

Taxonomy: Key to the conservation puzzle

Photo by Jeremy Mendoza

According to the Convention on Biological Diversity (CBD), out of an estimated 30 million species worldwide, taxonomists have identified some 1.78 million species in 250 years of research. About 10 percent of vertebrates, greater than 50 percent of terrestrial arthropods, and up to 95 percent of protozoa remain undescribed. Millions of species which may hold the key to food security, life-saving medicine, and other benefits, remain unstudied.

More species continue to be discovered in the ASEAN region each year. Unfortunately, almost the whole region is considered a biodiversity hotspot as the high number of endemic species is threatened by more than 70 percent loss of their original habitats. The sheer number of undiscovered species requires an army of scientists, each with their own area of expertise, to identify, name, classify, and study the millions of species on Earth.

The global decline in the number of taxonomists is even more apparent in the ASEAN region. Few academic institutions in ASEAN Member States (AMS) offer formal instruction in taxonomy and thus limits research in species and biodiversity conservation. ASEAN must improve expertise in taxonomy to properly document the region's rich biodiversity. Spurring large-scale interest in taxonomy and improving taxonomic capacity are



The CBD highlights the importance of taxonomy in the Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets, particularly Targets 9 and 19. Knowledge of species promotes the conservation of endemic and vulnerable species (Target 9) and prevents the establishment of invasive alien species. Improving taxonomic skills adds to the body of scientific knowledge, thus contributing to science-based approaches and decisions in biodiversity conservation and the achievement of Target 19.

fundamental to the reduction of global biodiversity loss, implementation of the CBD Strategic Plan for Biodiversity 2011–2020, and the attainment of Aichi Biodiversity Targets and Sustainable Development Goals.

Strengthening taxonomy in ASEAN

The CBD aims to reduce or remove taxonomic impediments through the Global Taxonomy Initiative (GTI) to improve decision-making in conservation, sustainable use, and equitable sharing of the benefits derived from genetic resources. It highlights issues, facilitates exchange of information, and promotes technical cooperation among Parties to prioritize efforts and generate greater support for taxonomy.

The ASEAN Member States recognize that taxonomy is crucial to the management and conservation of biodiversity. Efforts in taxonomy include the following:

1. Implementation of projects aligned with the Global Taxonomy Initiative Regional Action Plan (GTI RAP) 2010–2015.
2. Development of action plans and guidelines and establishment of technical working groups.
3. Operation of national biodiversity information and database system and Clearing-House Mechanism (CHM) that include taxonomic information.
4. Development and conduct of taxonomy projects, such as biodiversity surveys to provide baseline inventories and update databases.
5. Increased collaboration among various stakeholders on taxonomy research, information sharing, and other activities.
6. Expansion of *ex situ* programs by increasing institutions such as herbaria, botanical gardens, wildlife centers, natural history museums, and others.
7. Participation in biodiversity conferences with focus on taxonomy, documentation of traditional knowledge, production of communication, education and public awareness (CEPA) materials, and development of education and capacity building programs. These activities add to the body of work on taxonomy and raise awareness of the importance of taxonomy to biodiversity conservation.

Current capacity building activities on taxonomy in the ASEAN region

The Japan-ASEAN Integration Fund (JAIF), East and Southeast Asia Biodiversity Information Initiative (ESABII), and Ministry of the Environment, Japan (MoE-J), in partnership with ACB and AMS, have collaborated on a number of taxonomy capacity building projects. These focused on the

taxonomy of corals; freshwater and brackish water fish; dicotyledons, monocotyledons, bryophytes, and pteridophytes; economically important insects; plants on the nature trails of Gunung Mulu National Park, Malaysia; and high elevation vascular plants in Doi Inthanon National Park, Thailand. The activities also discussed Convention on International Trade of Endangered Species (CITES) policies, identification of threatened species, interface of protected areas databases, organization and mapping of biodiversity data and taxonomic information, invasive alien species, CBD Aichi Biodiversity Targets, CEPA of taxonomy and biodiversity, and the preparation of field guides.

Twenty-nine (29) training activities that benefited 683 ASEAN nationals were implemented in line with the GTI RAP 2010–2015, and provided inputs into the GTI RAP 2017–2025. In September 2017, AMS representatives, taxonomy experts, and members of the ACB Scientific Advisory Committee drafted the GTI RAP 2017–2025 in Kuala Lumpur, Malaysia, which details the objectives and strategic and specific actions to strengthen taxonomy in ASEAN. The GTI RAP 2017–2025 has the following goals:

1. Address taxonomic needs and strengthen capacities at national and regional levels based on priority needs assessment.
2. Support the establishment and maintenance of systems and infrastructure needed to obtain, collate, and curate biological specimens that are the basis of taxonomic knowledge.
3. Facilitate an improved and effective system to access taxonomic information through existing platforms, such as the Regional and National CHMs, among others.
4. Assist AMS in generating information needed for decision-making in conservation and sustainable use of biological diversity and its components.

The final GTI RAP 2017–2025 will be approved by the AMS.



Photo by Pamela Reblora



Call for Action

Improved scientific knowledge will help institutions prioritize taxonomic research and increase knowledge in biodiversity, functional ecology, and ecological processes, particularly of understudied and vulnerable habitats in a region that is undergoing rapid environmental change.

Some recommendations to support ASEAN taxonomy are:

1. Strengthen taxonomy in all levels of education.
2. Develop new generations of para-taxonomists and taxonomists.
3. Improve expertise in taxonomy by providing funding for deserving post-graduate students. Develop exchange programs to train government officials, protected area management staff, and academics in taxonomy. Develop both basic and advanced taxonomy training activities to accommodate varying levels of expertise.
4. Incorporate recommendations from the assessment of the GTI 2010–2015 into GTI RAP 2017–2025.
5. Implement approved GTI RAP 2017–2025.
6. Develop a long-term ASEAN program on taxonomy to consolidate and facilitate taxonomic research, update capacity in line with scientific and technological innovations, build a network of ASEAN taxonomists, and enable access to international taxonomy networks.
7. Review, publish, share, and popularize results of taxonomic research.
8. Develop a CEPA plan on taxonomy for AMS.
9. Share taxonomic information through the national Clearing-House Mechanisms.
10. Facilitate funding for *ex situ* collections such as herbaria and natural history museums.
11. Strengthen professional taxonomy organizations at the national and regional levels.

References

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Taxonomy

Key to the conservation puzzle

A region known for its biodiversity richness, ASEAN is also the most vulnerable with most member states facing tremendous threats to their natural wealth. Identifying species before they go extinct is thus crucial to determining priorities in biodiversity conservation.

The extent of undiscovered species is high for all other taxa

1,361
identified
reptiles

3,258
identified
birds

585
identified
amphibians

56,120
identified
plants

1,037
identified
mammals

Efforts to Strengthen Taxonomy in ASEAN

AP-BON
Asia Pacific Biodiversity
Observation Network



Partnerships



Trainings



Knowledge
Management

Ways Forward



Assess the Global Taxonomy
Initiative Regional Action Plan
2010–2015

Chart the future of taxonomy in
a Regional Action Plan for
Taxonomy 2017–2020



Survey taxonomy studies and
research in ASEAN



Develop a communication,
education, and public
awareness plan for taxonomy
in ASEAN



Make taxonomic information
interoperable among
databases in ASEAN Member
States



Improve *ex situ*
programs in the
region

