives of sustainability and food security and production. An equitable balance may be achieved as developing countries come to grips with global trends, build adequate capacity and rationalise resource

allocation, while seeking to improve their economies and food security.

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