## Table of Contents

List of Tables, Boxes and Annexes ii  
Acronyms and Abbreviations iii  
Acknowledgments iv  
Background 5  
Opening Programme 8  
Keynote Message 11  
Overview and Objectives of the Workshop 14  
Keynote Session 15  
Key Findings of the Status of Agrobiodiversity in the ASEAN Member States 17  
Panel Sessions 18  
  Session 1: Governance, policies and relevant legal instruments on agrobiodiversity 20  
  Session 2: Conservation and sustainable use 20  
  Session 3: Gender and social contexts 21  
Reflections on the Workshop 22  
Mapping of opportunities for strategic cooperation on agrobiodiversity in the ASEAN 24  
Ways Forward and Recommendations 29  
Closing Programme 34
List of Tables and Annexes

Tables

Table 1. Key points and recommendations of keynote presentations 15
Table 2. Recommended actions for the conservation and sustainable use of agrobiodiversity in the ASEAN based on the CBD Programme of Work on Agricultural Biodiversity 23
Table 3. Indicative activities and areas for multi-sectoral collaboration for the conservation and sustainable management of agrobiodiversity in the ASEAN 27

Boxes

Box 1. The CBD Programme of Work (PoW) on Agricultural Biodiversity 25

Annexes

Annex 1. Programme 36
Annex 2: Resource speakers and their affiliation 44
Annex 3. Directory of participants 52
Annex 4. Slide presentations 57
### Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACB</td>
<td>ASEAN Centre for Biodiversity</td>
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<tr>
<td>AHPs</td>
<td>ASEAN Heritage Parks</td>
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<tr>
<td>AMCSU</td>
<td>Agrobiodiversity Mainstreaming, Conservation and Sustainable Use</td>
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<td>AMS</td>
<td>ASEAN Member States</td>
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<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
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<tr>
<td>ASPEN</td>
<td>ASEAN Strategic Plan on Environment</td>
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<tr>
<td>AWPE</td>
<td>ASEAN Work Plan on Education</td>
</tr>
<tr>
<td>BCAMP</td>
<td>Biodiversity Conservation and Management of Protected Areas in ASEAN</td>
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<td>BFN</td>
<td>Biodiversity for Food and Nutrition</td>
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<tr>
<td>CBD</td>
<td>Convention on Biological Diversity</td>
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<tr>
<td>COP</td>
<td>Conference of Parties</td>
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<tr>
<td>CIAT</td>
<td>International Center for Tropical Agriculture</td>
</tr>
<tr>
<td>CEPA</td>
<td>Communication, Education, and Public Awareness</td>
</tr>
<tr>
<td>CGIAR</td>
<td>Consultative Group on International Agricultural Research</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organisation of the United Nations</td>
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<tr>
<td>GIZ</td>
<td>Deutsche Gesellschaft für Internationale Zusammenarbeit</td>
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<tr>
<td>ICT</td>
<td>Information, Communication and Technology</td>
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<tr>
<td>IEC</td>
<td>Information, Education and Communication</td>
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<tr>
<td>IPBES</td>
<td>Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services</td>
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<tr>
<td>ISARD</td>
<td>Inclusive and Sustainable Agricultural and Rural Development</td>
</tr>
<tr>
<td>ITPGRFA</td>
<td>International Treaty on Plant Genetic Resources for Food and Agriculture</td>
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<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
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<tr>
<td>NASAPs</td>
<td>National Agrobiodiversity Strategy and Action Plans</td>
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<tr>
<td>PoW</td>
<td>Programme of Work</td>
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<tr>
<td>RAP</td>
<td>Regional Action Plan</td>
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<tr>
<td>REDD+</td>
<td>Reducing Emissions from Deforestation and Forest Degradation</td>
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<tr>
<td>SAC</td>
<td>Scientific Advisory Committee</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<tr>
<td>SEAMEO</td>
<td>Southeast Asian Ministers of Education Organisation</td>
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<tr>
<td>SEARCA</td>
<td>Southeast Asian Regional Center for Graduate Study and Research in Agriculture</td>
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<tr>
<td>SEAMEO BIOTROP</td>
<td>Southeast Asian Regional Center for Tropical Biology</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organisation</td>
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Acknowledgments

This regional workshop was made possible through the financial support of the European Union (EU) through the Biodiversity Conservation and Management of Protected Areas in ASEAN (BCAMP) Project. The ASEAN Centre for Biodiversity (ACB) and Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) are also grateful for Maejo University (MJU) for hosting the workshop.
Mainstreaming Agriculture in Biodiversity for Sustainable Development and Food Security in Southeast Asia

Summary Report of the Regional Workshop on Agrobiodiversity
Maejo University, Chiang Mai, Thailand
12–14 September 2017

Background

Agrobiodiversity refers to the variety of natural resources used for food and agriculture, and includes the interactions among genetic resources, the environment, and the management systems and practices used by food producers. Agriculture and biodiversity have been traditionally managed by separate sectors, but emerging issues call for multi-disciplinary and cross-sectoral collaboration to increase awareness of agrobiodiversity conservation, streamline cooperation, and make crucial information available for informed government planning and decision-making.

The Conference of Parties to the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) take into account the conservation and sustainable use of biological resources to secure livelihoods, food and nutrition, and in maintaining ecosystem services. Agrobiodiversity plays a pivotal role in building resource-based economies in Southeast Asia specifically towards achievement of inclusive and sustainable agricultural and rural development (ISARD) goals. Emerging challenges on the state of agriculture and biodiversity and the increasing demand for these resources emphasise the need to intensify efforts in raising awareness on agrobiodiversity conservation by streamlining collaborative undertakings and making crucial information known – to support government planning and decision-making for conservation of agricultural biodiversity.
With this in mind, the ASEAN Centre for Biodiversity (ACB) and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) signed a Memorandum of Understanding (MOU) for institutional cooperation on 01 July 2016 to pursue the common objective of building capacities of the ASEAN Member States (AMS) in biodiversity conservation, as this relates to agriculture and food. The two international organisations agree to cooperate in project development and implementation; information exchange; and capacity development on sustainable agriculture and biodiversity.

The first major event of this partnership was the conduct of the first Regional Workshop on Agrobiodiversity at Maejo University, Chiang Mai, Thailand on 12 – 14 September 2017. The workshop was jointly organised and funded by ACB, SEARCA, and Maejo University with financial assistance from the European Union (EU) through the Biodiversity Conservation and Management of Protected Areas in ASEAN (BCAMP) Project and technical support from Nagoya University, International Center for Tropical Agriculture, World Agroforestry Center, and Bioversity International.

The workshop was mainly a stocktaking activity that also supports CBD’s agenda of strengthening and mainstreaming biodiversity into the agriculture sector. Specifically, the workshop aimed to:

a. Provide a venue for sharing and reporting the status of, trends, and issues on agrobiodiversity in the region;

b. Enable Southeast Asian countries and other key stakeholders to level-off understanding on agrobiodiversity, its concept, related processes, and cross-cutting concerns;

c. Facilitate the exchange of knowledge, lessons learned, best practices, and innovative ideas among Southeast Asian countries and regional or international institutions, and other relevant stakeholders towards the conservation and sustainable use of agrobiodiversity; and

d. Identify and recommend regional mechanisms and platforms to strengthen cooperation within Southeast Asia for an effective response to challenges and drivers of change in agrobiodiversity.
With the theme “Mainstreaming Agriculture in Biodiversity for Sustainable Development and Food Security in Southeast Asia”, the regional workshop gathered more than 60 experts and representatives from different sectors and institutions working around the theme of agricultural biodiversity in the ASEAN Member States to discuss and share status and trends, including underlying causes of change and cross-cutting issues, and the knowledge of management and conservation practices in the region.

The two-day workshop featured a keynote session with discussions on linking agrobiodiversity with food systems and nutrition; experiences on mainstreaming agricultural biodiversity from the Biodiversity for Food and Nutrition (BFN) initiative, and other projects; sustainable agriculture and biodiversity in the context of the Sustainable Development Goals (SDGs); and issues in agrobiodiversity and gender. The workshop also included thematic sessions that tackled governance, policies, and relevant legal instruments on agrobiodiversity; conservation and sustainable use; and gender and social contexts (Annex 1).
Opening Programme

The participants were welcomed by Dr. Chamnian Yosraj, President of Maejo University. As an alumnus of the University of the Philippines Los Baños and SEARCA Graduate Fellowship Program, he expressed his joy at meeting friends at the workshop and honor to welcome guests from the AMS and experts from other countries. Maejo University is a proud partner of ACB and SEARCA for the Regional Workshop on Agrobiodiversity and he appreciated the opportunity to host the event. He stated his belief that the regional workshop will help raise awareness on agrobiodiversity and foster an intellectual climate of international collaborations, which has always been one of the university’s foremost concerns.

In his opening message, Atty. Roberto V. Oliva, Executive Director of ACB, thanked SEARCA for serving as a big brother during the formative years of ACB; Maejo University for hosting the activity; and the EU for its support of the workshop. The workshop was particularly significant as it was conducted during 50th Anniversary of the Association of Southeast Asian Nations (ASEAN) and aligns with the ASEAN Vision 2025. He reiterated the goal of the establishment of ACB in 2015, which reflects the goals of the Convention on Biological Diversity of facilitating the conservation, sustainable use, and fair and equitable sharing of the benefits from biodiversity. These goals aim to help ASEAN survive and prosper with the wealth of biodiversity within the region.
Atty. Oliva also highlighted the accomplishments of Dr. Nonn Panitvong, one of the ten ASEAN Biodiversity Heroes recognised by ASEAN and ACB for their contribution to biodiversity conservation in the region. As the ASEAN Biodiversity Hero from Thailand, Dr. Panitvong, who is a businessman and holds a PhD in Environmental Science at Kasetsart University, has made taxonomy more accessible to the public and has started the process of mainstreaming biodiversity conservation into policies, operations, products and services in his and in others’ businesses. His efforts highlight the role of all sectors in mainstreaming biodiversity in various sectors, including agrobiodiversity.

In conclusion, Atty. Oliva underscored the importance of the workshop as agrobiodiversity is crucial to alleviating hunger and poverty. He stressed, “If we lose our agrobiodiversity, hunger will set in. We must seize the moment and forge a stronger commitment to strengthen ASEAN agrobiodiversity.”

Mr. Xavier Canton-Lamousse, Project Manager, Operations Section, Delegation of the European Union to the Philippines, expressed his sincere gratitude to the Government of Thailand through the Ministry of Natural Resources and Environment and the Ministry of Agriculture and Cooperatives of Thailand, Maejo University, SEARCA, and ACB for hosting and organizing the event. The EU has a deep interest in biodiversity conservation and provides a strong response to global challenges and the 2030 agenda for development. The EU has five items in its priorities for action, specifically

“If we lose our agrobiodiversity, hunger will set in. We must seize the moment and forge a stronger commitment to strengthen ASEAN agrobiodiversity.”

- Atty. Roberto V. Oliva
People, Planet, Peace, Prosperity, and Partnership for achieving the 2030 agenda. As such, the EU and its Member States supports the conservation and sustainable management of all natural resources and the conservation of the biodiversity and ecosystems including forest, ocean, coastal areas, rivers and other ecosystems. The EU supports better governance and capacity building for the better management of sustainable resources, promoting the involvement of stakeholders and the respect for the right of all, including indigenous peoples and local communities.

The EU, together with its Member States, are making important contributions in protecting biodiversity in Southeast Asia where the challenges are huge and commensurate with the richness of the environment. The EU is very active at a regional level with different interventions including the Biodiversity Conservation and Management of Protected Areas Programme (BCAMP), a €10 million program, which has allowed to organise this workshop. Under the BCAMP program, an important component is to mainstream biodiversity conservation into national plans and in particular into land use and agriculture plans. He expressed, “I sincerely hope that this European contribution will make a difference and that this workshop will not just be another workshop but will significantly contribute to change the way biodiversity is addressed in national development plans, starting with agriculture.”

“I sincerely hope that this European contribution will make a difference and that this workshop will not just be another workshop but will significantly contribute to change the way biodiversity is addressed in national development plans, starting with agriculture.”

- Xavier Canton-Lamousse
Dr. Percy Sajise focused on the importance of the linkages between biodiversity and agriculture; biodiversity and the ASEAN Vision of Sustainable Development; status and capacity of achieving ASEAN biodiversity, agrobiodiversity conservation, and sustainable use targets; opportunities and challenges in biodiversity and agrobiodiversity conservation and sustainable use in the region; and ways forward for achieving a strategic plan for conserving ASEAN agrobiodiversity. He stated that biodiversity conservation and sustainable use underpins processes and multi-functionalities in food security, nutrition, and human health; sustainable livelihoods; poverty reduction and eradication; resilience of agricultural systems and communities; ecosystem services; and sustainable agriculture and landscapes. Biodiversity, in fact, is the heart of sustainable agricultural systems.

Biodiversity and the sustainable management of natural resources can be integrated into the ASEAN Vision 2025 by (a) integrating concerns into national, subnational, and local plans for development; (b) translating these priorities into budgetary allocations for research and development among concerned agencies at various hierarchical levels; and (c) providing the policy enabling environment to sustain and enhance the mainstreaming processes.

There are a number of issues and concerns in the sustainable conservation and use of agrobiodiversity. These include technical issues, such as the (a) kind of agrobiodiversity that needs to be conserved, requiring a better understanding of system and components and their relationships; (b) genetic erosion and rationalization of collections, particularly of wild relatives; and (c) valuation of economic, environmental, and cultural aspects of agrobiodiversity. There are also legal issues that have to be considered, including access, intellectual property rights, seed systems, markets, and biosafety.
SEARCA, Southeast Asian Regional Center for Tropical Biology (SEAMEO BIOTROP) and other Southeast Asian Ministers of Education Organisation (SEAMEO) Centers with related activities such as education, science, policy and capacity building in general are mandated to work on biodiversity conservation and sustainable management of natural resources, but need to work with officially designated ASEAN institutions.

In discussing the ways forward for ASEAN agrobiodiversity, Dr. Sajise made the following recommendations:

1. Start with what is already in place. Document good practices in deploying and managing agrobiodiversity in ASEAN. These should include information on their impacts for upscaling and wide scaling the development of a policy-enabling environment for promoting the conservation and sustainable use of agrobiodiversity and wide scaling for replication in the same eco-socio-cultural typologies in the region.

2. Research on the “hidden values” of agrobiodiversity to balance productivity objectives with sustainability through payments of these “hidden values”.

3. Enhance values of protected areas as food and nutrition baskets and providers of ecosystem services as a priority ASEAN agenda by improving funding, linking concerned ministries at national and regional levels, enhancing management of protected areas, and sustaining properly valued ecosystem services.

4. Develop a regional agrobiodiversity database.

5. Promote networking of seedbanks at the community, national, and regional levels to better respond to disasters and climate change for food and nutrition security.

6. Recognise outstanding biodiversity programs at the community, national, and regional levels through ASEAN incentives for biodiversity conservation.

7. Conduct capacity building for farmers, fisherfolk communities, and forest users using effective models and best practices.

8. Provide market incentives for the conservation and sustainable use of biodiversity.
9. Develop an ASEAN Consortium on Research for Biodiversity and Climate Change using existing platforms of national and regional institutions such as ACB, SEARCA, and BIOTROP and ASEAN University Network to maximise use of biodiversity for climate change adaptation and mitigation using existing institutions.

10. Improve inter-pillar coordination in ASEAN particularly in terms of complementarity for biodiversity and sustainable natural resource management.

Dr. Sajise concluded that even in a rapidly changing and increasingly globalised world, human society needs food, clothing, shelter, and medicines, and society will always be dependent on the basic functions and services of ecosystems. The demand for these biodiversity elements, and agrobiodiversity in particular, is growing as population expands, yet biodiversity is being lost at an unprecedented rate. Agrobiodiversity is nothing without the ability to use it particularly in the context of a food insecure and poverty–ridden society. A food secure and healthy future for human society will require not only that the world’s agrobiodiversity heritage is accessible to all but that all people will have the ability to use and benefit from it. A fair and transparent system for sharing both the resources and benefits arising from their use will move people closer to this goal.

“A food secure and healthy future for human society will require not only that the world’s agrobiodiversity heritage is accessible to all but that all people will have the ability to use and benefit from it. A fair and transparent system for sharing both the resources and benefits arising from their use will move people closer to this goal.”

- Dr. Percy E. Sajise
Ms. Arida provided an overview of the workshop and discussed the importance of agrobiodiversity particularly in the context of the Convention on Biological Diversity (CBD) and Sustainable Development Goals (SDGs). The CBD called for mainstreaming biodiversity into agriculture and fisheries and tourism and emphasized that agriculture depends on biodiversity and renewed a call for action to address unsustainable agricultural practices. The CBD Programme of Work on Agrobiodiversity aims to (a) promote the positive effects and mitigate the negative impacts of agricultural systems and practices on biological diversity in agro-ecosystems and their interface with other ecosystems; (b) promote the conservation and sustainable use of genetic resources of actual and potential value for food and agriculture; and (c) promote the fair and equitable sharing of benefits arising out of the use of genetic resources. Programme elements include:

1. **Assessments:** To provide a comprehensive analysis of status and trends of the world’s agricultural biodiversity and of their underlying causes (including a focus on the goods and services agricultural biodiversity provides), as well of local knowledge of its management.

2. **Adaptive management:** To identify management practices, technologies and policies that promote the positive and mitigate the negative impacts of agriculture on biodiversity.

3. **Capacity Building:** To strengthen the capacities of farmers, indigenous and local communities, and their organisations and other stakeholders, to manage sustainably agricultural biodiversity.

4. **Mainstreaming:** To support the development of national plans or strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration in sectoral and cross-sectoral plans and programs.

ACB signed a Memorandum of Understanding with SEARCA on 1 July 2016 to initiate regional cooperation on project development and implementation, information exchange and capacity development on their shared agenda on biodiversity conservation and sustainable agriculture. The three-year partnership serves as a relevant response to enhance the regional cooperation for research, knowledge management, and graduate education in biodiversity and agriculture.
The keynote session was composed of presentations on topics that encompass the objective of the workshop on mainstreaming and linking agrobiodiversity in food systems, nutrition, gender, governance, and sustainable development. The keynote presentations, their main points and recommendations and corresponding speakers are presented in Table 1 below.

Table 1. Key points and recommendations of keynote presentations

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<th>Topic and Speaker</th>
<th>Key Points and Recommendations</th>
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| **Linking agrobiodiversity with food systems and nutrition**<br>**Dr. Stefan de Haan**<br>Program Management Officer – Asia, International Center for Tropical Agriculture (CIAT), Viet Nam | Emphasised the need to:  
  a. promote in-depth research to unravel links between intraspecific diversity and nutrition outcomes;  
  b. understand ‘autochthonous’ food ways and ‘new/novel’ ways to link agrobiodiversity use to sustainable food systems and healthy diets;  
  c. document the impact of food system interventions on agrobiodiversity demand and diets; and  
  d. conduct monitoring at multiple scales from transitions of food systems to agrobiodiversity conservation status. |
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| **Mainstreaming agricultural biodiversity:** experiences from the Biodiversity for Food and Nutrition (BFN) initiative, and other GEF projects | There are growing concerns over the rapid disappearance of agricultural biodiversity, particularly traditional crops and wild species with nutritional potential. Addressing these issues can be done in several ways:  
   a. collaborate with Bioversity International on the development and implementation of the Agrobiodiversity Index;  
   b. facilitate reporting on agrobiodiversity to CBD, Aichi Biodiversity Targets, ITPGRFA, SDGs, and other global environmental instruments;  
   c. implement Programme of Work on Agrobiodiversity and develop Post-2020 Strategic Plan;  
   d. collaborate on new projects under the Global Environment Facility;  
   e. address research gaps and challenges and need for awareness raising, capacity building, policy analysis, and others; |
| **Sustainable Agriculture and Biodiversity: in the context of the SDGs** | Emphasised the need for an integrated approach that:  
   a. decouples food from deforestation and land degradation;  
   b. protects biodiversity and ecosystems that protect food system; and  
   c. foster biodiversity to increase resilience  
Programs should also emphasise benefit-sharing to derive premiums from conservation compatible practices, enhance market approaches, create supportive legal and policy environment for benefit-sharing, and improve collective capacities. |
| **Sustainable Agriculture and Biodiversity: in the context of the SDGs** | Gender roles are evident in traditional agricultural practices. A historical approach shows how people negotiate changes, by contextualising cropping practices, knowledge and environmental practices over time. Agrobiodiversity lies at the changing nexus of relations between people, resources, environment and wider political economy, in:  
   a. decision-making dynamics and relations at different scales;  
   b. assigning priorities to different activities;  
   c. allocating resources and benefits; and  
   d. accessing and controlling resources (e.g. land, water, time, credit, labor) |
Preluding the workshop and part of the stocktaking, a preliminary survey on the country status of agrobiodiversity was organised by SEARCA and ACB, with technical guidance and assistance from Dr. Wayne Nelles, Visiting Scholar of Chulalongkorn University and Technical Coordinator for the Regional Workshop on Agrobiodiversity. The survey questionnaires were sent to the environment ministries and representatives of the agriculture departments of the 10 ASEAN member states. Only five countries responded to the survey: Cambodia, Lao PDR (Plan Document only submitted, without Survey), Myanmar, the Philippines, and Viet Nam. The survey focused on the capacities and resources, enabling environment and tools, needs, and recommendations in agrobiodiversity; national reports and plans; regional trends; and ASEAN policies and plans for agrobiodiversity. The survey results were analysed by Dr. Nelles and integrated them with the literature study on regional trends and practical challenges on agrobiodiversity in the ASEAN.

Key findings and messages of the study include:

1. the belief that agrobiodiversity is "missing in action" in most current ASEAN Regional Agriculture-related ASEAN policies and plans;
2. that agrobiodiversity needs to be mainstreamed across all existing ASEAN plans associated with food and agriculture and across different ministries and departments; and
3. that agrobiodiversity should have its own ASEAN Regional Action Plan led by ACB-SEARCA with key partners.
There were three panel sessions that covered topics on: (i) governance, policies, and relevant legal instruments on agrobiodiversity; (ii) conservation and sustainable use; and (iii) gender and social contexts.

**Dr. Rosliza Binti Jajuli**  
Senior Scientist, Center of Agrobiodiversity and Environment Research, Malaysia  
- Developing policies or legal frameworks for the conservation of rural landscapes or agro-ecological areas in a fast-growing economy in Malaysia

**Dr. Lorna E. Sister**  
University Researcher, Institute of Crop Science, College of Agriculture and Food Science, University of the Philippines Los Baños (UPLB) Philippines  
- Integration of conservation of plant genetic diversity with landscape-level planning and decentralized government programming: Experience and lessons learned from "The Rice Roots Legacy"

**Ms. Clarissa C. Arida**  
Director, Programme Development and Implementation, ACB  
- Policy and management response options on the values of pollination and pollinators for food production

**Dr. Anja Gassner**  
Head, Research Methods Group, World Agroforestry Center (ICRAF), Philippines  
- Trees on farms for ecosystem services, food security, and climate change adaptation

**Dr. Kazuhiro Harada**  
Professor, Graduate School of Bioagricultural Sciences, Division of Regional Resources Management, Laboratory of Forest Resources Utilization, Nagoya University, Japan  
- Seeking alternative agricultural livelihoods from forest resource use by local people under the legal land and suppression: A case of Bukit Baliwan Selatan National Park in Indonesia
Dr. Pham Anh Cuong
Director, Biodiversity Conservation Agency (BCA), Vietnam
Environment Administration, Ministry of Natural Resources and Environment, Vietnam
- Sustainable practices and management of natural resources through biodiversity-based products in Hoàng Liên National Park (an ASEAN Heritage Park) in Vietnam

Dr. Siriwat Wongsiri
Professor, Graduate School, Maejo University, Thailand
- Scientific innovations and research on agrobiodiversity

Mr. Michael Victor
CTA/Team Leader – Knowledge Management and Policy Dialogue, The Agrobiodiversity Initiative (TABI)
- Integrating agrobiodiversity into local development programmes and related initiatives for building capacities of communities and government

Atty. Edna N. Maguigad
Regional Policy Advisor, Non-Timber Forest Products Exchange Program (NTFP-EP) Asia
- Promotion of traditional ecological knowledge and sustainable use of non-timber forest resources or biodiversity-based products for sustainable forest management and food security

Dr. Maria Celeste H. Cadiz
Program Head for Knowledge Management, SEARCA
- Linking and Learning with Agrobiodiversity Communities on the Ground

Ms. Deeppa Ravindran
Programme Coordinator, Pesticide Action Network Asia Pacific
- The crucial link between gender, capacity-building, and the local knowledge systems and its relevance to sustainable development
A total of 11 experts were invited to speak on these various topics. Key points and recommendations from the sessions are as follows:

**Session 1: Governance, policies and relevant legal instruments on agrobiodiversity**

- Policies and legal frameworks on biodiversity that support agrobiodiversity can be promulgated (e.g. agrobiodiversity in Malaysia is incorporated in the national policy on biodiversity)
- Gaps include the lack of data and insufficient manpower and lack of commitment to comply with biodiversity laws and strategies and global targets
- Mainstreaming efforts and management responses may have to consider gender; recognising indigenous knowledge systems and practices; participation and contribution of multiple stakeholders; access to information and genetic materials; improving current conditions for pollinators; transforming agricultural landscapes; transforming human relations with nature; rewarding farmers; investing in ecological structures such as protected areas, supporting landscape planning

**Session 2: Conservation and sustainable use**

- There are a number of projects that can serve as models for agrobiodiversity that integrate management approaches which strengthen ecosystem services, food security, and climate change adaptation but many of them are invisible to national plans and strategies
- Implementation of projects in protected areas and ASEAN Heritage Parks (AHPs) present possibilities for ASEAN agrobiodiversity.
- There is a growing interest in agrobiodiversity for tourism, along with increased awareness of the benefits of protected biodiversity to sustainable agriculture, in which may also be a source of alternative livelihoods for local communities (e.g. facilitated tourism to bee farms)
• Harmonise agricultural activities within national parks particularly when these provide alternative livelihoods. Such activities, though, can be conducted in buffer zones and degraded forest areas.

Session 3: Gender and social contexts

• The crucial link between gender, capacity building, and local knowledge systems and its relevance to sustainable development cannot be underscored enough (e.g. properly managed small agroecological farms can be more productive than large industrial scales which can secure livelihoods for smallholder farmers)

• Various models, strategies, and platforms that link agrobiodiversity communities on the ground show positive results and provide lessons for other communities and organisations to learn from.

• Information, Communication and Technology (ICT) does not work on its own, but can be strong enablers for more effective project results can help facilitate an effective platform for agrobiodiversity across sectors and levels.
These are the various lessons and insights, summarised from the many discussions in the workshop:

a. Significance of agrobiodiversity

Agrobiodiversity is a subset and central to overall biodiversity. Its use and conservation are strongly shaped by social roles, relations, and changes. Agrobiodiversity and its conservation and management are dynamic, multifaceted, multi-dimensional, and mostly context-specific, but approaches should consistently sustain life.

b. Policies, strategies, and legal frameworks

Policies and legal frameworks for conservation of rural landscapes should mainstream agrobiodiversity. There are many mainstreaming efforts but these are not concerted and not well communicated/lobbied for inclusion in regional strategic plans. Mainstreaming biodiversity in agricultural landscape approaches and scaling up of sustainable practices and activities will ensure that communities see the values in economic terms of the conservation efforts. Developing strategies and regulations for mainstreaming biodiversity in agriculture have to start from the field as they provide information on the real conditions and needs of stakeholders. This will help decision makers and other stakeholders to develop effective strategies and actions plan on strengthening agrobiodiversity.
c. Linking agrobiodiversity with other sectors and issues

The interaction and links between agrobiodiversity and other issues should be emphasised to underscore its importance in biodiversity. These other concerns include food systems, nutrition, ecosystem services, scientific innovation, traditional ecological knowledge, and sustainable production and consumption, among other issues.

d. Capacity building

An inter-sectoral (covering forest, agriculture, and conservation sectors) is necessary to emphasise the need for cooperation in agrobiodiversity. There are a number of very good initiatives, but there is plenty of disconnect in relation to collective efforts and methods.

e. Learning from successful initiatives

There are successful models to learn from, such as the Trees on Farms for ecosystem service and linking and learning with agrobiodiversity communities on the ground.

f. Information, Education and Communication (IEC)/Communication, Education, and Public Awareness (CEPA)

It is important to raise awareness of the importance of agrobiodiversity as it impacts the well-being of people.
One of the expected main outputs of the workshop is a draft map of opportunities for strategic cooperation on agrobiodiversity vis-a-vis the relevant global and regional frameworks and targets on sustainable development, biodiversity conservation, food security, and climate change resilience and identify action points/elements towards an action plan on agrobiodiversity in the ASEAN. Key areas for discussion are elements of the CBD Programme of Work (PoW) on Agrobiodiversity, which are: assessment, innovations and best practices, capacity building, and mainstreaming.

**Methodology for the mapping exercise**

Participants of the workshop were divided into four groups to identify opportunities for strategic cooperation on agrobiodiversity vis-a-vis the relevant global and regional frameworks and targets on sustainable development, biodiversity conservation, food security, and climate change resilience and identify action points/elements towards an action plan on agrobiodiversity in Southeast Asia.

Key areas for discussion, in which the groupings were based, are elements of the CBD Programme of Work (PoW) on Agricultural Biodiversity:

1. Assessment
2. Adaptive Management/Innovations and Best Practices
3. Capacity Building
4. Mainstreaming

The groups presented their outputs using the Bus Stop approach, where groups moved from one station to another to hear about the outputs of each group. The recommended actions according to elements of the Programme of Work on Agricultural Biodiversity are presented in Table 2.
### Box 1. The CBD Programme of Work (PoW) on Agricultural Biodiversity

The PoW aims to promote the positive effects and mitigate the negative impacts of agricultural systems and practices on biodiversity in agro-ecosystems and their interface with other ecosystems; promote the conservation and sustainable use of genetic resources of actual and potential value for food and agriculture; and promote the fair and equitable sharing of benefits arising out of the use of genetic resources. The elements of the PoW are Assessment, Adaptive Management/Innovations and Best Practices, Capacity Building, and Mainstreaming.

### Table 2. Recommended actions for the conservation and sustainable use of agrobiodiversity in the ASEAN based on the CBD Programme of Work on Agricultural Biodiversity

<table>
<thead>
<tr>
<th>CBD PoW Element</th>
<th>Objectives</th>
<th>Recommended Actions</th>
</tr>
</thead>
</table>
| 1. Assessments  | To provide an overview of the status and trends of the world’s agricultural biodiversity, their underlying causes, and knowledge of management practices | • Promote agrobiodiversity report into national biodiversity reports and improve reporting systems and mechanisms because current reports do not cover agrobiodiversity.  
• Conduct systematic assessments of genetic, functional, and multifunctional diversity in agroecosystems because agrobiodiversity currently focuses on genetic diversity.  
• Create a task force and programme to enhance agrobiodiversity.  
• Create projects to conserve and utilise local varieties to bring local products to the market and commercialise agrobiodiversity products.  
• Create agrobiodiversity sharing platform because data is scattered and out of date.  
• Strengthen national and regional advocacy for agrobiodiversity.  
• Address issues of networking and mainstreaming of biodiversity in agriculture. |
<table>
<thead>
<tr>
<th>CBD PoW Element</th>
<th>Objectives</th>
<th>Recommended Actions</th>
</tr>
</thead>
</table>
| 2. Innovations and Best Practices (Adaptive Management) | To identify innovations & good practices (adaptive management), technologies and policies that promote the positive effects and mitigate the negative impacts of agriculture on biodiversity, and enhance productivity and the capacity to sustain livelihoods, by expanding knowledge, understanding and awareness of the multiple goods and services provided by the different levels and functions of agricultural biodiversity | These are recommended measures to ensure that agrobiodiversity will continue to provide long-term benefits and how to add value to products to make them more attractive in the market:  
• Ensure sharing and integration in knowledge management  
• Document innovations and good practices  
• Build on local conservation knowledge and practices  
• Emphasise gender issues, the youth and other vulnerable groups  
• Raise awareness at the national and ASEAN level  
• Create supportive and enabling policies such as national and regional frameworks  
• Create partnerships and networks  
• Maintain ecosystem and cultural services for human health, food security and nutrition, sustainable livelihoods, and conservation and sustainable use  
• Create value chain opportunities for agrobiodiversity |
| 3. Capacity building | To strengthen the capacities of farmers, indigenous and local communities, and their organisations and other stakeholders, to manage agricultural biodiversity sustainably so as to increase their benefits, and to promote awareness and responsible actions | For Farmers, Indigenous Peoples and Local Communities, Women’s Groups:  
• Conduct training/cross visit  
• Develop extension programs such as a farmers’ yield school  
• Give incentives  
• Conduct pilot projects such as on-farm demonstrations  
• Celebrate farmer yield days  
For Government (policy-makers), Ministries of Education, Agriculture, Environment, and others:  
• Set up coordinators and committee on agrobiodiversity (at national level) |
<table>
<thead>
<tr>
<th>CBD PoW Element</th>
<th>Objectives</th>
<th>Recommended Actions</th>
</tr>
</thead>
</table>
|                | • Conduct trainings, forums, workshops, conferences, and roundtable discussions  
• Provide education on and promote agrobiodiversity |  
For Universities, Vocational School:  
• Develop curriculum and short courses on agrobiodiversity  
• Set up degree, professional program on agrobiodiversity  
• Conduct research and development  
• Set up scholarships  
• Provide incentives  
For Schools (teachers, students):  
• Provide training and curriculum on food education and food systems  
• Create school gardens  
• Use field trips  
For Private sector (with emphasis on gender), Non-government organisations, Agriculture entrepreneurs, Organic farms, Agrotourism groups, Agrobiodiversity champions:  
• Conduct training  
• Provide incentives  
• Recognise with awards  
For Media, Agrobiodiversity champions:  
• Use TV programs, radio, internet, and social network to promote agrobiodiversity  
• Develop videos and other material to promote nutritional benefits of agrobiodiversity |
<table>
<thead>
<tr>
<th>CBD PoW Element</th>
<th>Objectives</th>
<th>Recommended Actions</th>
</tr>
</thead>
</table>
| 4. Mainstreaming | To support the development of national plans and strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration in sectoral and cross-sectoral plans and programmes | • Set up national action plan for agrobiodiversity  
• Promote agrobiodiversity through national protected areas  
• Strengthen research and development on agrobiodiversity by implementing R&D activities and promoting cooperation  
• Mainstream nutrition-sensitive agriculture in other sectors such as land use planning, Reducing Emissions from Deforestation and Forest Degradation (REDD+), and other sectoral plans  
• Document existing agrobiodiversity initiatives including traditional knowledge  
• Document and share best practices on agrobiodiversity  
• Promote ASEAN as the agrobiodiversity hub/food cradle of the world  
• Promote organic agriculture/agricultural tourism through a sufficiency economy policy  
• Implement Payments for Ecosystem Services (with Viet Nam as model) / valuation of agrobiodiversity ecosystem services e.g. pollination  
• Create livelihood options  
• Develop formal degree program on agrobiodiversity or mainstream agrobiodiversity into the curriculum (primary and secondary, higher education, undergraduate and graduate students)  
• Create knowledge portal/platform for awareness raising  
• Include agrobiodiversity in national and international celebrations (e.g. International Day for Biodiversity)  
• Conduct capacity building-learning events, workshops, conferences, and policy roundtable discussions |
The Regional Workshop gathered a number of recommendations and set and follow-up actions. They were a broad range of ideas coming from both organisers and participants that can be summarised into five main components: (i) development of policies and strategies; (ii) capacity building; (iii) networking and collaboration; (iv) IEC and CEPA; and (v) programs and activities.

The key recommendations for collective action/collaboration on agrobiodiversity in the ASEAN are presented in Table 3.

Table 3. Indicative activities and areas for multi-sectoral collaboration for the conservation and sustainable management of agrobiodiversity in the ASEAN

<table>
<thead>
<tr>
<th>Areas for Collaboration</th>
<th>Objectives</th>
<th>Recommended Actions</th>
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</thead>
</table>
| 1. Development          | 1.1. Strengthen the role of the key institution/government in developing the  | • Build on what communities and local government units have, know, and can do  
| of policies and          | policy and strategy on agrobiodiversity.                                     | • Sustain actions by elevating them to national policy level and help raise national awareness of the importance of agrobiodiversity              |
| strategies for           |                                                                             |                                                                                                                                                |
| agrobiodiversity        |                                                                             |                                                                                                                                                |
| 1.2. Create a strategy  |                                                                             | • Strengthen the agrobiodiversity framework in protected areas  
| for agrobiodiversity     |                                                                             | • Work to Draft and Implement an ASEAN Regional Action Plan (RAP) on Agrobiodiversity Mainstreaming, Conservation and Sustainable Use (AMCSU),  |  
| conservation and         |                                                                             | 2017–2020  
<p>| management that is       |                                                                             | • Implement RAP-AMCSU approved by AMS under CBD Programme of Work on agricultural biodiversity. Design, secure adequate funding for and at least four major new interrelated projects (with sub- |<br />
| ready for a changing     |                                                                             |                                                                                                                                                |
| context and considers    |                                                                             |                                                                                                                                                |
| an iterative diagnosis–  |                                                                             |                                                                                                                                                |
| innovation–evaluation/  |                                                                             |                                                                                                                                                |
| feedback cycle and      |                                                                             |                                                                                                                                                |
| institutional reforms/   |                                                                             |                                                                                                                                                |
| adaptation to change.    |                                                                             |                                                                                                                                                |</p>
<table>
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<tr>
<th>Areas for Collaboration</th>
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<th>Recommended Actions</th>
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<tbody>
<tr>
<td></td>
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<td>components) to support Assessments; Innovations, Best Practices, or Adaptive</td>
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<tr>
<td></td>
<td></td>
<td>• Management; Capacity-building; and Mainstreaming</td>
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<td></td>
<td></td>
<td>• Borrow/Adapt data gathering work and scientific committee model initiated by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) on Pollinators led by United Nations Development Programme (UNDP), United Nations Educational, Scientific and Cultural Organisation (UNESCO), United Nations Environment Programme (UNEP), and Food and Agriculture Organisation of the United Nations (FAO) with partners. Broaden and apply to agrobiodiversity as a whole</td>
</tr>
<tr>
<td>1.3. Encourage cross-sectoral and interdisciplinary collaboration engaging intergovernmental, academic, civil society organisations, farmer groups, and other partners</td>
<td>• Support integration with complementary or parallel processes in different sectors</td>
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<tr>
<td></td>
<td>• Link to ASEAN Work Plan on Education [AWPE], 2016–2020 led by Thailand</td>
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<td></td>
<td>• Invite UNESCO, led by Philippines, to engage for Agrobiodiversity Mainstreaming</td>
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<td></td>
<td>• Incorporate local community-level consultations/input at national level consultation</td>
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<td>• Develop (and begin to implement) full National Agrobiodiversity Strategy and Action Plans (NASAPs) for all AMS through a new collaborative applied cross-learning effort between and among AMS, scientists, local community governments, farmer groups, other partners, and donors</td>
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<tr>
<td>Areas for Collaboration</td>
<td>Objectives</td>
<td>Recommended Actions</td>
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</table>
|                         | 1.4. Mainstream agrobiodiversity into institutional mandate of ACB and SEARCA | • Highlight agrobiodiversity in other platforms and projects of ACB, i.e. develop targets for ASEAN Strategic Plan on Environment (ASPEN) based on results of the Regional Workshop on Agrobiodiversity  
• For ACB to support and promote agrobiodiversity initiatives at the regional level through a number of mechanisms in place, i.e. ASEAN Conference on Biodiversity and AHP Conferences, include in the work plan of the ACB Scientific Advisory Committee (SAC), and current project portfolios with EU and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)  
• SEARCA to use existing information platforms and portals to discuss agrobiodiversity concerns, i.e. learning events which can be tailored to agrobiodiversity; organise policy roundtable discussions on areas of interest in terms of research and development |
| 2. Capacity building    | 2.1. Build and strengthen the capacity of key institutions/governments in Southeast Asia to implement initiatives related to agrobiodiversity | • Conduct workshops together with forest and conservation sectors to develop a pilot project for each ASEAN Member State |
| 3. Networking and collaboration | 3.1. Strengthen cooperation with other stakeholders and donors on implementing an action plan for agrobiodiversity | • Mobilise other networks and partners, as part of this program of work on agrobiodiversity  
• Facilitate interdepartmental institutional linkage at the higher level |
<table>
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<tr>
<th>Areas for Collaboration</th>
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<th>Recommended Actions</th>
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<tbody>
<tr>
<td>3.2. Create opportunities for strategic cooperation on agrobiodiversity, food security, and climate change resilience</td>
<td>• Establish 10 national committees and one ASEAN regional multi-disciplinary scientific committee on agrobiodiversity to conduct ongoing policy-relevant, participatory, applied research, and peer-reviewed assessments in collaboration with governments, extension agencies, and regional or international organisations. These scientific committees may become an <em>ad hoc</em> or permanent advisory group of science experts under ACB oversight.</td>
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<tr>
<td>4. Information, Education and Communication (IEC) / Communication, Education, and Public Awareness (CEPA)</td>
<td>4.1. Strengthen education and communication on agrobiodiversity among relevant sectors at all levels</td>
<td>• Include curriculum on agrobiodiversity in the school system • Create activities to attract the younger generation and involve them in agrobiodiversity</td>
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<tr>
<td></td>
<td>4.2. Create a better understanding of agrobiodiversity among those who facilitate conservation and sustainable use of agrobiodiversity</td>
<td>• Develop materials that highlight agrobiodiversity and its importance, preferably in the local language. This will require pooling of resources and communication experts to hit appropriate targets. • Raise the importance of tuber crop in agrobiodiversity</td>
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<tr>
<td></td>
<td>4.3. Document good practices in managing agrobiodiversity to help develop a policy enabling environment for promoting conservation and sustainable use of agrobiodiversity and possible replication in other countries.</td>
<td>• Develop a publication in mainstreaming agricultural biodiversity • Draft and publish the 1st ASEAN Regional Report on State of Agrobiodiversity by early 2020, included as a component of any reporting to the CBD Conference of Parties (COP) regarding the assessment of the Aichi Biodiversity Targets (drafting and publication follows that of the ASEAN Biodiversity Outlook 2 production processes)</td>
</tr>
<tr>
<td>Areas for Collaboration</td>
<td>Objectives</td>
<td>Recommended Actions</td>
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<tr>
<td>5. Development of programs and activities</td>
<td>5.1. Strengthen infrastructure development for ex situ and in situ conservation of agrobiodiversity resources</td>
<td>• Develop projects toward improving diversification of food products by local people</td>
</tr>
</tbody>
</table>
|                         | 5.2. Advance comprehensive systematic, policy-relevant research for agrobiodiversity | • Conduct a comprehensive mapping of Agrobiodiversity (species, seeds, data-bases, data-collection tools, methods and scientific resources, etc.) as well as management, monitoring and oversight capacities and needs within AMS  
• Conduct stakeholder mapping/network mapping of actors in agrobiodiversity including farmer groups, government, non-government organisations, academe, and others.  
• Complete and elaborate the e-mail survey on Agrobiodiversity status in the AMS, with follow-up interviews, field visits and national consultations when/where feasible  
• Conduct agrobiodiversity-related research in protected areas  
• Establish a platform where research can be done in wetlands and Lower Mekong floodplain areas such that local people and small holdings can be convinced and profoundly comprehend the importance of agrobiodiversity and conservation.  
• Gather new and sufficient data to fairly assess the status and trends of pollinators in Southeast Asia (called for by IPBES) analysing broader agrobiodiversity links. |
<table>
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<tr>
<th>Areas for Collaboration</th>
<th>Objectives</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3. Pilot an ASEAN Regional Agrobiodiversity Index (building on Bioversity International’s recent conceptual work)</td>
<td>• Test the ASEAN Regional Agrobiodiversity Index model, which could also be compared with and scaled-up in other regions – in cooperation with Consultative Group on International Agricultural Research (CGIAR) and other experts.</td>
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</table>

**Closing Programme**

Dr. Gil C. Saguiguit, Jr., Director of SEARCA, stressed the need to highlight the important, but not yet widely recognised, link between biodiversity and agriculture. He stated that “Since the beginning, we have recognised that biodiversity conservation at the heart of natural resource management, is key to achieving Inclusive and Sustainable Agricultural and Rural Development (ISARD), which happens to be the thematic focus of SEARCA’s Tenth Five-Year Plan. Under this Plan, the Center adheres to the idea that a healthy environment and natural resource base is prerequisite to agricultural productivity and in turn to economic and overall development.” He stated that the workshop serves as the first groundbreaking step towards the development of a regional action plan on agrobiodiversity mainstreaming, conservation, and sustainable use. In consultation with the participants and other agrobiodiversity experts, the identified action points will be fine-tuned and packaged into a strategic plan of action through the relevant ASEAN working groups and processes, before it is presented to two ASEAN sectoral bodies (ASEAN Socio-cultural Community and ASEAN Economic Community) for approval.

Ms. Clarissa C. Arida thanked Dr. Saguiguit for his kind words regarding ACB. She also thanked ACB partners, particularly SEARCA and Maejo University, and the representatives from the various organisations for the interesting presentations and their support for this first regional workshop on agrobiodiversity.

Dr. Weerapon Thongma, Vice President for Student Development and Alumni Relations, Maejo University, thanked everyone for coming to Maejo University. He stated that thousands of students and tourists come to Maejo University to learn about agriculture and other programs. He thanked everyone for coming to see the living centers at Maejo University.
Annexes
Mainstreaming Biodiversity in Agriculture for Sustainable Development and Food Security in Southeast Asia

REGIONAL WORKSHOP ON AGROBIODIVERSITY

Program of Activities

12-14 September 2017
Maejo University, Chiang Mai, Thailand
I. Rationale

Agricultural biodiversity or agrobiodiversity is defined as the "variety and variability of animals, plants and micro-organisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries." It is also described as the "interactions among genetic resources, the environment, and the management systems and practices used by farmers" (FAO 1999, CBD).

The Conference of Parties to the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) take into account the conservation and sustainable use of biological resources to secure livelihoods, food and nutrition, and in maintaining ecosystem services. Agrobiodiversity plays a pivotal role in building resource-based economies in Southeast Asia specifically towards achievement of inclusive and sustainable agricultural and rural development (ISARD) goals.

Persistent pressures from various drivers (population, land conversion, changing food consumption pattern and climate change) led to the shift from traditional and sustainable systems to more intensive agricultural production approaches in Southeast Asia. Agrobiodiversity cuts across a multitude of concerns, thus, requiring collaboration across disciplines and sectors. Building this synergy between biodiversity and the different sectors was particularly underlined in the Second ASEAN Conference on Biodiversity (ACB2016) held in February 2016 in Bangkok, Thailand. This makes it imperative to seek approaches on food production that underpin biodiversity conservation in agrobiodiversity.

Thus, there is a need to intensify efforts in raising awareness on agrobiodiversity conservation by streamlining collaborative undertakings and making crucial information known - to support government planning and decision-making for conservation of agricultural biodiversity. Hence, the conduct of this regional workshop on agrobiodiversity for Southeast Asia.

II. Objectives of the Workshop

The regional workshop will gather different sectors and institutions working around the theme on agricultural biodiversity in the region to discuss and share status and trends, including underlying causes of change and cross-
cutting issues, and the knowledge of management and conservation practices in the region. The workshop is basically a stocktaking activity that also supports CBD’s agenda of strengthening and mainstreaming biodiversity into the agriculture sector.

Specifically, the workshop aims to:

• Provide a venue for sharing and reporting the status of, trends, and issues on agrobiodiversity in the region;
• Enable Southeast Asian countries and other key stakeholders to level-off understanding on agrobiodiversity, its concept, related processes, and cross-cutting concerns;
• Facilitate the exchange of knowledge, lessons learned, best practices, and innovative ideas among Southeast Asian countries and regional or international institutions, and other relevant stakeholders towards the conservation and sustainable use of agrobiodiversity; and
• Identify and recommend regional mechanisms and platforms to strengthen cooperation within Southeast Asia for an effective response to challenges and drivers of change in agrobiodiversity.

III. Expected Output

It is anticipated that after the workshop the participants will be able to identify or map the opportunities for strategic cooperation on agrobiodiversity in Southeast Asia vis-à-vis the relevant global and regional frameworks and targets on sustainable development, biodiversity conservation, food security, and climate change resilience.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>08:30 - 10:00</td>
<td>A. Opening Ceremony</td>
</tr>
<tr>
<td></td>
<td>i. Welcome Speeches</td>
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<tr>
<td></td>
<td>Dr. Channian Yosraj</td>
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<tr>
<td></td>
<td>President, Maejo University</td>
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<tr>
<td></td>
<td>Atty. Roberto V. Oliva</td>
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<td></td>
<td>Executive Director, ACB</td>
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<tr>
<td></td>
<td>Mr. Xavier Caron-Lamousse</td>
</tr>
<tr>
<td></td>
<td>Project Manager, Operations Section</td>
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<td></td>
<td>Delegation of the European Union to the Philippines</td>
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<td></td>
<td>ii. Introduction of the Keynote Speaker</td>
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<tr>
<td></td>
<td>Dr. Bessie M. Burgos</td>
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<td></td>
<td>Program Head for R&amp;D, SEARCA</td>
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<tr>
<td></td>
<td>iii. Keynote Speech</td>
</tr>
<tr>
<td></td>
<td>Dr. Percy E. Sajise</td>
</tr>
<tr>
<td></td>
<td>Biodiversity International Honorary Research Fellow, Member of the</td>
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<td></td>
<td>Advisory Group to the Secretariat of the Commission on Genetic</td>
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<td></td>
<td>Resources for Food and Agriculture of the UN-FAO, Adjunct</td>
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<tr>
<td></td>
<td>Professor, University of the</td>
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<td></td>
<td>Philippines Los Ballos-School of</td>
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<td></td>
<td>Environmental Science and</td>
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<td></td>
<td>Management, and SEARCA Senior Fellow</td>
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<td></td>
<td>iv. Overview of the Workshop</td>
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<tr>
<td></td>
<td>Ms. Clarissa C. Arida</td>
</tr>
<tr>
<td></td>
<td>Director, Programme Development and Implementation, ACB</td>
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<tr>
<td></td>
<td>v. Introduction of Participants</td>
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<tr>
<td></td>
<td>Ms. Claudia B. Binondo</td>
</tr>
<tr>
<td></td>
<td>Project Development Officer, ACB</td>
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<tr>
<td></td>
<td>Master of Ceremonies</td>
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<td></td>
<td>Ms. Kanokwan Klinthom, International Relations Officer, MJU</td>
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<tr>
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<td>10:00 - 10:25 Morning Break and Photo</td>
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<tr>
<td>10:25 - 11:40</td>
<td>B. Keynote Session</td>
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<tr>
<td></td>
<td>Session Chair: Dr. Bessie Burgos, SEARCA</td>
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<tr>
<td></td>
<td>Rapporteur: Ms. Sahlee B. Barrer, Communications Consultant, ACB</td>
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<tr>
<td></td>
<td>i. Linking agrobiodiversity with food systems and nutrition</td>
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<tr>
<td></td>
<td>Dr. Stefan de Haan</td>
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<tr>
<td></td>
<td>Program Management Officer - Asia</td>
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<td></td>
<td>International Center for Tropical Agriculture (CIAT), Vietnam</td>
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<td>ii. Mainstreaming agricultural biodiversity:</td>
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<tr>
<td></td>
<td>Dr. Danny Hunter</td>
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<tr>
<td>Time</td>
<td>Session/Activity</td>
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<td>11:40 – 12:10</td>
<td><strong>B. Presentation of the Country Status of Agrobiodiversity in the ASEAN</strong></td>
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<tr>
<td>12:10 – 13:30</td>
<td><strong>Lunch Break</strong></td>
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<tr>
<td>13:30 – 14:30</td>
<td><strong>Session 1: Governance, policies and relevant legal instruments on agrobiodiversity</strong></td>
</tr>
</tbody>
</table>

**Chair:** Dr. Filiberto A. Polisso, Jr., Programme Specialist for Conservation Policy & Research, ACB  
**Rapporteur:** Ms. Claudia Binondo, Project Development Officer, ACB  

<table>
<thead>
<tr>
<th>i.</th>
<th>Developing policies or legal frameworks for the conservation of rural landscapes or agro-ecological areas in a fast-growing economy in Malaysia</th>
</tr>
</thead>
</table>
|    | Dr. Rosliza Binti Jajuli  
|    | Senior Scientist, Center of Agrobiodiversity and Environment Research, Malaysia |

| ii. | Integration of conservation of plant genetic diversity with landscape-level planning and decentralized government programming: Experience and lessons learned from “The Rice Roots Legacy” |
|     | Dr. Lorna E. Sister  
<p>|     | University Researcher, Institute of Crop Science, College of Agriculture and Food Science, University of the Philippines Los Baños (UPLB) Philippines |</p>
<table>
<thead>
<tr>
<th>14:30 – 15:45</th>
<th>Session 2: Conservation and Sustainable Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair: Dr. Buncha Chinnasri, Assistant to the President, Kasetsart University</td>
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</tr>
<tr>
<td>Rapporteur: Ms. Corazon De Jesus, Jr., Programme Specialist, ACB</td>
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</tr>
<tr>
<td>iii. Policy and management response options on the values of pollination and pollinators for food production</td>
<td>Ms. Clarissa C. Arida</td>
</tr>
<tr>
<td>Director, Programme Development and Implementation, ACB</td>
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</tr>
<tr>
<td>i. Trees on farms for ecosystem services, food security, and climate change adaptation</td>
<td>Dr. Anja Gassner</td>
</tr>
<tr>
<td>Head, Research Methods Group, World Agroforestry Center (ICRAF), Philippines</td>
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<tr>
<td>ii. Seeking alternative agricultural livelihoods from forest resource use by local people under the legal land and suppression: A case of Bukit Baisan Selatan National Park in Indonesia</td>
<td>Dr. Kazuhiro Harada</td>
</tr>
<tr>
<td>Professor, Graduate School of Bioagricultural Sciences</td>
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<tr>
<td>Division of Regional Resources Management, Laboratory of Forest Resources Utilization, Nagoya University, Japan</td>
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<tr>
<td>iv. Sustainable practices and management of natural resources through biodiversity-based products in Hoang Lien National Park (an ASEAN Heritage Park) in Vietnam</td>
<td>Dr. Pham Anh Cuong</td>
</tr>
<tr>
<td>Director, Biodiversity Conservation Agency (BCA), Vietnam</td>
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<tr>
<td>Environment Administration, Ministry of Natural Resources and Environment, Vietnam</td>
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</tr>
<tr>
<td>iv. Scientific innovations and research on agrobiodiversity</td>
<td>Dr. Siriwat Wongsiri</td>
</tr>
<tr>
<td>Professor, Graduate School, Maejo University, Thailand</td>
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| 15:45 – 16:00 | Afternoon Break |

<p>| 16:00 – 17:15 | Session 3: Gender and Social Contexts |
| Chair: Dr. Pattara Chompuming, Professor, School of Administrative Studies, MUU |
| Rapporteur: Ms. Carmen Nyhria G. Rogel, Program Specialist, R&amp;D, SEARCA |</p>
<table>
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<th>Time</th>
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| i. Integrating agrobiodiversity into local development programmes and related initiatives for building capacities of communities and government | Mr. Michael Victor  
CTA/Team Leader – Knowledge Management and Policy Dialogue,  
The Agrobiodiversity Initiative (TABI) |
| ii. Promotion of traditional ecological knowledge and sustainable use of non-forestry forest resources or biodiversity-based products for sustainable forest management and food security | Atty. Edna N. Maguigad  
Regional Policy Advisor  
Non-Timber Forest Products Exchange Program (NTFP-EP) Asia |
| v. Linking and Learning with Agrobiodiversity Communities on the Ground | Dr. Maria Celeste H. Cadiz  
Program Head for Knowledge Management, SEARCA |
| vi. The crucial link between gender, capacity-building, and the local knowledge systems and its relevance to sustainable development | Ms. Deepa Ravindran  
Programme Coordinator  
Pesticide Action Network Asia Pacific |
| 17:15 – 17:30 | Reflections for the Day  
Dr. Bessie M. Burgos  
Dr. Wayne Nelles |
| 19:00 onwards | Welcome Dinner  
Hosted by Maejo University |

**Day 2, 13 September 2017 (Wednesday)**

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<th>Time</th>
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| 09:00 – 09:45 | Mapping of opportunities for strategic cooperation on agrobiodiversity in Southeast Asia vis-à-vis the relevant global and regional frameworks and targets on sustainable development, biodiversity conservation, food security, and climate change resilience  
Moderator:  
Ms. Carmen Nyhria G. Rogel SEARCA |
<p>| i. Introduction of the objectives, mechanics and expected outputs of the session | Ms. Carmen Nyhria G. Rogel |
| ii. Presentation of partners on agrobiodiversity-related initiatives and possible areas of collaboration | Selected partners |</p>
<table>
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<th>Time</th>
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<tbody>
<tr>
<td>09:45 - 10:00</td>
<td>Morning Break and Photo Opportunity</td>
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<tr>
<td>10:00 - 10:10</td>
<td>iii. Framework setting for the break-out discussion</td>
<td>Dr. Filiberto A. Pollisco, Jr.</td>
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</table>
| 10:10 - 12:00 | iv. Discussion by break-out groups (key elements of PoW on Agrobiodiversity):  
|             | a. Assessment                                                         |                                                                              |
|             | b. Innovations and best practices                                     |                                                                              |
|             | c. Capacity building                                                  |                                                                              |
|             | d. Mainstreaming                                                      |                                                                              |
| 12:00 - 13:00 | Lunch Break                                                           |                                                                              |
| 13:00 - 14:30 | v. Presentation of group discussions through “Bus Stop”                | Group Chairs                                                                 |
| 14:30 - 15:00 | Afternoon Break                                                        |                                                                              |
| 15:00 - 15:30 | vi. Ways forward and recommendations                                  | Dr. Percy E. Sajise  
|             |                                                                     | Dr. Wayne Nelles  
|             |                                                                     | Ms. Clarissa Arida  
|             |                                                                     | Dr. Bessie Burgos |
| 15:30 - 16:00 | vii. Closing remarks                                                  | Dr. Gil C. Saguguit, Jr.  
|             |                                                                     | Director, SEARCA  
|             |                                                                     | Ms. Clarissa C. Arida  
|             |                                                                     | Director, Programme Development and Implementation Unit, ACB  
|             |                                                                     | Dr. Weerapon Thongma  
|             |                                                                     | Vice President for Student Development and Alumni Relations, MU |
|             | **Evening: FREE**                                                     |                                                                              |
| **Day 3, 14 September 2017 (Thursday)** |                                                                              |                                                                              |
| 09:00 - 15:00 | Field Visit to Queen Sirikit Botanic Garden                           | All interested participants                                                  |

**Workshop Venue:** International Education and Training Center, Maejo University  
Bang Khen Alley, Tambon Nong Han, Amphoe San Sai, Chang Wat Chiang Mai 50290, Thailand  
Phone: +66 53 873 000
Annex 2. Resource speakers and their affiliation

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Honorary Research Fellow, Bioversity International  
Member, Advisory Group to the Secretariat of the Commission on Genetic Resources for Food and Agriculture of the United Nations  
Adjunct Professor, School of Environmental Science and Management, University of the Philippines Los Baños  
Senior Fellow, SEARCA

**Dr. Chamnian Yosraj**  
President  
Maejo University

**Atty. Roberto V. Oliva**  
Executive Director  
ASEAN Centre for Biodiversity
Mr. Xavier Canton-Lamousse  
Project Manager, Operations Section  
Delegation of the European Union to the Philippines

Ms. Clarissa C. Arida  
Director, Programme Development and Implementation  
ASEAN Centre for Biodiversity

Dr. Stefan de Haan  
Program Management Officer - Asia  
International Center for Tropical Agriculture (CIAT), Viet Nam
Dr. Danny Hunter
Senior Scientist, Healthy Diets for Sustainable Food Systems
Global Project Coordinator, Biodiversity for Food and Nutrition (BFN)
Bioversity International, Rome, Italy

Mr. Doley Tshering
Regional Technical Specialist
UNDP Bangkok Regional Hub

Dr. Bernadette Resurreccion
Senior Research Fellow
Stockholm Environment Institute, Asia Center
Dr. Wayne Nelles
Visiting Scholar, Chulalongkorn University and Technical Coordinator, Regional Workshop on Agrobiodiversity

Dr. Rosliza Binti Jajuli
Senior Scientist, Center of Agrobiodiversity and Environment Research, Malaysia

Dr. Lorna E. Sister
University Researcher, Institute of Crop Science, College of Agriculture and Food Science, University of the Philippines Los Baños (UPLB) Philippines
Dr. Anja Gassner  
Head, Research Methods Group, World Agroforestry Center (ICRAF), Philippines

Dr. Kazuhiro Harada  
Professor, Graduate School of Bioagricultural Sciences  
Division of Regional Resources Management, Laboratory of Forest Resources Utilization, Nagoya University, Japan

Dr. Pham Anh Cuong  
Director, Biodiversity Conservation Agency (BCA), Vietnam Environment Administration, Ministry of Natural Resources and Environment, Viet Nam
Dr. Siriwat Wongsiri
Professor, Graduate School, Maejo University, Thailand

Mr. Michael Victor
CTA/Team Leader – Knowledge Management and Policy Dialogue
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Program Head for Knowledge Management
Southeast Asian Regional Center for Graduate Study and Research in Agriculture

Ms. Deeppa Ravindran
Programme Coordinator
Pesticide Action Network Asia Pacific

Dr. Weerapon Thongma
Vice President for Student Development and Alumni Relations
Maejo University
Dr. Gil C. Saguiguit, Jr.
Director
Southeast Asian Regional Center for Graduate Study and Research in Agriculture
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Regional Workshop on Agrobiodiversity  
12-14 September 2017, Maejo University, Chiang Mai, Thailand

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Annex 4. Slide presentations
Dr. Percy Sajise - Keynote Presentation
Outline

1. Introduction – Biodiversity and Agrobiodiversity Linkages and Importance
2. Biodiversity and the ASEAN Vision of Sustainable Development
3. Status and Capacity of Achieving ASEAN Biodiversity and Agrobiodiversity Conservation and Sustainable Use Targets
4. Opportunities and Challenges in Biodiversity and Agrobiodiversity Conservation and Sustainable Use in the Region
5. Ways Forward
6. Basic References
What is biodiversity and why is it important?

- **Biodiversity** – the variability among living organisms from all sources including among other things, terrestrial, marine and other aquatic ecosystems and the ecological complexes which they are part; includes diversity of species and ecosystems (CBD); **agrobiodiversity** if human-modified.

- **Functional biodiversity** – the type of biodiversity that provides more available options for livelihoods of the social system while at the same time maintaining ecosystem services of the natural resource base or a transformed natural system to enhance sustainability.

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Agrobiodiversity is a sub-set and central to overall biodiversity; there is the need and a natural link between them.

- Mixed agro-ecosystem
- Crop species/varieties
- Livestock and fish species
- Plant/animal germplasm
- Soil organisms in cultivated areas
- Biocontrol agents from crop/livestock pests
- Wild species as landraces or with breeding
- Cultural and local knowledge of diversity

[Source: L. A. Thrupp 1997]
• Biodiversity and particularly Agrobiodiversity is not just about the number of species or adding more species. It is “good biodiversity” if:
  – It is a functional diversity governed by homeostatic and well-ordered relationships among component species at all levels – genetic, species, communities, ecosystems and landscape
  – It is managed by traditional knowledge or knowledge systems based on these positive relationships
  – It is biodiversity of a natural resource base which is positively interacting with technology and the socio-cultural elements of the ecosystem

Figure 1. Conceptual model of the relationship between biodiversity and sustainable development
• Biodiversity interpreted as simply increasing the numbers and kinds of species of living organisms does not always lead to Sustainable Development

• The case of the Golden Snail in the Philippines and other Southeast Asian countries

• The case of Padi Angin

Good Agrobiodiversity in Natural Biodiversity – Cardamon undergrowth in midmontane forest of Shri Lanka; Coffee under Pine trees, Alder, or Dipterocarps in some regions of the Philippines
Why Biodiversity is Important

- **Rio +20 Outcome Document** – reaffirms the multi-value of biodiversity in terms of social, economic, ecological as well as its role as basic foundation of sustainable development and human well being.
- Biodiversity is linked and underpins **productivity** and **resilience** of ecosystems.
- It can serve as **buffer for climate change** as well as being affected by climate change.
- **Basic foundation** of food security, human health and ecosystem services.
- **A basic element** of sustainable development.
Biodiversity Conservation and Sustainable Use
Underpins Processes and Multifunctionalities

- Food Security, Nutrition and Human Health
- Sustainable Livelihoods
- Poverty Reduction/Eradication
- Resilience of Agricultural Systems and Communities
- Ecosystem Services- clean water, pollination, pest management, healthy soil and cultural values
- Sustainable Agriculture and Landscapes
Figure: Conceptual model of the multi-functional aspects of agroecosystems

External Factors or Other Linked Agroecosystems
- Market
- Climate Change
- Policy
- Social Conflicts
- Natural Upheavals (earthquakes, volcanic eruption, etc)

Drivers/Inputs
- Biodiversity
- Soil
- Climate
- Bio-geochemical inputs
- others

Natural: Agroecosystem(s)

Natural: Human Society

On Site & Offsite (Outputs)
- Climate
- Herbivory
- Pollinations
- Soil Erosion
- Water
- Purification
- Natural hazard
- Seed dispersal & regeneration

Cultural Services
- Spiritual & religious values
- Knowledge Systems
- Education & inspiration
- Sense of Place
- Recreation and Aesthetic

Production Services
- Food, Fiber, Fuel
- Genetic Resources
- Agrobiodiversity
- Biochemicals
- Freshwater
- Clean Air

Ecosystem Services
- Primary Production
- Provision of Habitat
- Nutrient Cycling
- Soil formation & retention
- Water cycling
- Geo-chemical cycles
- Energy storage & flow
- Pest & diseases
- Regulation

Drivers/Inputs
- Technological: machineries, chemicals, cultural practices, water supply, processing etc.
- Socio-economic-political
- Beliefs & practices, knowledge system, organization, policies, markets, credit capacity building, others

Regional Workshop on Mainstreaming Biodiversity in Agriculture for Sustainable Development and Food Security in Southeast Asia: International Education and Training Center, Mahidol University, Chiang Mai, Thailand | 11-14 September 2017

"Biodiversity is the heart of sustainable agricultural systems"

GEF
Biodiversity, however, means different things for various kinds of stakeholders which makes all biodiversity decisions including those based on science value-laden. The legitimacy of stakeholder’s claim will always be debatable with political and economic power dynamics providing the major influence in making decisions on access, use and benefit-sharing on biodiversity.

Vermuelen, 2004

Biodiversity and the ASEAN Vision of Sustainable Development

- **ASEAN Vision** — “an ASEAN Socio-Cultural Community that is inclusive, sustainable, resilient, dynamic and engages and benefits the people”

- **ASEAN Vision 2020 (ASCC)** — “to achieve a clean and green ASEAN with fully established mechanisms for sustainable development, and ensure that protection of the region’s environment and natural resources are sustained as well as the high quality of life for its people”

- **Nay Pyi Taw Declaration of 12 Nov 2014** — “promote resilience and the green technology”
How to Mainstream Biodiversity and Sustainable Management of Natural Resources in the ASEAN Vision 2025

- Integrating the concerns into national, sub-national and local plans for development
- Translating these priorities into budgetary allocations for research and development among concerned agencies at various hierarchical levels
- Providing the policy enabling environment to sustain and enhance the mainstreaming processes
## Biodiversity and Sustainable Management of Natural Resources

### SDG 2030

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| 12. Sustainable Consumption and Production | B.8; C.5 Sustainable Economic Development (Food, Agriculture and Forestry; Ensuring food security, food safety, better nutrition, increasing resilience to CC) | C.4- Sustainable Consumption and Production  
- Environmental education  
- Green lifestyle  
- Private-Public Partnership | D.3- Enhanced capacities for CC adaptation |
| 13. Climate Action | C.5- Increase resilience to CC, natural disasters and other shocks | | |

### SDG 2030

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| 14. Life Below Water | B.6.2- Maritime cooperation in protection and preservation of marine resources and the protection of biodiversity | C.6; C.9- Tourism, Science and Technology for Environmental Protection and Climate Change | C.1- Conservation and Sustainable Management of Biodiversity and Natural Resources:  
- Coastal and Marine resources  
- Wetlands and peatlands  
- Promote role of ACB  
- Support Aichi Targets  
- Regional and global partnership |
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| 17. Life on Land | B.3.1- Strengthen cooperation in addressing and combating transnational crimes (wildlife, timber) | B.8- Sustainable economic development (good agricultural practices, forest management) | C.1.- Conservation and management of biodiversity and natural resources:  
  - Policy  
  - Capacity building  
  - Education  
  - Promote role of ACB  
  - Aichi Targets |
|          |                      |                   |                   |

Biodiversity and Sustainable Management of Natural Resources

Regional Workshop on Maintaining Biodiversity in Agriculture for Sustainable Development and Food Security in Southeast Asia  
International Education and Training Center, Moam University, Chiang Mai, Thailand  
13-14 September 2017

68
ASEAN Bodies Identified for the Blueprint
Actions on Biodiversity and Sustainable
Management of Natural Resources

- ASOEN- ASEAN Senior Officials on Environment
- ACB- ASEAN Center on Biodiversity
- ASC- ASEAN Standing Committees
- SOM-AMAF- Senior Officials of Ministry of Agriculture and Forestry
- SOM-HD- Senior Officials Meeting on Health Development
- SOM-ED– Senior Officials Meeting on Education
- COST- Committee on Science and Technology

SEAMEO CENTERS with MANDATE
on BIODIVERSITY and SUSTAINABLE
MANAGEMENT of NATURAL RESOURCES

SEARCA, BIOTROP and Other SEAMEO Centers
with Related Activities such as Education,
Science, Policy and Capacity Building in General
BUT NEED to WORK with OFFICIALLY
DESIGNATED ASEAN BODIES
Biodiversity in the ASEAN

- AMS occupy only 3% of the earth’s surface but can account for 20% of all known plant, animal and marine species; a large number of endemic species;
- Indonesia, Philippines and Malaysia constitute 3 of 17 megabiodiversity countries in the world; and
- The region is the center of diversity of many major crop species, e.g. rice, mango and others as well as numerous medicinal plants and the TK associated with these materials.

Status and Capacity of Achieving ASEAN Biodiversity Conservation and Sustainable Use Targets (Biodiversity Outlook, 2010)

Biodiversity situation in ASEAN is a concern:

- Loss of 555,587 square km of forests within the period 1980-2007
- Decline of mangroves by 26% within the period 1994-2008
- Highest loss of coral reefs by 40% between 1994-2008
- Significant loss of seagrass especially for Indonesia, Philippines, Singapore and Thailand
- Increase in invasive and alien species which displace native biodiversity
Reasons for rapid loss of biodiversity in the region

1. Poverty
2. Rapid modernization of agriculture favoring monoculture
3. Changing consumer tastes
4. Rapid urban population increase
5. Ageing rural population and the youth not going back to traditional farming
6. Infrastructure development
7. Changing land use and destruction of habitat/ecosystems, i.e. plantation establishments and Fire
8. Frequent occurrence of disasters/climate change

Increasing demand for agriculture can only be met if we continue to have access to genetic diversity of crops and their wild relatives that will provide breeders and farmers with raw materials required to sustain and improve their crops.
Regional Biodiversity Status: The National Biodiversity Strategy and Action Plan (NBSAP) and The Aichi Targets in Support of CBD Goals

- Designation of Protected Areas (Terrestrial) Targets achieved; need to improve management
- Conservation of species diversity initiated but not sufficient
- Not much effort in conservation of genetic resources (trees, fish, livestock and wildlife)
- Certification for forest and fishery products started but not widespread; efforts to negate consumption patterns which are inimical to biodiversity is slow

Regional Status of CBD Goals (continued)

- Region, in general, faces serious problems in reducing rate of habitat loss
- Efforts to control threats from invasive and alien species in early stages
- AMS are fully cognizant of the importance of climate change and pollution impacts on biodiversity and have initiated programs to address this concern
Regional Status of CBD Goals (continued)

- Efforts to maintain capacity of ecosystems to deliver goods and services and support of livelihoods and food and nutrition security are well recognized among AMS; programs to address this concern incorporates **strong community-based approaches**
- AMS are taking action to protect IK/TK; specific laws to recognize rights of IPs are being put in place as well as including them in decision-making
- ABS following national guidelines based on the Protocol and ITPGRFA are in place in some AMS but not in others
- Access to technology continues to be a key challenge for many AMS

REGIONAL AGROBIODIVERSITY STATUS ASSESSED BASED ON THE GLOBAL PLAN OF ACTION (GPA)
Agrobiodiversity Shaped by the Exchanges and Sharing of Plant Genetic Resources

Biodiversity and its elements: from "Common Heritage" to National Sovereignty

Rationale for Germplasm Exchange

- No one country possesses sufficient plant genetic materials within its borders to meet all its present and future needs.
- Species of plants do not respect country boundaries.
- Agricultural crops germplasm are already mostly distributed worldwide.

Some Examples:
- Taro leaf blight case in Western Samoa
- African Oil Palm widely grown in Malaysia has its origin in West Africa
- Coconut and banana widely grown in Africa and America but originated in Asia and Pacific
New varieties: rice

*“Borrowed”*/Total

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The International Treaty on PGRFA


- Legally binding, it establishes the framework for access and benefit sharing within a multi-lateral system for most of the world’s major food crops.

- Includes 35 genera of food crops and 29 forage species including all major CGIAR crops and a number of minor ones.

- Identified food and forage crops in the Multilateral System (MLS) to be exchanged using a Standard Material Transfer Agreement (SMTA).

- MLS provides uniform condition for ABS; reduce transaction costs for users; streamlined conditions.
In Situ (in place) Conservation and Development

Common Gaps:
1. Insufficient number of staff and weak technical capacity
2. Lack of or insufficient funding
3. Lack of incentives for people to participate in on-farm or protected area conservation/protection
4. Lack of or weak coordination of activities (identified in SOW – 2)

Needs

- Documentation of knowledge associated with PGRFA
- Enhanced networking/partnership/stakeholder participation
- Public awareness
• Need to conduct surveys and inventory, especially of CWR (Protected Areas, remote, inaccessible and “disturbed” areas) is a priority;
• Restoration of homegardens as a form of on-farm conservation;
• Integration of in situ conservation into school curricula; and
• Greater sectoral integration of formal government sectors of forestry, agriculture and environment for in situ conservation

Ex Situ (Out from the Place) Conservation

Significant progress made in this area but varying technical and infrastructure levels of development in the region reflected in varying capacities of AMS
Needs

- Common need expressed by several countries is in strengthened and focused collecting activities with greater attention to CWR and UUCs
- Need for a more coordinated planning and policy development on PGRFA at the national level
- Interdisciplinary teams to pursue PGRFA activities
- Upgrading of facilities especially in terms of lack of a reliable power supply
- Identification of duplicates and improved regeneration protocols

Utilization of PGRFA

- Common gap identified was on evaluation and documentation of PGR and the need to link PGRFA genebanks and users (identified in SOW – 2)
- Weak human resource capacity especially in the use of molecular tools in characterization, evaluation and establishment of core collections
- Common need: better understanding of seed systems, policy development and attention to core collection (identified in SOW – 2)
Increasing genetic enhancement and base-broadening efforts – many good examples in the region to demonstrate its importance and relevance: homegardens in Indonesia, Viet Nam and Thailand; Participatory Plant Breeding in the Philippines, Vietnam and other AMS

Constraints for agrobiodiversity conservation and sustainable use - subsidy for big commercial farms and the market favoring products of monoculture

Institutions and Capacity Building

- National Information Sharing Mechanism (NISM) – 61 countries with NISM and a third of them is in the region
- Importance of NISM
  1. Development of a national strategy on PGRFA conservation and sustainable use
  2. Identify and share institutional or SH responsibilities
  3. Create/raise awareness on importance of PGRFA
  4. Promote research and action on identified gaps
  5. Draw long term financing for PGRFA conservation and sustainable use

Need to develop regional NISM
There are opportunities existing in the region for human capacity building in PGRFA – formal degree programs and short term trainings

Main constraints: lack of financial support and shortage of human resources

Opportunities in Biodiversity Conservation and Sustainable Use in the Region

- Institutions and Networks on Biodiversity and PGR- ACB, RECSEA-PGR, Crop Networks, ASEAN Official Bodies and the Blueprint of the three Pillars
- National Information Sharing Mechanism for agrobiodiversity is in place
- Education and Training on Biodiversity Conservation available in Universities in the Region
- Research Consortium on Climate Change is in place in several AMS
- New Approaches to enhance Biodiversity Conservation have been initiated, e.g. GIAHS
Current Issues and Concerns in the Sustainable Conservation and Use of Agrobiodiversity

Technical Issues:
• What kind of agrobiodiversity needs to be conserved: better understanding of system and components and their relationships;
• Genetic erosion, rationalization of collections especially of wild relatives
• Valuation of agrobiodiversity: economic, environmental and cultural

Current Issues and Concerns (Cont’n)

Legal Issues
• Access
• Intellectual Property Rights
• Seed Systems
• Markets
• Biosafety
Ways Forward

Start with What is Already In Place

- Documentation of Good Practices in Deploying and Managing Agrobiodiversity in ASEAN

Existing good practices must be documented in terms of what, why, how, where and their impacts for upscaling and wide scaling in the region. Upscaling for developing a policy enabling environment for promoting the conservation and sustainable use of agrobiodiversity and wide scaling for replication in the same eco-socio-cultural typologies in the region.

Ways Forward

- Research on the “hidden values” of agrobiodiversity to balance productivity objectives with sustainability through payments of these “hidden values”
Ways Forward

• Enhancing Values of PAs as food and nutrition baskets and providing ecosystem services as a priority ASEAN agenda; improved funding and management by linking concerned Ministries at national and regional levels; better management of PAs, sustained and properly valued ecosystem services

• Developing a Regional Agrobiodiversity Data Base-Collection and exchanges of biodiversity materials through the Protocol and the ITPGRFA harnessing existing ASEAN Biodiversity and PGR Networks; Enhanced coordination between relevant Ministries at all levels to integrate CBD and the GPA implementation.

Ways Forward

• Promote networking of seedbanks at the community, national and regional levels to better respond to disasters and climate change for food and nutrition security

• Recognition of outstanding biodiversity programs at the community, national and regional levels through ASEAN-incentive for biodiversity conservation (being initiated by ACB)

• Capacity building for farmers, fisherfolks and forest users using effective models and best practices – initiate a regional training center or integrate into existing ones, i.e., Farmers Field School Platform- enhance upscaling of best practices on biodiversity conservation and sustainable use
Ways Forward

- ASEAN provide and promote markets and adding value to UUC for promoting biodiversity at all levels - provide market incentives for conservation and sustainable use of biodiversity
- Developing an ASEAN Consortium on Research for Biodiversity and Climate Change (AC-BCC) using existing platforms of National and Regional Institutions such as ACB, SEARCA and BIOTROP and ASEAN University Network - maximize use of biodiversity for climate change adaptation and mitigation using existing institutions
- Improved inter-pillar coordination in ASEAN especially in terms of complementarity for biodiversity and sustainable natural resource management

Regional Coordinating Body

- Need a strong champion in ASEAN
- Thailand as the next ASEAN Chair is preparing a proposal to establish an ASEAN Sustainable Development Studies Center (ASDSC)
- Proposal - Set Up a Unit/Division under the ASDSC on Agrobiodiversity for Sustainable Development jointly hosted by ACB and SEARCA
- Need for strong lobbying at ASEAN and AMS level through ASOEN and SOM-AMAF
Conclusion

- Even in a rapidly changing and increasingly globalized world, human society needs food, clothing, shelter and medicines;

- Human society will always be dependent on the basic functions and services of ecosystems;

- Indeed, demand for these biodiversity elements and agrobiodiversity in particular is growing as population expand;

- Yet we are losing these precious biological resources in an unprecedented rate;

- But agrobiodiversity is nothing without the ability to use it especially in the context of a food insecure and poverty-ridden society

---

Conclusion con’t

- A food secure and healthy future for human society will require not only that the world’s agrobiodiversity heritage is accessible to all but all will have an ability to use and benefit from it;

and a fair and transparent system for sharing both the resources and benefits arising from their use will move us closer to this goal.
“Biodiversity is the heart of sustainable agricultural systems” — GEF

“Biodiversity is the life insurance of LIFE itself” — McNeill and Shei

“Biodiversity which is the library of LIFE is on fire and we must put it out” — Gro Harlem Bruntland

FOR A BRIGHT AND PROSPEROUS FUTURE, WE CAN ALL BE CHAMPIONS FOR THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY PARTICULARLY AGROBIODIVERSITY

Basic References


• Thailand’s Revised Information Paper/Matrix: Compilation of Possible Complementarities between The ASEAN Community Blueprint 2025 and the 2030 Agenda for Sustainable Development. 12 August 2016.
Mainstreaming Biodiversity in Agriculture for Sustainable Development and Food Security in Southeast Asia

Regional Workshop on Agrobiodiversity
12-14 September 2017
Mahidol University
Chiang Mai, Thailand

Biodiversity and Agriculture
1. Importance of biodiversity to food security and nutrition and its role in human health and well-being, including through the production of food, fibres, biofuels, and medicinal plant agriculture depends on biodiversity, as well as on the ecosystem functions and services that it underpins (fertile soil, clean water, etc.)
2. We need to address unsustainable agricultural practices that can have significant impacts on biodiversity

“Mainstreaming Biodiversity in Agriculture for Sustainable Development and Food Security in Southeast Asia”

Workshop Overview
2030 Agenda for Sustainable Development (SDGs)

Goal 2: to end hunger, achieve food security, and improved nutrition and promote sustainable agriculture

SDG 2 and 5,

Target 4 Ensure sustainable food production systems, and implement resilient agricultural practices

Target 5 maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species

GBO4
address the pressures on biodiversity resulting from food systems

ABO2
Outline

Chapter 1. Progress in ASEAN’s Efforts towards achieving the Aichi Targets: SNRs, Aichi Traffic Lights

Chapter 2. ASEAN Biodiversity in a Changing Environment
2A: State of Ecosystems
2B: Cross cutting concerns

Chapter 3. Enhancing implementation: ASEAN’s priority actions to achieve the Aichi Targets

Chapter 4. The ASEAN Biodiversity Outlook: 2020 and Beyond

ASEAN BIODIVERSITY OUTLOOK 2
Agro-biodiversity

(Convention on Biological Diversity
Programme of Work on Agrobiodiversity
CBD COP 5 Decision VI/5)

- To promote the positive effects and mitigate the negative impacts of agricultural systems and practices on biological diversity in agro-ecosystems and their interface with other ecosystems
- To promote the conservation and sustainable use of genetic resources of actual and potential value for food and agriculture;
- To promote the fair and equitable sharing of benefits arising out of the use of genetic resources.

Workshop Overview
Agrobiodiversity
(CONVENTION ON BIOLOGICAL DIVERSITY
Programme of Work on Agrobiodiversity
CBD COP 5 Decision V/5)

Programme Elements

1. Assessments: To provide a comprehensive analysis of status and trends of the world’s agricultural biodiversity and of their underlying causes (including a focus on the goods and services agricultural biodiversity provides), as well of local knowledge of its management.

2. Adaptive management - To identify management practices, technologies and policies that promote the positive and mitigate the negative impacts of agriculture on biodiversity.

3. Capacity Building: To strengthen the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage sustainably agricultural biodiversity.

4. Mainstreaming: To support the development of national plans or strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration in sectoral and cross-sectoral plans and programmes.
Objectives

- to discuss and share about the status and trends, including underlying causes of change and cross-cutting issues, and the knowledge of management and conservation practices in the region.
- to take stock of the initiatives in Southeast Asia in support of the CBD's agenda on agrobiodiversity and mainstreaming biodiversity into the agriculture sector.

Objectives

- sharing reports on trends, and issues on agrobiodiversity, both globally and in Southeast Asia.
- understand agrobiodiversity, its concept, related processes, and cross-cutting concerns;
- facilitate the exchange of knowledge, lessons learned, best practices, and innovative ideas towards the conservation and sustainable use of agrobiodiversity.
- identify and recommend mechanisms and platforms to strengthen cooperation for an effective response to address biodiversity loss arising from agriculture and food systems.
Expected Output

- Identify or map opportunities for strategic cooperation on agrobiodiversity viz the relevant global and regional frameworks and targets on sustainable development, biodiversity conservation, food security, and climate change resilience.

- Identify elements of a proposed Action Plan on Agrobiodiversity in Southeast Asia (ASEAN Action Plan on Agrobiodiversity)

SEARCA – ACB Partnership

MoU of ACB and SEARCA for 3 years was signed on 1 July 2016

The partnership serves as a relevant response to enhance the regional cooperation for research, knowledge management, and graduate education in biodiversity and agriculture.
Partners, Stakeholders, Donors

- ASEAN Members States
- SEARCA
- ACB
- (MoU between ACB and SEARCA)
- EU (BCAMP Project with ACB)
- Maejo University
- Nagoya University
- CGIAR Centers (International Center for Tropical Agriculture/CIAT, Biodiversity International, World Agroforestry Center/ICRAF)
- UN Agencies (UNDP, UNEP, FAO, etc.)
- Academe
- Research Institutions
- NGOs
- International Organizations
- Bilateral and Multilateral partners
Overall Objective
Supported global sustainability by ensuring ASEAN's rich biological diversity is conserved and sustainably managed toward enhancing social, economic, and environmental well-being.

Specific Objective
Enhanced conservation of biodiversity and effective management of protected areas in Southeast Asia to halt or significantly reduce biodiversity loss.

Component 1
Site
Output 1
Improved effectiveness of biodiversity conservation and PA management

Component 2
Enabling National Supports
Output 2
Developed and mobilized knowledge and scientific basis for biodiversity conservation

Component 3
Regional
Output 3
Mainstreamed biodiversity conservation into development plan and education system

Output 4
Strengthened capacity of ACB to support regional agenda and ANS

Programme (2 days)
- Plenary Keynote Presentations:
  Mainstreaming Biodiversity in Agriculture for Sustainable Development and Food and Agriculture
- 3 Plenary Sessions
  Session 1: Governance, policies and relevant legal instruments on agrobiodiversity
  Session 2: Conservation and Sustainable Use
  Session 3: Gender and Social Contexts
- Mapping opportunities and regional cooperation (Sharing of Initiative from Academe, Research Institutions, NGOs)
- Workshop (Breakout Groups) – Identify elements of the Action Plan on Biodiversity in Southeast Asia
- 4 Groups: Assessments, Innovations, Capacity Building and Mainstreaming)
Thank you!
REGIONAL WORKSHOP ON
AGROBIODIVERSITY
12-14 September 2017
Maejo University, Chiang Mai, Thailand

“Mainstreaming Biodiversity in Agriculture for Sustainable Development and Food Security in Southeast Asia”
Workshop Overview

Claesja Arda
Director, Programme Development and Implementation
ASEAN Centre for Biodiversity
Dr. Stefan de Haan - Linking agrobiodiversity with food systems and nutrition

What are the challenges?

• How can huge populations be fed healthily, equitably and affordably while maintaining the ecosystems on which life depends? The evidence of diet’s impact on public health and the environment has grown in recent decades, yet changing food supply, consumer habits and economic aspirations proves hard (Mason and Lang, 2017)

• There is still a lack of data linking biodiversity to dietary diversity and improved nutrition outcomes, as well as few practical examples on how to successfully mainstream biodiversity for nutrition objectives (Fanzo et al, 2013)
About ABD, SFS and Nutrition

Micro to Macro: bridging scales

Spatial

Temporal

Macro

Micro to Macro: bridging scales

Policy relevance
Priority setting
Regional trends
< resolution
> scale

Ongoing evolution
Loss + enrichment
Mutualism
> Resolution
< scale
Ethnicity, Intensification, Agroecology and Rice Landrace Conservation

Distribution of potato landraces Peru (two points in time)
2. Participatory mapping (period 2010-2014)
In-situ conservation: different paradigms

Science-driven conservation:
- Projects (Universities, ARSs)
- Aimed at understanding processes

Research components:
- Genetic diversity
- Gap analyses
- Ecosystem services
- Temporal & spatial comparisons
- Monitoring metrics
- Etc.

Farmer-driven conservation:
- What farmers do
- Historical phenomenon
- Embedded within livelihood strategies

Role:
- Food security & diversity
- Prestige and social value
- Income generation
- Pleasure & satisfaction
- Etc.

Action-driven conservation:
- Projects (NGO’s, ARSs)
- Aimed at support for conservation

Action components:
- PES / ABS schemes
- Park systems
- Seed fair
- Market linkages
- Etc.

Ex-situ conservation:
- Genebanks
- Botanical gardens
- In-vitro, cryopreservation, cold store, ...
- Etc.

THE FOOD SYSTEM
DRIVERS - ACTIVITIES - ACTORS - OUTCOMES

www.ciat.cgiar.org
About ABD, SFS and Nutrition

CIAT and the SDGs – environmental, social, and economic welfare for all

Reflections at 5 levels

Drivers of food system change

Food supply systems

Food environment

Consumer

Diets

Ag production

Food storage, transport and trade

Food retail & provisioning

Food processing
(1) ABD and diet quality

Retention of Fe & Zn after boiling; No significant changes after boiling

Boiled mixed native cultivars

Nutritional Value of Black & White Chuño

Zn ↓

Ca ↑

Fe ↔

Economic Botany 84(3):217-234
Traditional treasures: diet diversity

Recommended nutrient intakes and % per 100 g of:

<table>
<thead>
<tr>
<th></th>
<th>Protein</th>
<th>Vitamin A</th>
<th>Iron</th>
<th>Folate</th>
<th>Zinc</th>
<th>Calcium</th>
<th>Vitamin E</th>
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<tbody>
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<td>RNI for pregnant women (1st trimester)</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td>percentage of RNI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rice</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>cassava (root)</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>millet</td>
<td>6</td>
<td>0</td>
<td>2</td>
<td>14</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>meat (chicken)</td>
<td>37</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>14</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>mungbean</td>
<td>40</td>
<td>2</td>
<td>22</td>
<td>104</td>
<td>24</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>vegetable soybean</td>
<td>10</td>
<td>2</td>
<td>13</td>
<td>20</td>
<td>13</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>cabbage</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>tomato</td>
<td>2</td>
<td>19</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>slippery cabbage</td>
<td>6</td>
<td>104</td>
<td>5</td>
<td>30-177</td>
<td>11</td>
<td>18</td>
<td>59</td>
</tr>
<tr>
<td>moringa leaves</td>
<td>7</td>
<td>146</td>
<td>11</td>
<td>40</td>
<td>5</td>
<td>10</td>
<td>55</td>
</tr>
<tr>
<td>amaranth</td>
<td>9</td>
<td>160</td>
<td>6</td>
<td>31</td>
<td>6</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>jute mallow</td>
<td>10</td>
<td>198</td>
<td>12</td>
<td>21</td>
<td>0</td>
<td>36</td>
<td>30</td>
</tr>
<tr>
<td>nightshade</td>
<td>8</td>
<td>101</td>
<td>13</td>
<td>19</td>
<td>9</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>vegetable cowpea leaves</td>
<td>8</td>
<td>193</td>
<td>6</td>
<td>27</td>
<td>3</td>
<td>84</td>
<td>101</td>
</tr>
</tbody>
</table>

(2) ABD and consumption

Assessing Nutritional Diversity of Cropping Systems in African Villages

Nutritious Subsistence Food Systems

Robin D. Graham,1 Rosa M. Wilich,2 David A. Saunders,1 Ivan Ortiz- Monasterio,1 Howard E. Bonan,3 Meredith Benkendorf,4 Estefan de Haan,5 Gabriella Burgos,6 Graham Thiele,7 Reyna Liria,8 Craig A. Meisner,8 Steve E. Bece8 Michael J. Potts,9 Mohinder Kadian,10 Peter R. Hobbs,11 Raj K. Gupta1 and Steve Twomlow3

1 School of Agriculture, Food and Wine, University of Adelaide, South Australia 5061
2 School of Agricultural Sciences, University of Sydney, New South Wales 2085
3 School of Agriculture, Food and Wine, University of Adelaide, South Australia 5061
4 School of Agriculture, Food and Wine, University of Adelaide, South Australia 5061
5 Department of Plant Science, University of Pretoria, Pretoria, South Africa
6 Netherlands Institute for Agriculture and Fisheries, Wageningen, The Netherlands
7 International Maize and Wheat Improvement Center, Mexico City, Mexico
8 International Food Policy Research Institute, Washington, DC 20006
9 International Potato Center, Lima, Peru
10 International Potato Center, Lima, Peru

Diversity helps, but by itself is not enough

% of children covering 80% of recommended intake

Carrying capacity

Coverage

Fig. 1: Children's energy and protein intakes relative to energy and protein requirements for children of the same age and gender. The bars represent the recommended daily allowances for children.
Seasonality and Complementarity of Native, Bred & Freeze-dried Cultivars

24-hour recall data – direct weighing (N=67), women fertile age

(3) ABD and food environment

Comparing species and varietal diversity at wet versus super markets

<table>
<thead>
<tr>
<th>Diversity</th>
<th>Species</th>
<th>Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>193</td>
<td>397</td>
</tr>
<tr>
<td>Wetmarket</td>
<td>170</td>
<td>233</td>
</tr>
<tr>
<td>Supermarket</td>
<td>151</td>
<td>251</td>
</tr>
<tr>
<td>Common in both</td>
<td>120</td>
<td>104</td>
</tr>
<tr>
<td>Unique to wetmarket</td>
<td>103</td>
<td>130</td>
</tr>
<tr>
<td>Unique to supermarket</td>
<td>72</td>
<td>147</td>
</tr>
</tbody>
</table>
(4) ABD and food supply systems

Case: potato landraces Peru

- 10+ years of work in Lima
- Diversity slightly increased
- Yet, less than 0.5% of total diversity
- Markets demand uniformity / cont. supply

Case: NUS in Vietnam

- Weedy amaranth found only with selected sellers in few wet markets
- Foxtail millet common in wetmarkets and rarely in supermarkets
- Weedy amaranth, short VC:
  - Producers → Consumers
  - Producers → Wholesale → Retailers → Consumers
- Foxtail millet, long VC
  - Producers → Local collectors → Wholesalers → Retailers → Consumers

(5) ABD & drivers of food system change

Over the last 50 years, the Philippine diet has changed dramatically, including greater quantities of oils, sugars, alcoholic beverages and animal products, and lesser amounts of vegetables, fruits, and traditional staples.

Absolute change in the Philippines diet from 1963-2015.

http://blog.ciat.cgiar.org/five-surprising-ways-people-s-diets-have-changed-over-the-past-50-years/

Source: Sara Kammlade and Colin K. Khoury
Selected Points for Discussion

- Need to promote in-depth research to unravel links between intraspecific diversity and nutrition outcomes
- Need to understand ‘autochthonous’ foodways and ‘new / novel’ ways to link ABD use to SFS / healthy diets
- Need to document the impact of food system interventions on ABD demand and diets
- Need to conduct monitoring at multiple scales from FS transitions to ABD conservation status

Thank you for your attention
Mainstreaming biodiversity: experiences from the Biodiversity for Food and Nutrition (BFN) initiative, and other GEF projects

Danny Hunter, Senior Scientist, Bioversity International
12th September 2017

Dr Bhuwon Sthapit, (1955 – 2017)
Friend, colleague, mentor
Analysis of mainstreaming biodiversity good practices and lessons learned from 14 projects across 36 countries:

- Creating knowledge and evidence
- Sustainable production practices
- Improved market opportunities
- ABS
- Capacity building & awareness
- Policy and legislation frameworks

MAINSTREAMING BIODIVERSITY IN PRODUCTION LANDSCAPES

Challenge: Global malnutrition

2 billion people suffer from micronutrient deficiencies

795 million people are food insecure

Overweight or obese people increase since ‘80s

Global Nutrition Report 2015

FAO: The State of Food Insecurity in the World 2015

Ng M, Fleming T, Robinson M. et al. 2014
Challenge: shrinking biodiversity

- 391,000 globally identified plant species
- 5,538 crops used for food by humans throughout history
- Rice, maize and wheat currently provide >50% of the world's calories from plants
- 12 crops that together with 5 animal species provide 75% of the world's food today

(Data source: RBG Kew 2016; FAO, 1997)

Food biodiversity-based nutrition interventions

- <5 µg carotenoids
- <8500 µg carotenoids

Biodiversity for Food and Nutrition (BFN)

Turkey
- 31% population overweight
- 43 species of local wild edible plant species

Kenya
- 1/3 of population food insecure
- 20 native leafy vegetables, sorghum, millets, nuts, fruits, livestock

Brazil
- 1 in 3 children aged between 5 & 9 are overweight
- 73 high potential native species

Sri Lanka
- 1 in 3 children aged between 5 & 9 are overweight
- 20 native root & tuber crops, bananas, rice varieties, leafy vegetables & fruits
Brazil is losing food biodiversity

Step 1: Identify Potential and Generate Knowledge

Prioritization and nutritional composition of 75 wild species

“Plants for the Future”
Nutritional potential of native wild plants

<table>
<thead>
<tr>
<th>Vitamin A (mcgRAE/100g)</th>
<th>Papaya</th>
<th>Passion fruit</th>
<th>Carrot</th>
<th>Pitanga</th>
<th>Tucumã</th>
<th>Bunti</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>663</td>
<td>57</td>
<td>59</td>
<td>844</td>
<td>1204</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vitamin C (mg/100g)</th>
<th>Lime</th>
<th>Orange</th>
<th>Tangerine</th>
<th>Cagaita</th>
<th>Mangaba</th>
<th>Camu camu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>38</td>
<td>53</td>
<td>112</td>
<td>126</td>
<td>420</td>
<td>1668</td>
</tr>
</tbody>
</table>

Step 2: Anchor in Public Procurement for Nutrition

School Feeding (PNAE) and Procurement Programme (PAA):

- 30% of produce bought from small-scale producers
- A premium of 30% on sustainably produced organic local foods
- Provision of healthy meals = at least 20% of the nutritional needs during the school year
- >40 million students – future consumers
Step 3: Empower Producers to Put Diversity Back in Food Production Systems

Empowerment based on:

- Providing secure market outlets for diverse foods
- Development of cooperatives for efficient aggregation and broader service delivery
- Resilient production through diversification
- Involvement of marginalized producers, including indigenous communities

Step 4: Increase Awareness of How Biodiversity Contributes to Food and Nutrition

Weekly farmers’ market at the Brasilia Botanical Garden

Cultural gastronomic events - cooking demonstrations and tasting of native and nutritious biodiverse foods

From the Dish to the Podium – Rio Olympics 2016:
Street markets, video about healthy sustainable foods featuring Olympic athletes and chefs as part of parallel Rio nutrition summit
Recipe book

Gastronomic Events - Brasilia

Goal - to publicize and promote the use of native species

More than 3000 people tasting the delights of Brazil’s biodiversity
Publications and policies

Regional foods and habits

Health in School Program
Training materials – Booklets, Videos

BFN Chapter

Step 5: Influence Policy

Public policy signed by Brazilian Ministry of the Environment and Ministry of Social Development and Fight Against Hunger.

The 2016 Ordinance on Sociobiodiversity (largely wild biodiversity) is the first policy to define, support and incentivize nutritionally important native species.
Monitoring purchases of wild plant products

PAA

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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<tbody>
<tr>
<td>Value</td>
<td>5.36%</td>
<td>5.91%</td>
<td>9.37%</td>
<td>10.99%</td>
</tr>
</tbody>
</table>

PNAE

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>0.64%</td>
</tr>
</tbody>
</table>

- Volume of resources currently deployed for the purchase of native wild biodiversity products is only a small fraction of the total expenditure on agricultural products
- Opportunity for expansion

Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition

Mainstreaming Agrobiodiversity in Sustainable Food Systems

Scientific Foundations for an Agrobiodiversity Index
The Agrobiodiversity Index

The challenge: Today’s food systems are failing on both the consumption and production sides:

- Malnutrition is affecting one in three people on the planet.
- Fruit and vegetable production provides only 78% of the world population’s nutritional needs.
- Planetary boundaries are being pushed beyond safe limits – agriculture contributes around 24% of the world’s greenhouse gas emissions and is the single largest user of fresh water on the planet.
- Agricultural supply chains and agribusinesses are encountering operational risks from climate change and face reputational risks from resource intensive production and low nutrition production lines.

The solution: Increase agrobiodiversity in supply chains and land management to transform food and agriculture systems.

What is the Agrobiodiversity Index?

The Agrobiodiversity Index is a consistent, long-term monitoring tool to measure and manage agrobiodiversity across three dimensions: diets, production and genetic resources.

It will help decision-makers – governments, investors, companies, farmers and consumers – ensure that food systems are more diverse and sustainable.

Some food for thought

- Collaborate with Bioversity International on the development and implementation of the Agrobiodiversity Index

- Reporting on ABD to CBD, ABTs, ITPGRFA, CGIAR, SDGs, UNCSN, CFS

- CBD, Agrobiodiversity PoW, and Post 2020 Strategic Plan

- Collaborate on new projects in GEF 7

- Research gaps, challenges, awareness raising, capacity building, policy analysis

- Workshop statement, Monograph – ‘Issues in Agricultural Biodiversity’ series
Thank you

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www.bioversityinternational.org/subscribe

@BioversityInt
Dr. Doley Tshering - Sustainable Agriculture and Biodiversity in the context of the SDGs
Everything must make way for more cocoa. People think more cocoa makes more money. Move aside trees, animals, birds. They must be gone to make room for cocoa. But I have seen over the years that this hurts our land, drinks our water, kills our fellow life and living neighbours.

Agriculture & BD Loss

- 75 billion t of soil lost costing $1.5 trillion annually.
- Intensive animal feeding operations produce 500 million tons of manure = 3 times the total amount of sewage produced by humans globally
- Overgrazing = leading cause of desertification
Largest Driver of Deforestation

Yet, the bedrock of most rural economies

UNDP’s BIODIVERSITY PROGRAMME

- 95 projects addressing issues falling under agriculture and livestock sectors.
- Around 70 of them address biodiversity – agricultural nexus.
UNDP’s Work on Biodiversity and Agriculture

- Sustainable commodities;
- BD mainstreaming in sectors;
- BD mainstreaming in land use and development planning;
- Sustainable production practices;
- Resilience of farming communities;
- Agrobiodiversity Conservation
- Access and Benefit Sharing
- Promote Knowledge Exchange

Green Commodities Programme - GCP

Addresses the major cause of deforestation and biodiversity loss through encouraging sustainable commodity production at national level and connecting global markets with national governments and producers.
Global Drivers Influencing Agricultural Commodities

- Global demand
- Middle class
- Market demand for sustainable product growing but limited
- Domestic Demand where sustainability is not yet important

Producer Country Drivers and Barriers:

- Policies, development plans and fiscal incentives - expansion
- Weak enforcement of PAs and land use plans
- Legal frameworks often not recognizing HCVs
- Insufficient market demand for deforestation free products
- Low productivity and resource degradation
Producer Country Drivers and Barriers

Low productivity is key
Underlying reasons:

• High numbers of smallholders with limited education, inputs, technology
• Weak government extension services perpetuating low productivity
• Limited access of farmers to financial services for investing in new practices

Where GCP Operates

Latin America
- Dominican Republic - Coffee
- Honduras - Cattle
- Costa Rica - Pineapple
- Colombia - Coffee
- Paraguay - Soy, Cotton

Asia
- Cargill - Oil, Rice
- Cargill - Coffee
- Dole - Pineapple
- Nestle - Coffee
- Johnson & Johnson - Health Care
- Tesco - Food
Roles of Private Sector

- Influence - Purchasing power = governments will listen
- Making sustainability a commercial issue.
- Expertise in productivity and supply chain – lead and design interventions
- Efficient, practical, sharp Good complement to other players
- Ensures all interventions are commercially viable and hence sustainable

Four Approaches for Advancing Deforestation-Free Commodities

- Policy & Planning
- National Commodity Platform
- Strengthen extension systems
- Economic incentives
GCP – NATIONAL COMMODITY PLATFORMS
BUILDING CONSENSUS ON A NATIONAL RESPONSE TO UNSUSTAINABLE COMMODITY PRODUCTION

PROGRESS WITH PLATFORM

- National Action Plan officially endorsed in Costa Rica with backing at the highest levels as the President (in 2016)
- 10-year National Action Plan agreed by the Dominican Republic - cocoa platform to be implemented under the leadership of the National Cocoa Commission
- Draft National Action Plan development under way in Indonesia through the National Platform for Sustainable Palm Oil
Comprehensive Approach in Indonesia

- National Platform for Sustainable Palm Oil and three Provincial Platforms
- Strengthen ISPO Certification
- Increase the quantity and quality of extension workers
- Ministry of Environment and Forestry – reform land allocation process (GEF)
- Facilitate land swaps from forest to degraded land

GEF Financed Commodities Programme
Taking Deforestation out of Commodity Supply Chains

Components

Generate responsible demand
Support to production
Enable transactions

GEF Financing - $45 million:
Adaptive Management and Learning
What we need is an Integrated Approach

- Decouple food from deforestation and land degradation
- Protect biodiversity and ecosystems that protect food system – forests that provide water for irrigation and plants for pollinators
- Foster biodiversity to increase resilience
Benefit - sharing

- Premiums from conservation compatible practices
- Market approaches (e.g. value addition)
- Supportive legal and policy environment for benefit sharing
- Improved collective capacities
Agrobiodiversity and its social intersections

- Agrobiodiversity, the variety of living organisms that contribute to food and agriculture, is constructed from the interaction between social relations and historical practices, themselves shaped by multiple relations of power.

- The intersection among gender and social relations, agricultural labor, household decision making, gendered access to resources, migration, government, and political economy has worked to shape agrobiodiversity and knowledge over time.
The Kalanguya of Nueva Vizcaya

- Upland portions of Nueva Vizcaya province, northern Philippines
- Traditional swidden cultivators, hunters and forest gatherers, fishers, and livestock raisers
- Cultivated sweet 4 potato varieties, ginger, 2 dry upland rice varieties
- Witnessed and experienced changes: commercial logging, green revolution rice cultivation, migration, new indices of wealth
Pre-war years, 1900-1941
Commercial logging since 1957

- Provided new clearings for cultivation
- Cash earnings trickled in
- Petty trade through cash
- Male bonding through drinking bouts
- Sweet potato cultivation slowed down, as residents began to purchase lowland rice, and men could no longer care for children while women worked on the fields
- Fields became less fertile
The coming of the green revolution, 1970s

- From the sweet potato staple, residents turned to wet paddy rice agriculture
- They began to practice sedentary farming
- Men became primary farmers
- Only very few women cultivated sweet potatoes
- Women’s labor became secondary, and sweet potatoes declined in stature
- Knowledge of root crop varieties, cultivation, and erosion control technologies in the uplands declined and was lost with women farmers in the 1970s
Conclusions

A historical approach shows us how people negotiate changes, by contextualizing cropping practices, knowledge and environmental practices over time.

Agrobiodiversity lies at the changing nexus of relations between people, resources, environment and wider political economy:
- Decision-making dynamics and relations at different scales;
- Assigning priorities to different activities;
- Allocating resources and benefits; and
- Accessing and controlling resources (e.g. land, water, time, credit, labour).

Women, men, young and old, ethnic and mainstream groups, wealthy and poor, all manage resources for farming or producing food (e.g. knowledge, labour, money, livestock, water, crops, tools, information) but they all have different access to, and control over, these resources. They also give different priorities to managing resources and benefit differently from them.
Dr. Wayne Nelles - Agrobiodiversity Conservation and Sustainable Use in ASEAN Member States (AMS)
OVERVIEW

1. NATIONAL SURVEY DATA (Aug 2017) - Selected Results and Recommendations) FROM SOME (not all) AMS

2. NATIONAL REPORTS & PLANS – Selected Highlights

3. REGIONAL TRENDS (Selected Examples from ABO2 with Common themes/Issues from Survey and AMS Reports

4. ASEAN POLICIES & PLANS for AGROBIODIVERSITY (or lack thereof)

5. CONCLUSIONS (Data/Gaps – Policy, Research and Capacity Development Needs)

1. NATIONAL SURVEY DATA

1. NATIONAL SURVEY DATA (Selected Results) from AMS Respondents

(August 2017)
Survey Background

ACB conducted Survey in August 2017 to collect data from all 10 AMS

Twelve main sets of Survey questions focused on:

1. COORDINATION or REPORTING FUNCTIONS (about AGROBIODIVERSITY)
2. AGROBIODIVERSITY MANAGEMENT and OVERSIGHT
3. REGULAR NATIONAL BUDGET(S)
4. EXTERNAL BUDGETS for AGROBIODIVERSITY PROJECTS
5. SCIENTIFIC DATA (Collection, Management and Analysis)
6. GENETIC RESOURCES, BREEDING PROGRAMS and SEED BANKS
7. HUMAN RESOURCE CAPACITIES
8. AGROBIODIVERSITY POLICIES, LAWS, PLANS and REGULATIONS
9. AGROBIODIVERSITY LOSS DRIVERS & THREAT PERCEPTIONS
10. PARTNERSHIPS and COOPERATION AGREEMENTS
11. AGROBIODIVERSITY EDUCATION, LEARNING and PUBLIC AWARENESS
12. AGROBIODIVERSITY CONSERVATION or SUSTAINABLE USE ACTION RECOMMENDATIONS

MAIN THEMES/QUESTION TYPES
IN SURVEY of AMS

AMS REPORTING OF or PERCEPTIONS ABOUT

1. Capacities & Resources (Past and Current)
2. Enabling Environment & Tools (or inhibiting factors/drivers)
3. Needs or Recommendations (about what should be done next)

......For AGROBIODIVERSITY MANAGEMENT & SUSTAINABLE USE
Survey Responses

Responses or Completed Surveys Submitted to ACB by:

- Cambodia
- Laos (Plan Document only submitted, without Survey)
- Myanmar
- Philippines
- Viet Nam

No Completed Survey Docs submitted by:

- Brunei
- Indonesia
- Malaysia
- Singapore
- Thailand

Some Missing Data or Incomplete Questions in Some Completed Surveys

One AMS (Laos) submitted full Lao PDR national Agro-biodiversity Programme and Action Plan II (2015-2025) but no completed Survey Data

Cambodia DATA (1) – Capacities & Resources

SCIENTIFIC DATA (Collection, Management and Analysis) – YES

- Agricultural Plant & Crop Data Management (Ministry of Agriculture, Forestry and Fisheries)
- Biodiversity Species Data Management (Ministry of Environment)

BUDGETS (No Data provided)

GENETIC RESOURCES, BREEDING PROGRAMS and SEED BANKS

- YES. Some government managed, but...
- NONE by international agencies (or at least none reported in survey)

HUMAN RESOURCE CAPACITIES –

- None Reported (No dedicated Agrobiodiversity Personnel)
Cambodia DATA(3) NEEDS & RECOMMENDATIONS

Cambodia AGROBIO DIVERSITY CONSERVATION or SUSTAINABLE USE ACTION RECOMMENDATIONS

- **NONE** specifically made in Survey

- (But) Suggests using recommendations already implied/outlined in:

  5th National Biodiversity Strategy and Action Plan (NBSAP) (February 2016) particularly related to Theme 13: Sustainable Agriculture and Animal Production

Laos

Background

- First National Agro-Biodiversity Programme, running from 2005 to 2012.

- In 2014, with assistance from FAO, MAF began revision of NABP II through a participatory process led by National Agricultural and Forestry Research Institute (NAFRI)

- The Agro-Biodiversity Initiative (TABI) has been donor supported by Swiss Agency for Development and Cooperation (SDC)

Survey

- Not Completed/No data submitted

Submitted full Background Document (Plan) to ACB


- New Programme and Action Plan II (2015-2025) provides some good documentation and extensive analysis of Laos Agrobiodiversity with Relevant Action Commitments related to CBD-Aichi Targets
Myanmar DATA (1) – Capacities & Resources

SCIENTIFIC DATA (Collection, Management and Analysis) – YES

- Ministry of Agriculture Livestock and Irrigation
- Ministry of Environmental Conservation and Forestry

BUDGETS (for AGROBIODIVERSITY)

- USD 75,782 in National Budget and 5 projects (donor funded or managed) USD 45,000

GENETIC RESOURCES, BREEDING PROGRAMS and SEED BANKS

- YES. Some government managed - Germplasm conserved in Seed Bank
- YES by international agencies (reported, but NOT NAMED in survey)

HUMAN RESOURCE CAPACITIES – 19 staff

- (16 Scientists and 3 Administrative Personnel responsible for Agrobiodiversity)

Myanmar DATA (2) – Enabling (or Inhibiting) Environment & Tools

AGROBIODIVERSITY POLICIES, LAWS, PLANS and REGULATIONS –

- YES (or at least reported) in 14 separate laws/regulations (1989 to 2012) – Not Agrobiodiversity specific

NATIONAL PLANS PERTAINING TO AGROBIODIVERSITY CONSERVATION, USE OR RESEARCH?

- YES (but principally in National Biodiversity Strategy and Action Plan, (NBSAP) 2015-2020

DRIVERS OF AGROBIODIVERSITY LOSS & THREAT PERCEPTIONS

- Referred to Table 33 in NBSAP for Aichi Target 13

PARTNERSHIPS OR MOUs ON AGROBIODIVERSITY

- YES (several named)

AGROBIODIVERSITY EDUCATION, LEARNING & PUBLIC AWARENESS (or Univ Progs)

- YES (a few courses by Yezin Agricultural University and University of Forestry)
Myanmar DATA (3) NEEDS & RECOMMENDATIONS

Myanmar AGROBIO DIVERSITY CONSERVATION or SUSTAINABLE USE ACTION
RECOMMENDATIONS

- NONE specifically made in Survey
- (But) Suggests using recommendations already implied/outlined in:

Annex 1 (Summary of selected targets and associated indicators inked to Aichi
Targets specifically, over 5 years to 2020, pp. 123 to 128)

Philippines (1) DATA – Capacities & Resources

SCIENTIFIC DATA (Collection, Management and Analysis) – YES

- Department of Environment and Natural Resources (DENR); Department of
Agriculture (DA); University of the Philippines (UP)- Institute of Plant Breeding;
Philippine Statistical Authority (PSA); UPLB Museum of Natural History, BIOTECH

BUDGETS (for AGROBIODIVERSITY related Projects)

- USD 17,022,061 from External Donors plus at least 3 projects (donor
funded/managed from UNDP, FAO/UN-GEF)

GENETIC RESOURCES, BREEDING PROGRAMS and SEED BANKS

- YES. Some government managed by UP Los Baños Institute of Plant Breeding, DA-
BAR – Bureau of Agricultural Research and DA-BPI – Bureau of Plant Industry
Regional Research Center
- YES by international agencies (particularly IRRI)

HUMAN RESOURCE CAPACITIES – 19 staff

- (16 Scientists and 3 Administrative Personnel responsible for Agrobiodiversity)
Philippines (2) DATA – Enabling (or Inhibiting) Environment & Tools

AGROBIODIVERSITY POLICIES, LAWS, PLANS and REGULATIONS –
• **YES** in 4 separate laws/regulations – Some Not Agrobiodiversity specific

NATIONAL PLANS PERTAINING TO AGROBIODIVERSITY CONSERVATION, USE OR RESEARCH?
• **YES** (principally in Philippine Biodiversity Strategy and Action Plan (2015-2028) and plans related to land degradation)

DRIVERS OF AGROBIODIVERSITY LOSS & THREAT PERCEPTIONS
• **Possible Direct:** including habitat destruction/conversion of agricultural land; impacts of biotechnology; extreme weather events/climate change; invasive alien species, pests and diseases; and institutional problems (as well as several **Indirect**)

PARTNERSHIPS OR MOUs ON AGROBIODIVERSITY
• **YES** (several) – Academic, Government and NGO

AGROBIODIVERSITY EDUCATION, LEARNING and PUBLIC AWARENESS (or Uni Progs)
• **YES:** Agricultural Training Institute (ATI), UP Los Baños, Philippine Council for Agriculture, Forestry and Natural Resources Research & Development (DOST), etc.

Philippines DATA (3) NEEDS & RECOMMENDATIONS

Philippines AGROBIODIVERSITY CONSERVATION or SUSTAINABLE USE ACTION RECOMMENDATIONS
• Policy level - approval of the draft DENR-DA Biodiversity Friendly Agricultural Practices (BDFAPs) Joint Administrative Order
• Tie up BDFAPs with Biodiversity Friendly Enterprises (BDFEs)
• Follow thru activities to sustain the recognition, mainstreaming and in-situ conservation and adaptive management of potential NAHS/GIAHS
• Short courses or trainings on agrobiodiversity conservation both at the National and Field levels

Regional Workshop on Maintaining Biodiversity in Agriculture for Sustainable Development and Food Security in Southeast Asia International Education and Training Center, Maejo University, Chiang Mai, Thailand | 13-14 September 2017
Viet Nam (1) DATA – Capacities & Resources

SCIENTIFIC DATA (Collection, Management and Analysis) – YES

- Ministry of Agriculture and Rural development (MARD) and several institutes under MARD: 1. Central of plant resources (Vietnamese Academy of agricultural Sciences – VASS); 2. Institute of Livestock; 3. Institute of animal health. Research Institute for aquaculture; and 4. Research Institute for marine fisheries

BUDGETS (for AGROBIODIVERSITY related Projects)

- USD $600,000 (approx) in National Budget and $USD 90,000 at national level (for genetic conservation programs, breeding programs). Re External Donors (details to follow)

GENETIC RESOURCES, BREEDING PROGRAMS and SEED BANKS

- YES by government (not named) and NO by international agencies

HUMAN RESOURCE CAPACITIES – 19 staff

- 400 government employees working for agencies under MARD related to agrobiodiversity issues

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Viet Nam DATA (2) – Enabling (or Inhibiting) Environment & Tools

AGROBIODIVERSITY POLICIES, LAWS, PLANS and REGULATIONS –

- YES at least 15 Separate laws/regulations – Some Not Agrobiodiversity specific

NATIONAL PLANS re AGROBIODIVERSITY CONSERVATION, USE OR RESEARCH?

- YES (principally in National biodiversity strategy to 2020 and Vision to 2030. No action plan for implementing this strategy.

DRIVERS OF AGROBIODIVERSITY LOSS & THREAT PERCEPTIONS

- Forest, marine, soil, water habitat systems loss caused by economic development,
- Emergence of Industrial livestock breeds, hybrid varieties through local extension programs and projects,
- Climate change, extreme weather as unusual cold weather, hot, dry weather caused of degradation agrobiodiversity
- Low awareness on value of agrobiodiversity of all stakeholders

PARTNERSHIPS OR MOUS ON AGROBIODIVERSITY - NONE (reported)

AGROBIODIVERSITY EDUCATION, LEARNING and PUBLIC AWARENESS (or Uni Progs)

- YES. Univ of VN Forestry; VN agric Acad; Univ of nat res and env; Can Tho Univ
Viet Nam DATA (3) NEEDS & RECOMMENDATIONS

Viet Nam AGROBIODIVERSITY CONSERVATION or SUSTAINABLE USE ACTION RECOMMENDATIONS

- Develop action plans for protecting agrobiodiversity
- Enhance capacity in managing protected areas (national parks, marine protected areas, wetland) to well managed habitats for agrobiodiversity.
- Apply ecosystem services and economical tools in managing protected areas, proposal policies on finance mechanisms to create sustainable incomes for national parks to protect habitats for agrobiodiversity
- To prioritize investment in programs on surveying the current status of agricultural bio-diversity, updating, reviewing and supplementing the list of endangered precious
- Complete data base on agrobiodiversity;
- Develop science research programs on agrobiodiversity; models and projects of accessing and benefit sharing in using agrobiodiversity
- Programs on capacity building for staffs who are working in genetic resources conservation
- Enhance international and regional cooperation in agrobiodiversity.

2. RECENT NATIONAL REPORTS & PLANS

2. NATIONAL BIODIVERSITY REPORTS & PLANS –

Selected Highlights
(of Agro-biodiversity enabling Approaches, Commitments or Actions)
Brunei Darussalam

Brunei References to CBD/Aichi targets (with selected responses)

- **Target 7** - By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

- **Target 8** - By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

The use and importation of inorganic fertilizers in the country is highly regulated. The country has set its sustainable target for agriculture purposes of not more than 1% of the country’s land area and thereby controls the leaching of important nutrients to adjacent ecosystems. The use of organic fertilizers is also encouraged for use in the country.

Source

- *National Biological Resources (Biodiversity) Policy and Strategic Plan of Action* (nd)

Cambodia

Cambodia References (selected) re CBD/Aichi targets and complementary assumptions/recommended actions

- Cambodia Target 5 (Aichi Target 7): By 2020 the majority of areas under agriculture, animal production, aquaculture and forestry are managed sustainably;

- 2.6 Adopt farming systems (e.g. multiple cropping systems, use of biomass mulching, low greenhouse gas emission agriculture and animal production) that are more resilient to climate change and that emit less greenhouse gases

- The Government’s agricultural strategy promotes diversified farming systems, agro-forestry and protection, and the management of critical watersheds... link to the maintenance of protected areas and biodiversity are considered critical to maintaining stability in agricultural systems and in ensuring food security.

- ... agricultural productivity can be promoted and maintained in the longer term if organic agricultural practices are promoted

Source

- *5th National Biodiversity Strategy and Action Plan (NBSAP)February 2016*
Indonesia

References (selected) re CBD/Aichi targets and associated actions

National targets for biodiversity management 2015-2020, include, amongst others:

- 6. Ensure policy for sustainable management and harvest;
- 7. Increase agriculture area, plantation and animal farming managed in sustainable manner;
- 8. Reduce pollution level that destroy natural resources and ecosystem function;

By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

- Up to 2013, 8 organic certification institutions established in Indonesia. In 2011 certified organic agriculture area reached 90,135.30 ha and the ongoing certification process

Source:
The fifth national report to the convention on biological diversity

Lao PDR

References (selected) re CBD/Aichi targets and associated actions

Objective 10: Support the conservation of biodiversity through ecologically sustainable agriculture...CHAPTER 6. IMPLEMENTING 2020 AICHI BIODIVERSITY TARGETS

...number of steps that have been made towards the use of natural resources in a sustainable way, particularly related to organic agriculture

Integrated Pest Management has been carried out and farmer field schools...with the view to optimize the use of local biodiversity, including natural pest enemies, organic fertilizers, and bio-insecticides

Aichi Target 17. NBSAP Implementation

- A Sub-Sector Working Group on Agro-biodiversity has been developed with a multi-sectoral approach and with recommendations...to...top level government

Source(s)
Malaysia

Malaysia References (selected) re CBD/Aichi targets and associated actions

- **Target 4**: By 2025, our production forests, agriculture production and fisheries are managed and harvested sustainably.

- **Target 13**: By 2025, the **genetic diversity of cultivated plants** and farmed and domesticated **animals** and of **wild relatives** is adequately **conserved**

- **Key indicator 4.2**: By 2025, 50% of all agricultural areas are sustainably managed (i.e. certified under schemes such as MSPO, RSPO, MyGAP, etc.).

- **Key indicator 4.4**: By 2021, **perverse subsidies** in the **agriculture**, forestry and fisheries sectors have been identified and rationalized

- **Action 13.1 Support** the implementation of the National Strategies and **Action Plans on Agricultural Biodiversity** Conservation and Sustainable Utilisation

**Source**

*National Policy on Biological Diversity 2016 – 2025*

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Myanmar

Myanmar References (selected) re CBD/Aichi targets and associated actions

- **Target 7**: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

- **Target 8**: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

- **6.13 Aichi Target 13**: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity

- **Myanmar’s draft national seed policy** recognizes the **rights of farmers... to cultivate diverse landraces and participate in seed saver networks and exchanges**. However, while most of the seeds used in Myanmar are produced by farmers, the extension services promote the use of commercial seeds. This is a barrier to preserving on-farm genetic diversity.

**Source**

Philippines

Philippines References (selected)

- **Agrobiodiversity** has been developed through the application of the knowledge and skills of farmers, herders and fisherfolk in a wide range of agroecosystems. The knowledge it has produced is **key to global food security** because of their wild relatives....

Organic Agriculture Act of 2010 (RA 10068)

- 1) **policy formulation** on on regulation, registration, accreditation, certification and labeling on organic agriculture; 2) development and extension of appropriate sustainable environment and gender-friendly organic agriculture; 3) accelerate the production and commercialization of organic fertilizers, pesticides, herbicides and other appropriate farm inputs; and 4) **implementation of organic agricultural programs, projects and activities**...

Target

- 11 By 2028, there will be a 10% **increase** in agricultural areas devoted to all types of **biodiversity-friendly agriculture**.
- 15 By 2028, there will be at least 10 nationally recognized agricultural heritage systems.
- **Agrobiodiversity Guidelines for LGUs**

Source

2015-2028 Philippine Biodiversity Strategy and Action Plan (PBSAP)

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Singapore

Singapore References (selected)

Refers to (for informational or analytical purposes only):

- **Target 7**: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
- **Target 8**: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem

But explanation is as follows:

- "**Not relevant for Singapore.** Singapore has limited agriculture and aquaculture, and no forestry sector."

Source

Thailand

Strategic goal B: Reduce the direct pressures on biodiversity and promote sustainable use

- 7. Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity
- 3.1) Manage agricultural areas, aquaculture, and forestry in a sustainable manner, with responsibility for the environment to assure conservation of biodiversity and ecosystems and incorporate biodiversity issues into relevant environmental standards.

Measure 2 Promote sustainable utilization of biodiversity

- 2.1) Develop and promote implementation of good practices for sustainable production and consumption in order to ensure food and health security and community strength.
- 8. Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

Source

Viet Nam

Viet Nam References (selected)

- 3.1.3. Sustainable use, fair and equitable access, and sharing of benefits derived from ecosystems and biodiversity
- Develop and implement policies to support agricultural, forestry, and fisheries products that meet international standards for conservation and sustainable use of biological resources;
- ...Conservation and development of agricultural biodiversity... Announce and complete conservation system to effectively conserve crop varieties, animal breeds, native agricultural microorganisms, etc. that are rare, valuable and possess high socioeconomic values.
- ...Ensure 100% genetically modified organisms and their products and goods which are placed on the market have passed risk assessments in Vietnam, and that they are tagged, monitored and supervised as prescribed by law

Source
- Vietnam National Biodiversity Strategy - to 2020, Vision to 2030
3. SOUTH EAST ASIAN REGIONAL ASSESSMENT (Preliminary)

3. SOUTH EAST ASIAN REGIONAL ASSESSMENT
Key Themes and Highlights
from
ASEAN Biodiversity Outlook (ABO2), 2017
ASEAN Centre for Biodiversity

Key Regional Themes/Challenges
(within or across several AMS)

- **Genetic erosion** reported in 5 National Biodiversity Reports where several AMS identified recent introduction of new, modern, and high-yielding varieties as one of the causes of genetic erosion of native crop varieties of rice and other cereals. Similarly, for livestock, high-yielding imported breeds were preferred to meet high demands and increase profitability not possible with some local breeds.

- **Conversion of agricultural lands** for increasing urban populations for residential areas and industrial uses and even golf courses near cities while the proportion of arable area to total agricultural area decreases.

- **Decline in pollination services** from bees, butterflies, wasps, birds, and bats which provide essential services for sustaining biodiversity as well as food production recognizing that the ASEAN region is among the top producers and exporters of re pollination-dependent crops

- **Invasive alien species (IAS)**, associated sometimes with increasing trade in the region while potential for IAS incursions has become increasingly important with many noxious weeds especially impacting a range of sectors, including crops and pasture production.

(ABO2, ASEAN Centre for Biodiversity, 2017, pp. 51-52).
Measuring Regional Progress on CBD Obligations (YELLOW LIGHT - TARGET 7)

Measuring regional progress on SUSTAINABLE USE

Re: Strategic Aichi Goal B: “Reduce the direct pressures on biodiversity and promote sustainable use” and meeting Target 7 the ABO2 suggests:

- Forest encroachment, agricultural land conversion and heavy reliance on chemical production inputs threaten ecosystem services essential to the conduct of agriculture in the ASEAN region...the proportion of agricultural land to total land area declines as the urban population of the region increases. There is a need to support and promote agro-ecological farming practices and initiatives

(YELLOW LIGHT, ASEAN Centre for Biodiversity, 2017, p. 24)

The YELLOW LIGHT means “at least half of AMS have reported they have mobilized necessary actions...”

Measuring Regional Progress on CBD Obligations (RED LIGHT TARGET 13)

Measuring regional progress SAFEGUARDING DIVERSITY

Concerning Strategic Goal C: To improve the Status of biodiversity by safeguarding ecosystems, species and genetic diversity re meeting Target 13 the ABO2 suggests:

In-situ and ex-situ efforts are in place to conserve native and wild varieties of crops and livestock. Several gene banks have been established for important crops and livestock species. Out of 7.4 million accessions of plant genetic resources for food and agriculture maintained globally, eight percent are safely stored in gene banks in the ASEAN region. Moreover, evaluation and characterization of these accessions are also being done. There is a need to, establish an interoperable database platform to ensure the safety of these genetic resources and regularly monitor storage facilities (RED LIGHT, ASEAN Centre for Biodiversity, 2017, p. 26)

The RED LIGHT means “less than half of AMS have mobilized initiatives leading towards achievement of this Achi Target and have not demonstrated positive impacts”
Measuring Regional Progress on CBD Obligations (YELLOW LIGHT - TARGET 20)

Measuring regional progress AVAILABLE RESOURCES

Although there has been some recognition of the importance of biodiversity conservation with financial allocations for various activities from local to the national level this has been

"...not always in an organized fashion nor streamlined with National Plans and Programmes and the Strategic Plan for Biodiversity." (Yellow light, ASEAN Centre for Biodiversity, 2017, p. 27)

Again...The YELLOW LIGHT means "at least half of AMS have reported they have mobilized necessary actions..."

Suggested “Ways Forward” (from ABO2)

Overall the ABO2 suggests that we need to better provide genetic diversity to enhance and sustain agricultural productivity

This is an essential part of the “Ways Forward” it recommends in particular (and minimally) as follows:

• Better Ex-Situ and In Situ Conservation
• Making crucial information available
• Establishment of an ASEAN Regionally Important Heritage System (ARIAHAS)
• Improving the ASEAN Policy framework for Agricultural Biodiversity

(ASEAN Centre for Biodiversity, 2017, pp. 49-55)
4. ASEAN POLICIES & PLANS

4. ASEAN POLICIES & PLANS for AGROBIODIVERSITY ("Missing in Action")

What Relevant ASEAN Policy frameworks exist?

QUESTIONS TO BEGIN

• What do we know?
• Where do we start to move forward?

.............To IMPROVE the ASEAN POLICY FRAMEWORK FOR AGRICULTURAL BIODIVERSITY (called for ASEAN Centre for Biodiversity, 2017, in ABO2)

PRELIMINARY (but incomplete) ANSWERS

1. FIRST. Evaluate all Existing National Biodiversity Reports and Plans of AMS (noted above) for agrobiodiversity commitments and content

2. SECOND. Look at Existing Agriculture-Associated ASEAN Plans (and gaps)

>>>>> NEXT......
AGROBIODIVERSITY Commitments (or Gaps) in Key ASEAN Plans

1. ASEAN Socio-Cultural Community Blueprint 2025 - NONE

2. ASEAN Integrated Food Security (AIFS) Framework and Strategic Plan of Action on Food Security in the ASEAN region (SPA-FS) 2015-2020 - NONE - No strategy for Agricultural Biodiversity or Food-Related Biodiversity in ASEAN

3. ASEAN Strategic Plan of Action for Cooperation on Livestock (2016-2020) - INDIRECT - Promote policies to minimise negative externalities of livestock on biodiversity

4. Strategy and Action Plan for Sustainable Management of Peatlands in ASEAN Member States 2006-2020 - NONE - No Agricultural Biodiversity or Food-Related Biodiversity strategy in Peatlands

5. Strategic Plan of Action for ASEAN cooperation on Crops (2016-2020) - NONE - No strategy on Agricultural Biodiversity or Food-Related Biodiversity crops

6. Framework of Strategic Plan of Action for ASEAN Cooperation on Organic Agriculture (2014 to 2017) - NONE - No strategy for Agricultural Biodiversity associated with OA (Despite a priority in many AMS-NRAPS)

7. ASEAN Plan of Action on Science, Technology and Innovation (APASTI) 2016-2025 - MINIMAL/INDIRECT - BUT No clear strategy for Agricultural Biodiversity specifically associated with STI

8. Vision & Strat Plan for ASEAN Cooperation in Food, Agric, Forestry 2016-2025 (SP-FAF) - INDIRECT - Strengthen ASEAN joint approaches on international and regional issues... developing ASEAN common positions on relevant issues on trade, climate change, forestry, BIODIVERSITY CONSERVATION

Key Findings & Recommendations from Background Study

Key Findings and Message (From AMS Survey and Background Study)

- AGROBIODIVERSITY is "MISSING IN ACTION" (or at most a tangential consideration) in most current ASEAN Regional Agriculture-related ASEAN Policies and Plans

- Agrobiodiversity NEEDS TO BE MAINSTREAMED across 1) all existing ASEAN Plans associated with Food and Agriculture (AND 2) across different Ministries/Departments (Agriculture, Environment, Science, Commerce, etc.)

- ACTION RECOMMENDATION: Agrobiodiversity should have its own ASEAN Regional Action Plan (RAP) on Agrobiodiversity Mainstreaming, Conservation and Sustainable Use (AMCSU), 2017-2020. (Process led by ACB-SEARCA with key partners)

Source
5. CONCLUSIONS/IMPLICATIONS

(Summary of AMS & ASEAN Themes, Priorities, Data/Gaps – Research, Planning and Capacity Development Needs)

Selected Issue Highlights from 2017 ACB Survey and National Reports or Plans

National Agrobiodiversity Resources, Documentation and Planning in AMS
- Largely Absent or Small budget commitments (except LAOS and PHILIPPINES)
- Mostly External Project Driven (not mainstreamed well in national budgets)

Threat Driver/Mitigation or Adaptation Debates and (unresolved) Policy Conflicts
- Climate Change (CAMBODIA; PHILIPPINES and VIET NAM)
- Farmer Rights/Seed saving policy - Commercial vs local seed saving (MYANMAR)
- Impacts or Risks of biotechnology or GMO regulation (PHILIPPINES and VIET NAM)
- Perverse agriculture (or other) subsidies (MALAYSIA)
- Pollution or its mitigation/prevention (BRUNEI and THAILAND)

GENERAL - Conservation or Sustainable Use Strategies Mentioned (current/needed)
- Multiple cropping or Diversified Farming Systems (CAMBODIA);
- Integrated Pest Management (IPM) with Other approaches (LAOS)

SPECIFIC - Organic Approaches or Certification Systems (a theme in several AMS)
- Mentioned by BRUNEI, CAMBODIA, INDONESIA, LAOS, PHILIPPINES & VIET NAM
IN SUMMARY – Main Challenges for AMS, ASEAN and Partners
(Reflecting on preliminary survey data, ABO2 & ASEAN Plans)

1. Limited Survey Reporting
   - Survey data so far is incomplete (not submitted from all AMS)
   - Reported data requires follow-up to better clarify gaps

2. Data, Knowledge Management and Science Gaps In AMS
   - Some already identified Data, Knowledge Management and Science Gaps

3. Policy Concerns (Development, Analysis, Reform and Coherence)
   - New work is needed to develop, strengthen and align AMS (and ASEAN-level)
     policies with CBD reporting and other international processes (re SDGs and more)

4. Lack of Independent Monitoring and Evaluation
   - Self-reporting by AMS not adequate. Independent/peer-review analysis is essential for based on good scientific research to inform policy and practice
   - More should be done with partners/scientists and regional/international agencies

5. New Research and Capacity Development Needed
   - Should be part of new National and ASEAN Regional Action (Planning)
   - Technical Cooperation with partners and Donor Support is essential to assist

CORE THEME (1) - Need to Integrate Future ASEAN Planning with
CBD Programme of Work on Agricultural Biodiversity
(Next Steps >>>> DAY TWO >>>> WAYS FORWARD)

CBD Programme of Work on Agricultural Biodiversity based on four elements:

1. Assessments
2. Adaptive management
3. Capacity-building
4. Mainstreaming

Workshop Day Two (13 Sept, 14:45 – 15:30) Ways Forward and Recommendations

- Discuss CBD Work Programme Issues/Gaps and Needs among AMS in 4 dimensions
- Suggest specific goals, targets and activities on how to “Improve the ASEAN Policy framework for Agricultural Biodiversity” (called for in ABO2) for AMS in CBD
CORE THEME (2) Next Steps/WAYS FORWARD CONT.--Need to
Draft/Fund/Implement Science & Capacity-Building Action Plans

Next Steps (post Chiang Mai workshop) should include at least four (4) main commitments on Regional
Policy Coordination and Science Cooperation: from ACB, SEARCA and AMS:

1. DEVELOP an ASEAN Regional Action Plan (RAP) on Agrobiodiversity Mainstreaming, Conservation
   and Sustainable Use (AMCSU), 2017-2020 in consultation with AMS and approved by early 2018.

2. LAUNCH a New Agrobiodiversity Research and Capacity building Project on: Mapping and
   Mainstreaming Agrobiodiversity in ASEAN Member States, 2018-2020 aligned with National
   Agrobiodiversity Plans and CBD/Aichi Target Reporting (SECURE ADEQUATE DONOR FUNDS)

3. DEVELOP National Agro-Biodiversity Strategy and Action Plans (NASAPs) for all 10 AMS through a
   collaborative applied cross-learning effort between and among AMS, scientists and other partners.

4. PUBLISH by early 2020 an ASEAN Regional Report on State of Agrobiodiversity (arising from the new
   research project requiring scientific partnerships with AMS) included as a component of any reporting
   to the CBD-COP re Assessment of Aichi Targets CBD. Follow model/template of the ABO (1st and 2nd
   editions) with an Agrobiodiversity theme.

The above INTERGOVERNMENTAL and ACADEMIC/TECHNICAL work can be integrated with but separate
from the CBD Process. However, complementary, mutually supportive work can be guided by CGIAR, UN,
civil society, farmer groups and other scientific, technical and capacity building partners with donors.

End

Thank you

***

Comments/Questions?
Dr. Rosliza Binti Jajuli - Developing Policies & Legal Frameworks for the Conservation of Agroecological Areas in a Fast Growing Economy
THE ROLE OF AGROBIODIVERSITY

Experience and research have shown that agrobiodiversity can:
- Increase productivity, food security, and economic returns
- Reduce the pressure of agriculture on fragile areas, forests and endangered species
- Make farming systems more stable, robust, and sustainable
- Contribute to sound pest and disease management
- Conserve soil and increase natural soil fertility and health
- Contribute to sustainable intensification
- Diversify products and income opportunities
- Reduce or spread risks to individuals and nations
- Help maximize effective use of resources and the environment
- Reduce dependency on external inputs
- Improve human nutrition and provide sources of medicines and vitamins, and
- Conserve ecosystem structure and stability of species diversity.

SCHEMATIC ON AGRICULTURE GENETIC RESOURCE AND ITS RELATION TO INTERNATIONAL INSTRUMENTS (Mohamad et al., 2006)
Agrobiodiversity has long been recognized as the most valuable part of our national resources for sustainable agricultural development. It is the fundamental feature of farming systems that encompasses many types of biological resources for food and agriculture including edible plants and crops, livestocks, microorganisms, arthropods and agro-ecosystem components.

Agriculture sector continued to expand in 2015 with a contribution of 8.9 per cent to the Gross Domestic Product (GDP). Oil palm was a major contributor to the GDP of agriculture sector at 46.9 per cent followed by other agriculture (17.7%), livestock (10.7%), fishing (10.7%), rubber (7.2%) as well as forestry & logging (6.9%) in 2015.

In Malaysia, agrobiodiversity is managed by the Ministry of Agriculture and Agro-based Industry (MOA) and implemented by various agencies under the ministry such as MARDI, DOA, DVS, DOF. As for PGRFA, these largely consist of various plantations, rice fields, fruit orchards and vegetable farms as well as wild crop relatives conserved in situ or ex situ and further utilised sustainably.

As an important subsector, the National Strategies and Action Plans on Agrobiodiversity Conservation and Sustainable Utilisation was published in 2010, improved and launched in 2012 to guide the national stakeholders to conserve and sustainably utilised agrobiodiversity resources until 2020.
DRIVERS OF CHANGE

- Among major drivers of biodiversity loss;
- land degradation,
- urbanization,
- watershed pollution,
- climate change and
- invasive alien species
State of associate biodiversity and ecosystem services

<table>
<thead>
<tr>
<th>Components of associated biodiversity</th>
<th>Organisms, species and subspecies conserved</th>
<th>Size of collection</th>
<th>Conservation conditions</th>
<th>Objectives</th>
<th>Characterization and evaluation status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microorganism</td>
<td>Food processing microorganism</td>
<td>505 cultures</td>
<td>MARDI</td>
<td>Food processing</td>
<td>Characterized</td>
</tr>
<tr>
<td></td>
<td>Microbial collection</td>
<td>2065 strains</td>
<td>MARDI</td>
<td>Biodenitrizer, biocompost, biocontrol, bioremediation, food safety and animal feed</td>
<td>Characterized</td>
</tr>
<tr>
<td>Invertebrates</td>
<td>Pollinators/ Stingless bee (Meliponinae)</td>
<td>11 species</td>
<td>Live colonies (MARDI)</td>
<td>Pollination/stingless bee honey production</td>
<td>Characterized</td>
</tr>
<tr>
<td></td>
<td>Insects</td>
<td>30,000 specimen</td>
<td>Insect museum (MARDI)</td>
<td>Referral center for arthropod related to agriculture</td>
<td>characterized</td>
</tr>
</tbody>
</table>

ECOSYSTEM SERVICES: DIRECT & INDIRECT ECONOMIC VALUE

- Over 75% of world’s crop plants rely on pollination by animals, (mostly insects) estimated at €1.53 billion (Gallai et al. 2007)
- 9.5% of the value of the world agricultural production used for human food in 2005
- Vegetables and fruits were the leading crop categories in value of insect pollination with about €50 billion each, followed by edible oil crops, stimulants, nuts and spices.
- Pollination service by insects in Malaysia estimated worth USD 6 billion (Agriculture & Forestry)
- Loss of pollinators reduces crop yield through reduced and unreliable pollination
Ecosystem approach

- Few initiatives or programmes also were undertaken to support the biodiversity works in the country as mention in the 5th National Report to CBD, comprising The Central Forest Spine Master Plan (CFS), The Heart of Borneo Initiative (HoB) and the Coral Triangle Initiative-Coral Reefs, Fishery and Food Security (CTI-CFF). The projects will be expected to produce measurable targets for biodiversity conservation and its sustainable use in Malaysia. As example, one of the 5 pillars in the Sarawak Strategic Plan of HoB will focus on the sustainable agriculture and land use in order to improve the livelihood of local communities, ensure productivity and income without compromising the sustainability.
MyGeneBank™

- Bank Gen Padi MARDI @ Seberang Perai
  - 1974
  - 12,883 accessions

- Bank Gen Agromakanan Kebangsaan - MyGeneBank™
  - 2014
  - Duplicate accessions
GAPS

- Inconsistent enforcement
- Inadequate awareness and knowledge among the stakeholders
- Lack of data with regard to genetic resources for food and agriculture
- Insufficient manpower.
- Lack of informed decision-making
- Lack of public and stakeholder engagement
- Inadequate political will/political commitments

POLICIES & LEGAL FRAMEWORKS

- A common vision on Biodiversity (2009)
- The National Agro Food Policy 2011-2020 (2011)
- The Malaysian Organic Scheme (MOS) (2001)
- Plant Variety Protection Act (2004)
- National Policy on Climate Change, 2009
- National Environment Policy, 2002
- National Biotechnology Policy, 2006
- Sabah Biodiversity Enactment: 2000
- Access and Benefit Sharing Law 2017
GOAL 1

WE HAVE EMPOWERED AND HARNESSED THE COMMITMENT OF ALL STAKEHOLDERS TO CONSERVED BIODIVERSITY
GOAL 2

WE HAVE SIGNIFICANTLY REDUCED DIRECT AND INDIRECT PRESSURE ON BIODIVERSITY

GOAL 3

WE HAVE SAFEGUARDED ALL OUR KEY ECOSYSTEMS, SPECIES AND GENETIC DIVERSITY
GOAL 4

WE HAVE ENSURED THAT THE BENEFITS FROM THE UTILIZATION OF BIODIVERSITY ARE ACCRUED EQUATABLY TO ALL

GOAL 5

WE HAVE IMPROVED THE CAPACITY, KNOWLEDGE AND SKILLS OF ALL STAKEHOLDERS TO CONSERVED BIODIVERSITY
FUTURE STRATEGIES IN MAINSTREAMING AGROBIODIVERSITY IN MALAYSIA

- Policies and Future Strategies
- Regional and International Needs and Cooperation for Malaysia
Dr. Lorna E. Sister - Integration of the Conservation of Plant Genetic Diversity with Landscape-level Planning and Decentralized Government Planning: Experience and Lessons learned from "The Rice Roots Legacy"
The RICE Project

Integrating the Conservation of Plant Genetic Resources for Food and Agriculture into Decentralized Landscape Management for Food Security and Biodiversity Conservation in Critical Eco-regions of the Philippines

Project Duration: May 2015 to September 2016
Project Sites: Quirino, Antique, Iloilo, Davao Oriental provinces
Focus Crops: Rice, Sweetpotato, Yam, and Taro
Funding Agency: United Nations Development Programme (UNDP) FAO
Implementing Partners:

[Logos of implementing partners]
OBJECTIVES
of the ITPGRFA Project

- to strengthen the conservation of plant genetic diversity through integration with landscape-level planning and decentralized government programming; and,

- to develop a **Strategic Action Plan (SAP)** for conservation and sustainable use of plant genetic resources in three critical biogeographic regions

---

**Key Biodiversity Areas in/near the Project Areas**

- **Quirino Protected Landscape**
  Quirino Province

- **Central Panay Mountains**
  Iloilo and Antique Provinces

- **Mt. Hamiguitan**
  Davao Oriental Province
The Project Experience

Activities

Assessment and documentation - FGDS, KII, Secondary data

Conservation and management initiatives – CFS: benchmarking of local practices, technical input

Development of protocols for in situ/on farm crop conservation and a sustainable community seed supply system – CFS: Planning for community-based genebank

Farmer training and advocacy – CFS, Training of Trainors, IEC
Assessment and documentation of the extent of diversity

Planning and establishing community-based genebanks
Bugkalot tribe-inspired genebank managed by Farmers (women) Organization

Iluagao tribe-inspired genebank managed by village leaders
Concrete “typhoon-proof” Ifugao village genebank managed by village officers

Local government unit-managed genebanks

Retrofitted tool shed
Local government unit-managed genebanks

Conversion of room at the Municipal Agriculture Office

Local government unit-managed genebanks

Retrofit storeroom at the Municipal Agriculture Office
Policies initiated by communities and local government units

Communities
- Villages officers/Farmers’ group as curators
- Lobby for municipal ordinance regarding the protection / conservation of indigenous varieties

Local government units
- Dedicated regular staff (technician); new staff mentored in genebank operations
- Integrate Rice Roots Legacy into Annual Investment Plan (AIP) of municipality (LGU budget for genebank operations)
### 3. Lessons learned

#### Some drivers of conservation

<table>
<thead>
<tr>
<th>External demand (high volume)</th>
<th>Value chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply chain</td>
<td>Tourism</td>
</tr>
<tr>
<td>Food culture</td>
<td>Cultural pride</td>
</tr>
<tr>
<td>Markets</td>
<td></td>
</tr>
</tbody>
</table>
e.g., Taro fresh markets, Iloilo and Luzon

<table>
<thead>
<tr>
<th>Localized demand (low)</th>
<th>Niche markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household Consumption</td>
<td>e.g., organic/health food?</td>
</tr>
<tr>
<td>Food security</td>
<td></td>
</tr>
<tr>
<td>Cost avoidance</td>
<td></td>
</tr>
<tr>
<td>Cultural pride</td>
<td></td>
</tr>
<tr>
<td>Localized demand (low)</td>
<td></td>
</tr>
</tbody>
</table>
e.g., traditional rice varieties

### Table: Drivers of Conservation

<table>
<thead>
<tr>
<th>Demand Type</th>
<th>Supply Chain Drivers</th>
<th>Value Chain Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>External</td>
<td>Food culture, Markets</td>
<td>Tourism, Cultural pride</td>
</tr>
<tr>
<td></td>
<td>e.g., Taro fresh markets, Iloilo and Luzon</td>
<td>e.g., “Perya” of the Mandaya</td>
</tr>
<tr>
<td>Localized</td>
<td>Food security, Cost avoidance, Cultural pride</td>
<td>Niche markets</td>
</tr>
<tr>
<td></td>
<td>Localized demand (low), e.g., traditional rice varieties</td>
<td>e.g., organic/health food?</td>
</tr>
</tbody>
</table>
Lessons Towards a
draft Strategic Action Plan

1. Conservation
2. Sustainable Use
3. Institutional Arrangements and Policy
4. Education and Capacity Building

Insights for conservation initiatives

1. Document traditional crop varieties and traditional knowledge and practices on conservation
2. Assess and enhance traditional conservation practices with consideration for gender roles and relations
Insights for promoting sustainable use

- Document and promote good use practices of traditional crop varieties to inform product development and marketing initiatives
- Support market innovation for traditional crop varieties
- Strengthen local seed systems

Insights for Institutional Arrangements and Policies

- Conduct baseline institutional, policy, barrier and stakeholder analyses at the national and regional levels to serve as bases for policy recommendations for conservation and sustainable use of traditional varieties
- 2. Provide institutional support to community seed banks and gene banks by including them in national and local policies and plans
- 3. Lead in the formulation of policies for provision of loans/credits and crop insurance for traditional crop varieties production
- 4. Incorporate conservation and sustainable use of traditional crop varieties in local policies and plans
- 5. Incorporate traditional crop variety conservation in the monitoring system of DA-BAR
Insights for Institutional Arrangements and Policies

6. Promote conservation and sustainable use of traditional crop varieties by incorporating payment for conservation as a component of Payment for Environmental Services (PES)

7. Include production statistics of traditional crop varieties in the national agricultural statistics

8. Recognize and mainstream traditional varieties and local seed/planting material supply systems in the policies of Department of Agriculture, e.g. NSIC and PVP

9. Strengthen institutional arrangements that promote traditional crop varieties production, conservation and sustainable use

10. Local policy on access of materials and its enforcement

Insights for Education and Capacity Building

- Design an appropriate information dissemination and public awareness program

- Design capacity-building program on conservation and sustainable use for local government units and local organizations (women and farmer organizations/associations, cooperatives and other grassroots organizations) to enable them to craft appropriate policies and programs
Thank you
Ms. Clarissa Arida - Policy and management response options on the values of pollination and pollinators for food production
IPBES Organization

Plenary
Decision-making body
124 member states
Chaired by Dr. Zakri Abdul Hamid

Bureau
Overseeing administrative functions of IPBES
10 members

Multidisciplinary Expert Panel
Carrying out scientific and technical functions for implementation of work programme
25 members

Expert groups
19 groups for assessments, policy support tools, others

Secretariat
Executive Secretary: Dr. Anna Langanaderie
TSUs: Capacity building, K&D, T&L, Scenario, Regional assessments (4)

UN Partners

4 key functions of IPBES

IPBES has four agreed functions to achieve its goal.

Knowledge Generation
Catalyse efforts to generate new knowledge

Scientific Assessment
Deliver global, regional and thematic assessments on biodiversity and ecosystem services

Capacity Building
Prioritize key capacity building needs, and provide and call for financial and other support to address them

Policy Support
Identify policy relevant tools/methodologies, facilitate their use, and promote and catalyse their further development
Thematic Assessment: Pollinators, Pollination and Food Production

- The assessment has been carried out by experts from all regions of the world. They analysed a large body of knowledge, including about 3,000 scientific publications.
- It represents the state of our knowledge on this issue.
- The Report and all its chapters and the executive summaries were accepted.
- and its summary for policymakers was approved, by the Plenary of IPBES at its fourth session (22-28 February 2016, Kuala Lumpur).

IPBES assessed animal pollination as a regulating ecosystem service underpinning food production in the context of its contribution to nature's gift to people and supporting a good quality of life.

- The thematic assessment focuses on:
  - the role of native and managed pollinators
  - the status and trends of pollinators and pollinator-plant networks and pollination
  - drivers of change, impacts on human well-being, food production in response to pollination declines and deficits and the effectiveness of responses.
This assessment addresses two highly contentious and political issues:

1) the lethal and sub-lethal effects of pesticides, including neonicotinoids, on wild and managed bees; and

2) the direct and indirect effects of genetically modified crops on a range of pollinators.

CONCLUSIONS:

- The assessment concludes that recent evidence shows impacts of neonicotinoids on wild pollinator survival and reproduction at actual field exposure, but that the effects on managed honey bee colonies are conflicting.

- The assessment concludes that more research is needed to assess the impact of genetically modified crops on pollinators. The fact that the assessment could address such contentious issues in a balanced and credible manner demonstrates the value of an independent assessment of the evidence.
CONCLUSIONS

- The assessment concludes that 75% of our food crops and nearly 90% of wild flowering plants depend at least to some extent on animal pollination and that a high diversity of wild pollinators is critical to pollination even when managed bees are present in high numbers.

CONCLUSIONS:

- The Report provides a critical assessment of the full range of issues facing decision-makers, including the value of pollination and pollinators, status, trends and threats to pollinators and pollination, and policy and management response options.

- It concludes that pollinators, which are economically and socially important, are increasingly under threat from human activities, including climate change, with observed decreases in the abundance and diversity of wild pollinators.

- The report also outlines a wide range of management and response options that are available to halt the further decline of pollinators.
Overview of strategic responses to risks and opportunities associated with pollinators and pollination

- Improving current conditions for pollinators and/or maintaining pollination
  - Create uncultivated patches of vegetation such as field margins with extended flowering periods
  - Reward farmers for pollinator-friendly practices
  - Improved managed bee husbandry
  - Manage rights of way and vacant land in cities to support pollinators

(Excerpts from IPBES Table SPM 1. Overview of strategic responses to risks and opportunities associated with pollinators and pollination)

Overview of strategic responses to risks and opportunities associated with pollinators and pollination

- Transforming agricultural landscapes
  - Invest in ecological infrastructure
    - Restore natural habitats
    - Protect heritage sites and practices
    - Increase connectivity between habitats
    - Support large-scale land-use planning and traditional practices that manage habitat patchiness and ‘bio-cultural diversity’

(Excerpts from IPBES Table SPM 1. Overview of strategic responses to risks and opportunities associated with pollinators and pollination)
Overview of strategic responses to risks and opportunities associated with pollinators and pollination

- Transforming society’s relationship with nature
  - Integrate peoples’ diverse knowledge and values into management
  - Translate pollinator research into agricultural practices
  - Strengthen indigenous and local knowledge that fosters pollinations and pollinators
  - Monitor pollinators (collaboration between farmers, community and experts)

(Excerpts from IPBES Table SPM 1. Overview of strategic responses to risks and opportunities associated with pollinators and pollination)
Dr. Anja Gassner - Trees on farms (TonF) for ecosystem services, food security, and climate-change adaptation
Why are TonF Important?

- Agriculture, including rangelands, covers >30% of land globally, with trees being an integral part of most smallholdings.
- Globally, 40% of agricultural land has >10% tree cover; 13% has >30%.
- Yet TonF remain largely invisible in countries’ approaches to meet their UNCBD or UNCCC targets.
TonF contribution to ecosystem services

- Soil organic matter content
- Soil water moisture, shade, nutrient cycling, including nitrogen fixation for some tree species
- Protection from land degradation through erosion control
"The additive maize/cowpea intercropping option after cotton or maize resulted in an average overall LER of 1.47, no maize grain penalty, and 1.38 t ha\(^{-1}\) more cowpea fodder production compared with sole maize."
TonF contribution to biodiversity

- TonF planted and/or retained by farmers in agricultural landscapes where wild stands were once found are reservoirs of native tree biodiversity
  - by providing an alternative source of tree products TonF reduce extraction from forests and contribute directly to forest conservation
  - by acting as corridors or stepping stones that connect fragmented wild stands and conserve agrobiodiversity by maintaining local varieties
  - by providing habitat and breeding grounds for a wide variety of different species

Sawah: Rice paddies

(Walet sapi (Colocasia esculenta)
Kepiris laut (Apus pacificus)
Bondereh (Erythropus pyrrhocephalus)
Bondereh (Lonchura oryzivora)
Apung tamah (Anthus novaseelandiae)
Kor beragoyang (Motacilla cinerea)
Kareopadi (Amegops norvalis)
Baun Bangun tangah (Ixora cinnamomea)
Sekikak (Iodanthamph phayrei)
(N. olneyi)
(Trudy O'Connor)
Kopi monokultur: Sun coffee

Kopi campuran: Shade coffee
What are the incentives?

Mitigation

- Net increase of aboveground biomass (through higher stocking of trees) and increases in soil carbon
- Nair and Kumar (2011) provide an estimate of 3–15 tC/ha/yr
- For parklands in the Sahel, Luedeling and Neufeld (2012) estimated only 0.3 tC/ha/yr
What are the incentives?

Adaptation

- Tree products, such as timber, charcoal, firewood, fruit, mushrooms, roots and fodder, are important 'safety nets'
- Income diversification and adaptive strategies in communities facing increased climate variability and climate-related crop failures

Trees can deliver multiple benefits - Importance of fruits for food & nutrition security

- Fruits provide an easily available source of micronutrients

<table>
<thead>
<tr>
<th>Nutrient contents of selected fruits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species</td>
</tr>
<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Adansonia digitata</td>
</tr>
<tr>
<td>Grewia tenax</td>
</tr>
<tr>
<td>Tamarindus indica</td>
</tr>
<tr>
<td>Ziziphus mauritiana</td>
</tr>
<tr>
<td>Mango</td>
</tr>
<tr>
<td>Orange</td>
</tr>
<tr>
<td>Moringa leaves</td>
</tr>
</tbody>
</table>

- Overall fruit production and consumption are low, esp. for indigenous fruit trees (IFTs).

http://www.hort.jordu.edu/hewecrop/FamineFoods; Fruits for the Future Series, ICRAF; Finel (http://www.finel.fi), etc.
ICRAF’s work on Fruit Tree Portfolios: Year round fruit harvest for food and dietary gaps


Fruit Tree Portfolios: an agroforestry approach to addressing nutrition and food gaps

- Each month at least 1 fruit species is ready for harvest, even during the ’hunger gap’
- (Pro)vitamin A and C supply possible year-round if the below 10 species are grown on one farm
- The portfolio approach recommends the optimum number and combination of ecologically suitable tree species to provide for household food and nutrition gaps year round
- The portfolio can be developed to include suitable and complementary vegetables, as well as annual and staple crops to provide for a ‘whole diet’ approach

www.worldagroforestry.org
To improve countries' ability to meet ATs and SDGs by advancing knowledge of TonF for biodiversity and human well-being.

By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Sustainable Development Goal 15
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

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Acknowledgement of co-authors & organizers

- Robert Frederick Finlayson
- Ingrid Oborn
- Rodel Lasco
- Stephia McMullin
- Ravi Prabhu

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www.worldagroforestry.org
Dr. Kazuhiro Harada - Seeking Alternative Agricultural Livelihoods from Forest Resource Use by Local People under the Legal Land and Suppression: A Case of Bukit Barisan Selatan National Park in Indonesia

Regional Workshop on Agrobiodiversity
Sep. 12, 2017

International Education and Training Center,
Maejo University, Chaing Mai, Thailand

Seeking Alternative Agricultural Livelihoods from Forest Resource Use by Local People under the Legal Land and Suppression: A Case of Bukit Barisan Selatan National Park in Indonesia

Kazuhiro HARADA
Graduate School of Bioagricultural Sciences,
Nagoya University

National parks in Indonesia

Strategies of national parks in Indonesia
- Biodiversity conservation
- Climate change mitigation (REDD+)
- Rights of local people for using natural resources, including forests and lands

Local people are not allowed to settle down and do some activities. Biodiversity should be conserved including fauna and flora.
Conflicts between government and communities in national parks in Indonesia

- Customary use of natural resources within NPs by local people
  - Expanding agricultural lands for swidden agriculture, paddy fields
- Oil palm plantations within NPs by local people
  - Expanding oil palm plantations
  - Killing elephants
- Coffee plantations within NPs
  - Expanding coffee plantations for export

Purposes of the research and research methods

- Purposes
  - How do local people living adjacent to the national park use lands and forest resources?
  - How did the establishment of the national park and the introduction of WWF/the national park projects affect local livelihoods?
  - How local people can find alternative agriculture outside the national park?
- Research methods and research period
  - Interviews to WWF staffs and related persons of the park (Sep. 2013)
  - Interviews to local people in the target villages adjacent to the park (approximately 33 in a village for targeted two villages) (Sep. 2014, May, 2015)
Bukit Balisan National Park

- Location: Lampung province and Benkulu province in Sumatra Island
- Establishment: 1984, before 1984 the area was designated as strict nature reserve
  - Areas around the national park is conservation forest, production forest
- Land areas: 372,792ha (partially include marine area)
- Ecological environments: primary forest, secondary forest, tiger and elephant
- Local people:
  - Javanese immigrated from Java island
  - Indigenous people

Threats for the national park

- Poaching
- Illegal logging
- Conversion of forests to agricultural lands and dwellings
  - Expansion of coffee plantation, covering 70% of agricultural lands inside the national park
Coffee inside BBS-NP

- Average farmer occupied 2 Ha of agricultural land.
- 73% of agricultural land inside the park were coffee plantations.
- Average production was 588 kg per Ha per year of medium quality.

Total coffee production inside the park was estimated as:
45,657 Ha x 73% x 588 kg
= 19,600 tons
Amount of coffee exported and direction of countries coffee exported

- The amount of coffee from Lampung province is 222,288 ton in 2014
- Coffee production from inside the park is estimated to be 19,600 ton
- Coffee harvested inside the park, mixed with coffee outside the park is exported to abroad

Agricultural programs by the collaboration between WWF and government

- **Sustainable agriculture and effective use of buffer zone areas for agriculture**
- Training for technics of managing coffee and cacao
- **Rehabilitation of degraded lands**
  - Making nurseries
  - Plantation for 350 ha
- **Patrol by local people**
  - Collaboration with rangers
General information of targeted villages

- Village A (3,432 people, 880 households, 62.1 ha)
  - WWF projects are implemented and local people are using lands outside the national park
- Village B (2,891 people, 810 households, 1,143 ha)
  - WWF projects are NOT implemented
  - Local people are using lands inside the national park

<table>
<thead>
<tr>
<th>Table</th>
<th>Projects implemented in village A since the 2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011 - 2014</td>
<td>WWF: Nurturing seedlings (New trees)</td>
</tr>
<tr>
<td></td>
<td>WWF: Protection of elephants</td>
</tr>
<tr>
<td>2012 - 2014</td>
<td>Local NGO:</td>
</tr>
<tr>
<td></td>
<td>Kebun</td>
</tr>
<tr>
<td></td>
<td>Conserves management of agricultural lands</td>
</tr>
<tr>
<td>2013 - 2014</td>
<td>WWF: Training for technicians of managing cocoa and coffee</td>
</tr>
<tr>
<td>2009 - 2011</td>
<td>National park:</td>
</tr>
<tr>
<td>2009 - now</td>
<td>Providing grants (11)</td>
</tr>
<tr>
<td>2009 - 2011</td>
<td>Providing seedlings of agricultural crops (cacao, coffee)</td>
</tr>
</tbody>
</table>

Relationships between local people and the national park in village A

- 1970s: migrated from Java, Village A was created
- 1970s: forest logging, rattan and resin gathering, planting coffee and upland rice in the forest expanded areas, one-fifth of local people use lands inside the national park
- 1982: plantation program inside the park, leave from the park (agricultural lands and dwellings), coffee trees were left inside the park, prohibit of coffee tree management
- 1982-95: Many people continue to harvest coffee
- 1995-2012: Some people continue to harvest coffee
- 1982-90s: Many people gather rattan and damar, some people cut trees inside the park
- 1990s: Stricter national park management, provide seedlings of trees and durian
- Still gathering livestock seed
Land use inside and outside the national park in village A and village B

<table>
<thead>
<tr>
<th>Location of lands</th>
<th>Ha/households (A) (33hh)</th>
<th>% (A)</th>
<th>Ha/households (B) (6hh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside the park</td>
<td>0</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Outside the park</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private lands</td>
<td>2.2</td>
<td>91.3</td>
<td>0.05</td>
</tr>
<tr>
<td>Conservation forest</td>
<td>0.13</td>
<td>5.4</td>
<td>0.54</td>
</tr>
<tr>
<td>Leased land</td>
<td>0.08</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2.41</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table agricultural types inside and outside the park

<table>
<thead>
<tr>
<th>Land type</th>
<th>ha/household (A)</th>
<th>Number (total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garden</td>
<td>2.78</td>
<td>75</td>
</tr>
<tr>
<td>Paddy field</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Shrub</td>
<td>0.11</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>2.89</td>
<td>78</td>
</tr>
</tbody>
</table>

• In Village A, the proportion of main cultivated plants is 34% for cacao and 25% for coffee
• Coffee plantations adjacent to Village B are admitted

Historical changes of forest resource use in village A
Annual income of local people

<table>
<thead>
<tr>
<th>Income of Village A (Rp)</th>
<th>Proportion in Village A (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest products (inside the park)</td>
<td>22,222</td>
</tr>
<tr>
<td>Forest products and agricultural products (outside the park)</td>
<td>13,058,022</td>
</tr>
<tr>
<td>Timber</td>
<td>668,519</td>
</tr>
<tr>
<td>Coffee</td>
<td>2,705,852</td>
</tr>
<tr>
<td>Cocoa</td>
<td>2,317,500</td>
</tr>
<tr>
<td>Others</td>
<td>9,603,651</td>
</tr>
<tr>
<td>Livestock</td>
<td>2,614,815</td>
</tr>
<tr>
<td>Wage labor</td>
<td>1,255,370</td>
</tr>
<tr>
<td>inside the park</td>
<td>287,593</td>
</tr>
<tr>
<td>outside the park</td>
<td>967,777</td>
</tr>
<tr>
<td>Business</td>
<td>600,427</td>
</tr>
<tr>
<td>Supports (individual, public)</td>
<td>457,408</td>
</tr>
<tr>
<td>Loan</td>
<td>444,445</td>
</tr>
<tr>
<td>Others</td>
<td>2,028,518</td>
</tr>
<tr>
<td>Total</td>
<td>20,481,227</td>
</tr>
</tbody>
</table>

- In Village B, local people highly depend on coffee income
- Mixed coffee bean from inside and outside the park were sold
- Some coffee got Rainforest Alliance certification as coffee bean to export
- Coffee inside the park is mixed with coffee acquired Rainforest Alliance certification

Conclusion

- **Cultivation of coffee inside the national park may be allowed or other alternative income instead of coffee may be ensured**
  - High income from coffee especially in Village B

- **Possibilities of maximize to use lands outside the park for agricultural activities**
  - Introduction of the agricultural projects could achieve both forest conservation and local livelihoods
  - Rehabilitation of the previous areas of coffee plantations inside the park
Thank you
Dr. Pham Anh Cuong - Sustainable Practices and Management of Natural Resources through BBP in Hoang Lien National Park/AHP, Viet Nam

CONTENT

I. Overview on biodiversity of Hoang Lien NP/AHP

II. Biodiversity-Based Product Promotion in Hoang Lien NP/AHP

III. Sustainable management and conservation of biodiversity at Hoang Lien NP/AHP
I. Overview on Hoang Lien National Park/AHP

1. Overview on Hoang Lien National Park

- Hoang Lien National Park (HLNP) - significant SJF of Viet Nam, established as National Park since 2002
- 1,000 ~ 3,000 meters above sea level within Hoang Lien Son Range
- Total area: 95,904.97 ha distributed across 02 provinces (Lao Cai and Lai Chau)
- HLNP is recognized as 26th ASEAN Heritage Park in 2003

Fig 1. Map of Hoang Lien National Park/AHP
Biodiversity values in HLNP:

HLNP is one of the most biologically diverse centers in Vietnam, especially the forest flora.

- Flora: 1,847 species, 34 species listed in IUCN Red List, 66 species recorded in Vietnam’s Red Book
- Fauna: 86 species of mammals, of which 16 species are listed in Vietnam’s Red Book, 347 species of birds, 41 amphibians and 61 reptile species

- Hundreds of precious herbs: several ancient mushroom species distributed mainly in high mountain areas of China and Vietnam
- A wide range of traditional knowledge of various ethnic communities

2. Livelihoods of local people

- Total population of Hoang Lien AHP: 24,009 people in 39 villages of 06 communes
- 08 different ethnics people living in the core zone and buffer zone of HLNP
- Poverty rate accounted for 50.3% (2010)
- Some main difficulties: The life of Northern mountainous ethnic minorities is mainly based on the exploitation of natural resources such as logging, hunting wild animals. As population increases, the pressure to exploit, use and consume more resources; on the other hand, there is lack of cultivation land, low educational level, severe weather; lack of farming method, ...
II. Biodiversity-Based Products promotion at HLNP/AHP

1. BBP Project funded by GIZ at HLNP

Objective of BBP Project at Hoang Lien NP: Development of Medicinal bath value chain (VC) and Jiaogulan VC to improve livelihoods by creating increased income for local people and protection of biodiversity at Hoang Lien AHP, Vietnam.

- **Medicinal Bath:** Bathing with Herbs
- **GCL:** is used for high cholesterol, high blood pressure people and improving heart function.

### Medicinal bath
- **Indicators:**
  - 293 households are trained on sustainable *in-situ* and *ex-situ* growing and harvesting
  - 200 HH will have 10% increased income by end of the project (2018)
  - 2 Medicinal bath herb nurseries are established
  - Branding for Medicinal bath products under Vietnam Health Care Service standard

### Jiaogulan (GCL)
- **Indicators:**
  - 90 HH in will have 10% increased income, generated from the GCL growth
  - 80% of local women from HH are engaged in the GCL VC
  - 2 nursery gardens with approx. 30,000 seedlings/year are established.
2. Some outputs of the project

Jiaogulan Value Chain

Workshops and trainings
- 80 HH of 02 communes in HLNP buffer zone are informed about Project
- 02 training courses guiding planting, caring, processing and preserving GCL for 40 households
- 40 HH are engaged in pilot activities of VC in 7/2017

Knowledge exchange
- 12 selected households to visit, learn planting and processing GCL in Hoa Binh Province

Seedling
- 01 GCL seedling nursery with area is 400m2 in Sapa is set up and planted

Jiaogulan VC
2. Some outputs of the project

Medicinal Bath Value Chain

- 80 HH engaged in pilot activities of VC in 7/2017
- Partnership with 01 local company (named Hung Dung) in Sapa to carry out activities to enhance Bath Herb VC
- Identifying scientific name, value and use of 20 medicinal herb species by experts from Hanoi Forestry University
- 02 Bath herb seedling nurseries with 600m2 area are set up and produced

Medicinal Bath Value Chain
3. On-going activities forwards

- Farming 12 bath herb species in danger of extinction at nursery
- Developing Website to promote and marketing 2 BBP VC
- Strengthening monitoring and technical supporting case by case

III. Sustainable management and conservation of biodiversity at Hoang Lien NP/AHP
1. BBP promotion support in Sustainable management and conservation of biodiversity

- Reduce pressure on biodiversity and natural resources of National Park/AHP
- Generate sustainable livelihoods for local people
- Strengthening capacity for the Park Management Boards, staffs
- Public awareness raising for local communities on significance of biodiversity
- Reflect to policy on sustainable management and conservation of national legislation

THANK YOU FOR ATTENTION
Scientific Innovation and Research Agrobiodiversity:
Honey Bees Biodiversity

SIRIWAT WONGSIRI
Agriculture Interdisciplinary
Graduate School, Maejo University, Chiang Mai, Thailand

Abstract

The fanning behavior of three open nesting Apis species: A. florea, A. cerana, and A. dorsata, were observed in Thailand. The body postures of the fanner bees were observed in different parts of the combs. When the ambient temperature (T) was raised above the 29.5 °C, A. cerana started fanning whereas A. florea started fanning at 33 °C. Similarly, A. dorsata started fanning at 31.5 °C. A. cerana and A. dorsata began to fanning their nests earlier and stopped later than A. florea. The peak fanning time for A. cerana and A. florea was 11:30-13:30 h. min., whereas for A. dorsata was between 11:30-15:30 h. rain. The results indicated that the numbers of fanner bees fanning the nests were directly correlated with the ambient temperature and exposure of nests to the sun. A higher number of the fanner bees were observed on the south face of the nest rather than on the north face of the nests. During the nest fanning time, the fanner bees of A. cerana were kept their head downwards whereas A. florea fanner bees always kept their head upwards. Simultaneously, A. dorsata fanner bees were kept their head downwards. The solution of this behavior has different patterns in each species as well as in A. cerana and A. dorsata. The other behavior of those species to protect the broods from the rain water and lower temperature as well as the rain proof or wing umbrellas activity were observed and reported in this article. The last behavior diversity is found in A. dorsata which is a seasonally migratory species. In northern Thailand, swarms arrive in the dry season when flowers are blooming (November-April). During this period, they forage, store food and reproduce their members of the colony. Their foraging behavior plays an important role in the pollination of various economic crops and forest trees. Later, at the beginning of the rainy season, they migrate to a forest in which they survive until the next season. Nest sites are frequently reoccupied in subsequent seasons and it has recently been shown that the same individual colony can return to the same nest site year after year. This species has been reported to migrate up to 106 km in distance. Colony migration over long distances is not found in A. florea and A. cerana, but they seasonally abscond during death periods.
What is BIOLOGICAL DIVERSITY?

The term of “biological diversity” is commonly used to describe the number and variety of living organism on the planet. It is defined in terms of genes, species, and ecosystems which are the outcome of over 3,000 million years of evolution. The human species depends on biological diversity for its own survival. Thus, the term can be considered a synonym for “life on Earth”

Biological Diversity

Genetic Diversity
Species Diversity
Ecological Diversity
  Habitat diversity
  Behavior diversity
Species diversity of honeybees

1. *Apis andreniformis*
2. *A. florea*
3. *A. dorsata*
4. *A. laboriosa*
5. *A. mellifera*
6. *A. cerana*
7. *A. nigrocincta*
8. *A. koschevnikovi*
9. *A. nuluensis*
Biology of *Apis andreniformis*

Biology of *Apis florea*
Biology of *Apis dorsata*
Stingless Bee and The Nest
Entrance which is the propolis
By Using Drone Camera
Distribution of *A. florea*

Distribution of *A. dorsata*

Rutner, 1988
Karl von Firsch
Nobel prize in physiology, 1973
The Dance Language and Orientation of Bees

The round dance
Waggle for Direction & Distance
Cross-section view of the honey storage areas

Apis florea

Apis andreniformis
Comparison of cell sizes of *A. dorsata*, *A. florea* and *A. andreniformis*

<table>
<thead>
<tr>
<th>Cell size (cm.)</th>
<th><em>A. dorsata</em></th>
<th><em>A. florea</em></th>
<th><em>A. andreniformis</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Queen cell</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth</td>
<td>1.65 ± 0.23</td>
<td>1.41 ± 0.15</td>
<td>1.24 ± 0.26</td>
</tr>
<tr>
<td>Width</td>
<td>0.72 ± 0.17</td>
<td>0.47 ± 0.09</td>
<td>0.54 ± 0.08</td>
</tr>
<tr>
<td><strong>Worker cell</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth</td>
<td>1.55 ± 0.14</td>
<td>0.93 ± 0.07</td>
<td>0.76 ± 0.143</td>
</tr>
<tr>
<td>Width</td>
<td>0.55 ± 0.113</td>
<td>0.298 ± 0.15</td>
<td>0.278 ± 0.113</td>
</tr>
</tbody>
</table>
Mating behavior
Table 1. Levels of polyandry and intra-colonial genetic relationship in the genus *Apis* (revealed by microsatellite analysis)

<table>
<thead>
<tr>
<th>Species</th>
<th>Observed paternity frequency (Mean +SE)</th>
<th>Effective paternity frequency</th>
<th>Coefficient of relatedness</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>A. andreniformis</em></td>
<td>13.5±2.3</td>
<td>9.1±0.83</td>
<td>0.3±0.007</td>
<td>Oldroyd et al., 1997</td>
</tr>
<tr>
<td><em>A. florea</em></td>
<td>8.0±1.6</td>
<td>5.6±1.0</td>
<td>0.35±0.02</td>
<td>Oldroyd et al., 1995</td>
</tr>
<tr>
<td><em>A. florea</em> (revised)</td>
<td>16.0±1.1</td>
<td>9.3±1.0</td>
<td>0.31±0.006</td>
<td>Palmer and Oldroyd, submitted</td>
</tr>
<tr>
<td><em>A. cerana</em></td>
<td>18.0±3.03</td>
<td>12.0±1.6</td>
<td>0.29±0.005</td>
<td>Oldroyd et al., 1998</td>
</tr>
<tr>
<td><em>A. nigroaenea</em></td>
<td>54.0±5.8</td>
<td>40.4±11.79</td>
<td>0.27±0.004</td>
<td>Palmer et al, submitted</td>
</tr>
<tr>
<td><em>A. kacchoonikovi</em></td>
<td>16.3±10.5</td>
<td>10.5±8.4</td>
<td>0.31±0.03</td>
<td>Rinderer et al., 1999</td>
</tr>
<tr>
<td><em>A. mellifera</em></td>
<td>13.8±2.5</td>
<td>12.4±2.2</td>
<td>0.30±0.009</td>
<td>Estoup et al., 1994</td>
</tr>
<tr>
<td><em>A. dorsata</em></td>
<td>30.1±6.00</td>
<td>25.6±1.05</td>
<td>0.27±0.02</td>
<td>Moritz et al., 1995</td>
</tr>
<tr>
<td><em>A. dorsata</em></td>
<td>26.7±6.6</td>
<td>20.0±5.6</td>
<td>0.29±0.007</td>
<td>Oldroyd et al., 1996</td>
</tr>
</tbody>
</table>

Level of polyandry in *A. dorsata* (revised by Wattanachaiyingcharoen, 2001).

- The effective mating frequency ranged between 26.9 and 88.5.
- The mean effective mating frequency of aggregation was 64.11±7.388 (SE).
- The mean effective mating frequency of single colonies was 62.14±10.269 (SE).
Worker policing

- *Apis mellifera*
- *Apis cerana*
- *Apis florea*

Worker policing and worker reproduction in *Apis cerana*

Benjamin P. Oldroyd · Luke A. Halling
Gregory Good · Wandee Watanachaiyongcharoen
Andrew B. Barron · Piyamas Nanork
Siriwat Wongsiri · Francis L. W. Ratnieks

**Abstract** Workers of the Asian hive bee, *Apis cerana*, are shown to have relatively high rates of worker ovary activation. In colonies with an active queen and brood nest, 1–5% of workers have eggs in their ovarioles. When *A. cerana* colonies are dequeened, workers rapidly activate their ovaries. After 4 days 15% have activated ovaries and after 6 days, 40%. *A cerana* police worker-laid eggs in the same way that *A. florea* and *A. mellifera* do, but are perhaps slightly more tolerant of worker-laid eggs than the other species. Nevertheless, no worker’s sons were detected in a sample of 652 pupal males sampled from 4 queenright colonies. *A cerana* continue to police worker-laid eggs, even after worker oviposition has commenced in a queenless colony.
Worker policing in the bee *Apis florea*

Luke A. Halling · Benjamin P. Oldroyd
Wanadee Wattanachaiyingcharoen · Andrew B. Barron
Piyamas Nanork · Siriwat Wongsiri

**Abstract** *Apis florea* is a single-combed, open-nesting, dwarf honeybee indigenous to Asia. In common with other species of this genus, *A. florea* is highly polyandrous, and is therefore predicted to curtail worker reproduction by mutual policing mechanisms that keep worker reproduction at an extremely low level. Policing mechanisms could involve destruction of workers’ eggs or offspring, or aggression toward those workers that are reproductively active. We show that in *A. florea*, worker-laid eggs are eliminated approximately twice as fast as queen-laid eggs, indicating that *A. florea* uses oophagy of worker-laid eggs as a mechanism of worker policing. Genetic analysis of four colonies indicated that all males produced were sons of queens, not workers. Dissections of 800 workers, from four colonies, did not reveal any significant levels of ovary activation. These results suggest that worker policing is an effective component of the mechanisms that maintain worker sterility in this species. Furthermore, they suggest that worker policing via oophagy of worker-laid eggs is pleiomorphic for the genus.

---

**Pheromones**
Morphometric study of *A. cerana* in Thailand was studied by Sylvester *et al.* (1998)

- north, north-east, and central Thailand
- peninsular Thailand
- Samui Island
- Phuket Island

**Molecular study**

To detect genetic variability and population structure of honey bees in Thailand revealed by molecular markers such as mitochondrial DNA, microsatellite and DNA sequencing.
Mitochondrial DNA of honey bee, *A. mellifera* (Crozier and Crozier, 1993)

---

Genetic variation studies of *A. cerana* in Thailand

- Deowanish *et al.* (1996)
- Pootong (1998)
- Sihanuntavong *et al.* (1999)
- Sittipranee *et al.* (2001)

In summary *A. cerana* in Thailand could be divided into 3 groups; northern Thailand, southern Thailand, and Samui Island.
Conclusion

Biodiversity
  Species Diversity
  Behavior Diversity

Bio-Informatics
  Morphometrics
  Bee Nest Architecture

Molecular Biology
  Mitochondrial DNA
  Microsatellite DNA
  DNA sequencing
Acknowledgements

We are grateful to The National Science and Technology Development Agency of Thailand for financial support (grant number CO-B-07-22-09-005), and Roy Biology Research Unit.

This study was conducted in co-operations with the USDA, ARS, Honey-Bee Breeding, Genetic and Physiology Laboratory, U.S.A, and the School of Biological Sciences, University of Sydney, Australia.

Thank you
Atty. Edna N. Maguigad - Promotion of traditional ecological knowledge and sustainable use of non-timber forest resources for sustainable forest management, livelihoods, food and nutrition
Our work

Community-based conservation
Through forest management and sustainable harvesting of NTFPs to emphasize the forests’ intrinsic relationship with the culture and livelihood of indigenous peoples;

Tenure rights and governance
The recognition and enforcement of user rights through legal measures and policy advocacy, constituency building, ensuring enabling environments in which various sectors are in support of indigenous land rights and their NTFP enterprises;

Indigenous food and health
Through the enhancement of subsistence uses of NTFPs, and promotion of indigenous peoples’ culture and traditional ecological knowledge;

Sustainable community livelihood
From value addition and marketing of NTFPs, using the low volume, high value approach;

Gender and Culture

What are NTFPs?
Traditional Ecological Knowledge promotes sustainable forest management and livelihoods
Shifting cultivation, abaca, cinnamon, almaciga, and honey

Effective approaches and interventions
Women take the center stage
Natural dyes and women entrepreneurship

Women as purveyors of knowledge
Forest food and

Market based innovations that support and promote TEK and participatory process – case of sustainable rattan and the Participatory Guarantee System (PGS) in Indonesia

Platforms and Partnerships
Challenges
Lessons Learned
What are NTFPs?

- “all biological materials, other than timber, which are extracted from forests for human use”

- Rattan, plant fiber, forest fruits, crafts, honey, resins, gums, medicinal plants, etc.

Traditional Ecological Knowledge promotes sustainable forest management and supports livelihoods

- Shifting cultivation
- Hinabol and T’nalak from Abaca (Musa textilis)
- Cinnamon and Dao people of Vietnam (Source: CSDM, Vietnam
- Ainarica harvesting in Palawan, Philippines
Effective interventions and approaches

**HONEY**
*Apis dorsata*

NTFP enterprises that promote ecosystem integrity and preserve biodiversity

**ABACA**
*Musa textilis*

NTFP enterprises that restore timeless traditions
Effective interventions and approaches

**ALMACIGA**

*Agathis philippinensis*
syn. *A. dammara*

NTFP enterprises that uphold traditional governance

---

Effective interventions and approaches

**ICCAs**

*Territories and areas conserved by indigenous peoples and local communities*

Indigenous people’s led community conservation in India
Effective interventions and approaches

Capacity building

Women’s Math classes to help illiterate women to read and calculate numbers so that they can properly calculate when selling products, Vuen Sai district, Cambodia, 2013

EXCEED Training: Women Entrepreneurship in Rural Asia, September 2017, Indonesia

participatory resource monitoring

Women take the center stage: Case of Natural Dyes
Women as purveyors of knowledge
Cases of crafts and food from the forests

Market based innovations that support and promote TEK and participatory process
Rotan Lestari (Sustainable rattan)
Participatory Guarantee System (PGS) in Indonesia

- Rattan has long been known as an important NTFP with great potential in Indonesia
- Rattan production at community level has declined over the years due to lack of policies that support rattan farmers
- There is a growing movement to use green products
- Through certification: opportunity to provide added value to rattan farmers and at the same time promote the processing and the sustainable management of rattan
• PGS Rattan pilot testing in Eheng Village, East Kalimantan
  Submitted to World Forestry Congress –
  Durban, Sept 2015

• PGS Rattan pilot testing in Nambo Village, Central Sulawesi
  Media coverage: Metro TV, Media Indonesia, Mongabay, local
  newspapers

Platforms and Partnerships

- Pastor Rice Small Grants Fund
- GAGGA: Global Alliance for Green and Gender Action
- EXCEED: The NTFP Academy
- ASEAN Social Forestry Network
- IUCN
Challenges to working on NTFPs

- Tenurial security
- Policies that are unfavorable and are endangering local livelihood, and sustainable resource management practices and traditions;
- Access to resources - NTFP Permitting processes and other restrictive policies
- Reduced support due to less resources available and shifts in priorities
- Unsustainable practices
- Resource extractive industries
- Product development and marketing

Challenges to working on NTFPs

- Involving indigenous youth in leadership and conservation issues
- Sustaining community interest particularly when a project finishes
- In passing on traditions, particularly with influence of mainstream or outside culture, including migration
Lessons Learned

• Working with communities towards an optimal use and management of NTFP resources can achieve sustainable forest management, it also provide a strong incentive for involvement in forest conservation
• Increasing the value of NTFPs can fight poverty, and provide sustainable livelihood and promote well-being of forest dwellers.

Lessons Learned

• In forest dependent communities, healthy and well managed forests become enabling environments for women to perform their roles as leaders
• Community organizing is essential, build foundation of the organization around community values, aspirations, and practice and adapt the governance arrangement
Thank you!
Terrain of Outcomes Sought

Agrobiodiversity

• Part of biological diversity that is important to food and agriculture
• The human element – sets agrobiodiversity apart from ‘wild’ biodiversity
• Outcome of interactions among genetic resources, environment and farmers’ management systems and practices
• Results from both natural selection and human intervention over millennia
ISARD
Inclusive and Sustainable Agricultural and Rural Development

- Engaging multiple stakeholders toward improving the well-being of the rural poor
- Improving:
  - natural resource-based livelihoods
  - supportive systems and institutions toward food and nutrition security of majority beyond present generations
- Social Inclusion, Environmental Sustainability, and Institutions and Governance as domains

Inclusive Agribusiness:
Agricultural Transformation and Market Integration

- Importance of agricultural development in the larger development strategy
- Smallholders: from peasant farming to commercial farming – farmers as aspiring entrepreneurs with the capacity to manage natural resources, plants and animals, technology, and markets safely and profitably
- Stronger relationships between smallholders and agribusinesses that link them to local, regional, and global value chains
CBNRM and CCAM
Community-based Natural Resource Management
Climate Change Adaptation and Mitigation

- Creates the right incentives and conditions for a local community to be resilient and use natural resources sustainably
- Resource users benefit (economically) from resource management
- Partnerships are established with outside agencies and other villages in the vicinity, as the local community is not the only stakeholder
- Policymakers, researchers and development workers collaborate with the local community in identifying the resources, assessing vulnerabilities, and developing plans for CC adaptation/mitigation and to sustainably improve the area and livelihood of the people in a participatory approach
- Promotes conservation through the sustainable use of natural resources
Reviewing Extension, Communication, and Education, for Agrobiodiversity

Extension and Rural Advisory Services (ERAS) (Habito et al., 2017)

- Greater investment in ERAS leads to productivity growth (Suphanachart and Warr, 2011 and Alston et al., 2011)
- Traditional supply-driven extension fraught with limitations: weak links with R&D, little institutional learning and feedback mechanisms, limited opportunity for innovative research, weak M&E, diverted services
Extension and Rural Advisory Services (ERAS) (Habito et al., 2017)

- Since 1990s, demand-driven, private sector/CSO-led – central focus on farmers in a participatory system, e.g., FFS, F2F approaches, cooperative and commercial extension
- Successful models include agrochemical companies that provide free advice and freebies with products bought; and CSOs that equip farmers with knowhow on GAP as certified for European markets; but have disadvantages too

Facilitating Innovation Platforms through Participatory Development Communication (PDC)
PDC (Bessette 2004)

1. Establishing a relationship with a local com'ty
2. Involving the com'ty to identify problem
3. Identifying the stakeholders
4. Identifying comm. needs, objectives & activities.
5. Identifying appropriate comm. tools
6. Preparing & pre-testing comm. content & materials
7. Facilitating the building of partnerships
8. Producing an implementation plan
9. Monitoring, documentation & evaluation
10. Sharing & facilitating the utilization of results

FACILITATING PARTICIPATION THROUGH COMMUNICATION

The PDC model integrated with the research for development process

---DIAGNOSIS---

1. Developing a relationship / understanding local setting
2. Working with the com'ty to id problem
3. Identifying the stakeholders
4. Identifying comm. needs, objectives & activities.
5. Identifying appropriate comm. tools
6. Preparing & pre-testing comm. content & materials
7. Facilitating the building of partnerships
8. Producing an implementation plan
9. Monitoring, documentation & evaluation
10. Sharing & facilitating the utilization of results

---ASSESSMENT---

---INTervention / EXPERIMENTATION---

---PLANNING---

267
Adaptive learning embedded in action-reflection cycles

eAgriculture:
The Promise of Low-cost, Demand-driven ICT
The Problem

Farmer-extension-research linkages failures at scale

Poor reach and ineffective provision and financing of extension services

Poor knowledge and information access

Low and slow adoption of good technologies

Yields Gap and Market Gaps

From Noel Magor, 2016 based on Paula Ficarelli, 2015

ICTs: A solution for reaching many and better

Scalable
Scalable and tailored to the context-specific demands

Faster
Reduced delivery time

Cheaper
Lower-cost per dissemination

Cost-effective information and advisory provide farmers access to services; cost-savings and climate-smart technologies; at scale leading to sustainable productivity increases; and contributing to poverty reduction

From Noel Magor, 2016 citing Paula Ficarelli, 2015
Lessons Learned with ICT

Key messages on ICT:
- Do not work on their own
- Require intermediation and intermediaries

BUT:
- Can be enablers for more effective project results
- Can change the way agricultural knowledge is accessed and disseminated

From Noel Magor, 2015 citing Paulo Ficarelli and Poomima Sanikar, 2016

The eAgriculture Umbrella

Knowledge Repositories
- MOOCs
- mLearning
- Virtual Academies
- Global Repositories
- Agropedia

E-learning
- Remote sensing
- GIS
- Sensors
- Drones

Intelligent Agriculture
- Agro-advisory
- Farmer to Farmer
- Farmer to Expert

mAgriculture
- Trade facilitation
- Commodity Prices
- Buyer – Seller Logistics

Market services
- Mobile banking
- Insurance

Financial services
- Data mgt.
- Data collection
- Monitoring

eAgriculture spectrum delivering services through ICT

From Noel Magor, 2016

SEARCA
Agrobiodiversity Education

- An analysis of knowledge and skills required to equip a new cadre of researchers, development experts, policy specialists and teachers to carry out multidisciplinary research and development interventions on agricultural biodiversity
- Involved a series of surveys, expert consultations and dialogue with key players in both agricultural research organizations and universities
Agribiodiversity Education

Teaching agrobiodiversity: a curriculum guide for higher education

Take home: Approaching ECEA in SEA
Advancing Agrobiodiversity

- Advances inclusive and sustainable rural livelihood, food and nutrition security, resiliency, holistic development
- Builds capacities
- Invests in extension that offers accessible and timely demand-driven options
- Applies PDC in facilitating innovation platforms
- Navigates promises and limits of ICT
- Mainstreams agrobiodiversity via education

Mapping the Prospective Agrobiodiversity Community
Modalities for Knowledge Management and Capacity Building

Regional Platform
Regional meetings/fora/seminars, Web portal and social media, publications, AVs, etc.

National Platform
National meetings/fora, Web portals and social media, National media, Publications, AVs, etc.

Subnational Platform
Subnational meetings, Mobile phone sms & calls, Memos, Photos, Social Media, Seminars, Publications, Audiovisuals, Radio, etc.

Local Platform: Rural Communities and Orgs
Mentoring, Meetings, Mobile phone sms & calls, Memos, Photos, Social Media

References


References


http://www.agrobiodiversity.org/about


References

SEARCA. 2014. Advancing Inclusive and Sustainable Agricultural and Rural Development in Southeast Asia. ISARD Prospectus/brief. 2 p

Magor N. 2016. ICT Applications in Agriculture. Presented at SEARCA Third Executive Forum on Food Security: Leaders in ASEAN Agriculture and Development 6-10 June 2016 at SEARCA, College, Los Baños, Laguna, Philippines (Drawing on resources of Paolo Picarello and Poomima Sankar (ICT overview and several case studies), Roland Buresh (Rice Crop Manager), Rikin Gandhi (Digital Green), Paul Van Mele (Access Agriculture), and Bryce Blackman, Laura Atienza, Jerome Cayton Barradas (Rice Knowledge Bank and Rice Doctor))

References


Ms. Deeppa Ravindran - Crucial Link between gender, capacity building and local knowledge systems and its relevance to sustainable development
Women in agriculture, environment and rural production around the world

UN ESCAP – 58% of women in Asia Pacific are involved in agriculture, 2017

Portugal - 50%
West Africa - to 80%
Cambodia - 95%
Vietnam - 53%
Philippines - 47%
India - 55% to 65%

Source: FAO, 2007 and UN ESCAP, 2017

Women and Pesticide Exposure

- There are gender differences in pesticide use, exposures, health outcomes and environmental impacts.

- For example, women may be at greater risk of adverse effects from pesticides partly because of:
  - lower literacy rates
  - limited access to training and
  - to personal protective equipment (Jors et al. 2013, Naidoo et al. 2010).

- In Indonesia women carry out the bulk of spraying on oil palm plantations in Kalimantan, using highly hazardous pesticides under unsafe conditions (e.g. leaking backpack sprayers and lack of personal protective equipment) for very low wages.

Source: Global Gender and Environment Outlook, 2016. UNEP.
Realities on the ground

On Keo Wa, 25, carries her 9-month-old baby while working at a banana plantation operated by a Chinese company in the province of Bokeo in Laos April 24, 2017. REUTERS/Jorge Silva
How do we involve women?

- Motivating women to be involved and sharing information
- Women representing themselves
- Organizing special events and include men
- Developing autonomous women's groups
- Breaking down barriers and creating access to information
- Creating policy
- Recognizing women's role in struggle

Farm is alive with diversity in Laos
Why agroecology?

- Socially
- Increased Yields 79%
  - yield increase across a wide variety of systems and crop types in Africa
- Economically
- Environmental

Increased profit
- India, Andhra Pradesh: Organic vs Conventional crop profitability
  - Paddy: 37% vs 33%
  - Red gram: 59% vs

Cambodia - comparison between organic and conventional nation wide yields

UN experts support Agroecology

"Agroecological farming can help secure livelihoods for smallholder farmers and those living in poverty, including women, because there is no heavy reliance on expensive external inputs.

If properly managed, biodiversity and efficient use of resources can enable smallholder farms to be more productive per hectare than large industrial farms."

Special Rapporteur on the right to food, pursuant to Council resolutions & Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes.
Leadership Training for Women

Figure 1: A young farmer doing rice breeding (Picture courtesy of MASIPAG)
Sustainable Agriculture & Environment Development Association (SAEDA), Laos

"I noticed that my neighbours were falling sick and so was I after spraying pesticides. I was poisoned by pesticides on a continuous basis, and I have been spraying since I was 18.

Now I am part of an organic network of farmers (OFA) and have stopped using pesticides 10 years ago.

I feel healthier and I also have better income." Kham Keng a member of OFA Laos.

Kham Keng is now a trainer in her community.

Achievements - Cambodian Center for Study and Development in Agriculture (CEDAC), Cambodia

"Previously spraying pesticides was a habit for me. It took me seven years to fully convert to organic farming and now I will not turn back.

I am concerned about the impacts of pesticides on children so I have convinced others to join me.

My neighbours said that being an organic farmer is hard work, but I tell them it is possible when we work together."

Nhem Sovanny, winner of the SRI Award organized by CEDAC (Cambodian Center for Study and Development in Agriculture)
Success stories of Women Agroecology Champions

Gender Heroes: from grassroots to global action

http://www.panap.net/sites/default/files/Stories-From-The-Field.pdf


Agroecology champions in Asia

CAMBODIA
CEDAC works with 149,000 farmer families and 56,000 practice SRI and organic rice

India
• LIESA works with 40,000 farmers in Tamilnadu practicing agroecology

Philippines
MASIPAG-35,000 farmers, 200 farmer trainers, 65 farmer rice breeders
Recommendations/ Conclusion

- **Meaningful participation**: Gender equality cannot be measured by women’s and men’s “presence” alone.

- **Business-as-usual approaches** are not working. Instead, they are proving disastrous for people and the planet alike. Gender-and-environment approaches are integral to a sustainable and just future.

- **Enact policies to support farmers** moving away from highly hazardous pesticides and replacing with agroecological alternatives.

- **Use international conventions**, i.e., Stockholm and Rotterdam, to stop/deter trade of HHPs listed in the conventions.

- **Seek cooperation with pesticide-manufacturing countries aimed at respecting pesticide regulations, including bans, of countries in the region**

More case studies and reports available at :-

[www.panap.net](http://www.panap.net)
OBJECTIVES

○ To identify opportunities for strategic cooperation on agrobiodiversity vis-a-vis the relevant global and regional frameworks and targets on sustainable development, biodiversity conservation, food security, and climate change resilience.

○ To identify action points/elements towards an action plan on agrobiodiversity in Southeast Asia (ASEAN Action Plan on Agrobiodiversity)
KEY AREAS FOR DISCUSSION

- Assessment
- Innovations and Best Practices
- Capacity Building
- Mainstreaming

Expected Output

List of identified action and rationale for each:

<table>
<thead>
<tr>
<th>IDENTIFIED ACTION</th>
<th>WHY</th>
</tr>
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<td></td>
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</tbody>
</table>
* 
  o Select a Group Chairperson 
  o Select a Rapporteur 
  o Time allotted: 2 hours 
  o Presentation of group output: Bus Stop
Asia Indigenous Peoples Fact (AIPP)

- Regional organization founded in 1988 by indigenous peoples’ movements
- AIPP together with its members is promoting and defending the rights of indigenous peoples
- AIPP has 48 members from 14 countries in Asia
- Secretariat is based in Chiang Mai

Lands and Indigenous Peoples

- Asia is home to at least 260 million indigenous peoples
- Indigenous peoples are the guardians of our forests, rivers, seas, hills and mountains. These are very important for indigenous peoples, socially, culturally and spiritually.
- Indigenous peoples’ territories in the world occupy 80% of the planet’s biodiversity.
- We get everything from our lands (food, medicines, water, vegetables, meat, classroom...
Sufficiency and Sustainable

1. Shifting Cultivation/Rotational Agriculture

- Traditional resource management system:
  (Do not do farming in the watershed area. Do not cut big tree)
- Fallow cycle of 6-10 years (Soil and nutrient restoration)
- NO Chemical is used. Instead they plant different plants to attract other insect to get rid of another species.
- Variety of crops and animal (more than 100 species of plant and around 85 species of animal/insects. [Link](http://abc-sm.org/2015/1699/))

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1. Shifting Cultivation/Rotational Agriculture

- Hin Lad Nai village (Karen community) is recognized as a model village by the govt. where community practices sustainable rotational agriculture. (Community forest 3119.68 hectares, agriculture land 567.52 hectares)
- In Hin Lad Nai, 90 varieties of vegetables can be found in the shifting cultivation area.
- The study done in Hin Lad Nai has shown that the carbon sequestration by shifting cultivation during fallow period (6-10 years) by far exceeds the carbon emission during burning.

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[Diagram of Carbon Sequestration Areas]

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293
2. Customary Forest Management

• Millions of indigenous peoples in Asia are sustainably managing and protecting their natural resources including forests (zoning area, patrolling, firebreak, ritual etc).
• For example, at least 40 million hectares of customary forests are managed by indigenous peoples in Indonesia.
• These customary forests are helping to purify the polluted atmosphere by sequestering carbon-dioxide.

De Por forest (umbilical cord forest)

• Healthy Tree
• Can bear fruit (food for animal and human beings)
• Provide shelter
• Not allow to cut the tree and a person need to take care of that tree
Challenges: Grabbing of Indigenous Peoples’ Lands for:

- Mining
- Mega Dams
- Logging
- Industrial plantations

Actions by AIPP:

- Capacity building of indigenous peoples’ organizations, for example on indigenous peoples’ rights and community mapping, among others
- Indigenous peoples’ organizations are using community mapping as a tool to fight against land grabbing (Thailand, Malaysia, Indonesia, Cambodia, Philippines, India, Myanmar)
- Policy advocacy and dialogue with government and UN agencies (for example; AIPP organized dialogue between knowledge holders, government and FAO on shifting cultivation in 2015)
- Documentation and promotion of the good practices of indigenous peoples
- Facilitate ground experiences and voices in the regional and international processes and mechanisms
- AIPP is the regional focal point for the Global Campaign on Land Rights
Indigenous Peoples Movement

We call for Land Rights Now

www.landrightsonw.org

RECOGNIZE OUR TRADITIONAL KNOWLEDGE!

PROTECT OUR NATURAL RESOURCES AND OUR PEOPLES!

RESPECT AND PROMOTE INDIGENOUS PEOPLES’ COLLECTIVE LAND RIGHTS
THE PROGRAM OF WORK

• Decision III / 11 – November 1996 – Crafted the PoW
  – promote the positive effects and mitigate the negative impacts of agricultural systems and practices on biodiversity in agro-ecosystems and their interface with other ecosystems;
  – promote the conservation and sustainable use of genetic resources of actual and potential value for food and agriculture;
  – promote the fair and equitable sharing of benefits arising out of the use of genetic resources.
PROGRAM OF WORK ON AGRICULTURAL BIODIVERSITY

Based on 4 Mutually Reinforcing Elements:

• **Assessments**: to provide an overview of the status and trends of the world's agricultural biodiversity, their underlying causes, and knowledge of management practices.

• **Innovations and Good Practices (Adaptive Management)**: to identify innovations & good practices (adaptive management), technologies and policies that promote the positive effects and mitigate the negative impacts of agriculture on biodiversity, and enhance productivity and the capacity to sustain livelihoods, by expanding knowledge, understanding and awareness of the multiple goods and services provided by the different levels and functions of agricultural biodiversity.

PROGRAM OF WORK ON AGRICULTURAL BIODIVERSITY

Based on 4 Mutually Reinforcing Elements:

• **Capacity Building**: to strengthen the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage agricultural biodiversity sustainably so as to increase their benefits, and to promote awareness and responsible action.

• **Mainstreaming**: to support the development of national plans and strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration in sectoral and cross-sectoral plans and programmes.
The PoW also addresses the following:

- Conservation and Sustainable Use of Pollinators
- Conservation and Sustainable Use of Soil Biodiversity
- Biodiversity for Food & Nutrition
- Genetic Use Restriction Technologies (GURTs)

https://www.cbd.int/agro/
Mr. Michael Victor - Integrating Agro-Biodiversity in Upland Development from policy to practice
Agrobiodiversity is Uniquely Lao

- Identified as mega-biodiverse country
- At the heart of Lao people: food, culture, natural heritage
- Builds upon the strengths of Lao farmers and what they have been producing already
- A way to build Lao products
- Support developing a healthy, resilient and sustainable food system in Laos
- Bridging together generations

Wealth of Agro-Biodiversity

**Table 1: Estimate of Lao agro-biodiversity resources**

<table>
<thead>
<tr>
<th>Organism</th>
<th>Wild (used)</th>
<th>Gen-plasm (gene bank)</th>
<th>Cultivated</th>
<th>Raised (animals)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Species</td>
<td>Varieties/land races</td>
</tr>
<tr>
<td>Plants</td>
<td>2,500*</td>
<td>17,000</td>
<td>135*</td>
<td>180*</td>
</tr>
<tr>
<td>Rice</td>
<td></td>
<td>14,500</td>
<td>1*</td>
<td>30*</td>
</tr>
<tr>
<td>Non rice crops</td>
<td>50*</td>
<td>2,500</td>
<td>100*</td>
<td>150*</td>
</tr>
<tr>
<td>NTFP**</td>
<td>500*</td>
<td>-</td>
<td>14*</td>
<td>-</td>
</tr>
<tr>
<td>Medicinal plants</td>
<td>1,700</td>
<td>-</td>
<td>20*</td>
<td>-</td>
</tr>
<tr>
<td>Animals</td>
<td>800*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Livestock</td>
<td>-</td>
<td>?</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Insects, etc.</td>
<td>100*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fish &amp; Aquatic</td>
<td>200*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Macro fungi</td>
<td>100*</td>
<td>-</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>3,400*</td>
<td>17,000</td>
<td>140*</td>
<td>180*</td>
</tr>
</tbody>
</table>

*: Estimate by ABP. **: Excluding medicinal plants and macro fungi.
How ABD fits into other policies

- CBD
- NBSAP
- NABP II
- NAFRI Research Strategy
- Climate Change Strategy
- Upland Development Strategy
- National Environment Management Strategy
- Agriculture Development Strategy
- Agricultural Strategic Vision

Lao Policy in relation to ABD

- Lao Agriculture Development Strategy:
  - Promoting Lao niche market products (i.e. ABD Products)
  - Sustainable intensification and diversification
  - Sustainable management of natural resources and increased forest cover
  - Supporting small holder farmers

- National Agro-Biodiversity Action Plan (2016)
  - An enabling policy environment and legal framework
  - Organizational and technical capacity
  - Floral, faunal, fungal and other elements are effectively managed, utilized and conserved.

Challenge: we can make NBSAP, NABDPAP but needs to be mainstreamed in Climate change, Nutrition Sensitive Agriculture
AgroBiodiversity – one of the main working groups of Donor-Government Round Table

Agro-Biodiversity and Sustainable Food systems – two competing visions

Imported, processed, mass produced, low nutritional value food

Leads to high input mono-cropping
ABD Hypothesis

Agro-biodiversity based development with a focus on multifunctional landscapes offers a more viable alternative to improve upland livelihoods and food security than large scale mono-culture cropping systems.

The Agro-Biodiversity Initiative (TABI)

- 10 year collaboration between MAF and SDC
- Supporting MAF strategy for ABD Development
- Work in 3+1 Provinces in North – more than 250 villages
- Major results:
  - More than 25 ABD livelihood options tested benefitting more than 34,000 families
  - FALUPAM carried out in more than 225 Villages – more than 750,000 ha managed under FALUPAM
  - Phase 3: 2017-2020 – focus is on scaling out, institutionalization and capitalization
TABI is an initiative

- Initiative working with multiple partners and government agencies – cross sector – multi-disciplinary

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Integrating ABD into Uplands development

- The Uplands of Lao PDR has the most social and ecological diversity in the country
- Diversity comes from shifting cultivation though long been viewed as the "culprit for poverty and resource degradation"
- Still despite policies and commercialization incentives remain primary upland agriculture practice
- TABI testing out approach to stabilize land use by recognizing upland rice cropping and village forestry as crucial component in Upland Development
Upland Rice is “still” the main cash crop in many upland villages

Source of income in 11 upland villages in Phonxay and Phoukoud district

Source: TABI survey 2012

Bush Fallows are an crucial element of multifunctional landscapes

Where are NTFP are collected?

Based on survey in 100 villages in Phonexay, Chomphet and Phoukoud district

Source: TABI baseline 2012
TABI Process for integrating ABD into Uplands Development

- Land use planning
  - Recognizing current land use
  - Consolidating shifting cultivation
  - Planning and tenure security

- Identify potentials for intensification and diversification
  - HYPA
  - Agriculture, livestock, agroforestry systems
  - Livestock systems

- Development of small/medium enterprises and markets

- Policy dialogue
  - Evidence-based research
  - Knowledge management

Participatory Forest and Ag Land Use Planning bottom up approach

- Process carried out in 4 steps:
  1. Introducing/organizing/mapping village boundaries
  2. Mapping Current Land use
  3. Mapping Future Land use
  4. Hand over of village report signed by district and monitoring and evaluation

- Focuses on recognizing actual land use and shifting cultivation rotations

- Farmers receive tenure in exchange for stabilizing system

- Farmers and Government find this process more effective for:
  - Delineating boundaries
  - Getting villagers agree on land use change
  - Understanding what farmers are currently doing
3.1: Example of stabilised upland cropping: Huay Jia Village, Pongsai District, Luang Prabang Province.
Livelihood options for range of Agro-ecological Zones

- Upland Rice/Cropping
- Village Forestry
- Lowland rice
- Riverine
- On-farm livestock Systems

Example 1: Bamboo – Village Forestry

- Bamboo is a product that grows prodigiously in shifting cultivation fallsows.
- A number of species and products:
  - Food
  - Medicines
  - Construction
- TABI working on:
  - Village forest management
  - Bottling/packaging
  - Domestication and conservation
Example 2: Agroforestry Systems

A number of agroforestry systems have been tested
- Coffee and Fruit trees
- Tea
- Cardamom
- Broom grass
- Teak
- Yang (benzoin)

- Main constraints are access to markets for small holders and policy incentives

Example 3: emerging small enterprises
Example 4: Fish Conservation Zones

Fish Conservation Zones
Established more than 200 in three provinces
• To rejuvenate and manage aquatic Agro-Biodiversity.
• To increase the food and nutrition resources for villages.
• To increase, or maintain, the income from fisheries.
• To rejuvenate indigenous fish species and preserve those that are facing extinction.
• To improve villagers understanding and participation in improving management of local fish species and resources.

Example of potential

<table>
<thead>
<tr>
<th>Province</th>
<th>No of FCZs</th>
<th>KG caught</th>
<th>KG sold</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houaphanh</td>
<td>4 villages</td>
<td>1,206</td>
<td>866</td>
<td>4590USD</td>
</tr>
<tr>
<td>Luang Prabang</td>
<td>6 Villages</td>
<td>817</td>
<td>2,357</td>
<td>9900 USD</td>
</tr>
</tbody>
</table>

More than 100 species of fish identified

And many more potentials.
Example 5: Local ABD Curriculum

Lao Agro-Biodiversity Knowledge Sharing Platform (LARP)
- NAFRI, under the SSWG-ABD developing web-based platform to capture knowledge and link new and old generations

Value Added
- Provide a one-stop shop for information on ABD to range of stakeholders
- Repackage already existing information in formats that can be used by different actors
- Ensure local knowledge on ABD is documented and not lost
- Link Lao information to global datasets and knowledge
- Tap into and promote increasing interest in Lao food and products
Knowledge Base

Core Components

- Core ABD species and product profiles
- Experts and practices
- Landscapes and systems
- Policy information

Conclusions

- Build upon what farmers are already doing – build trust and recognize current land use
- Identify approaches for diversification and intensification of systems (uplands, household, lowlands).
  - A lot can be done that doesn’t necessarily need a lot of inputs
- Policy at national and local level is important
- Provide incentives for farmers to test out and apply more resilient systems than monocropping – tax breaks, access to credit, land security
- Link to emerging markets – new ‘food system’ of healthy clean living and communicate/capture rich knowledge
  - Challenge is how to scale – market and supply side, quality, standards, etc
Thank you
Rural Ecological Agriculture for Livelihood (REAL) Purposes

- Create awareness on the importance of the Agrobiodiversity and promote sustainable conservation and utilization
- Create awareness on the impacts of pesticides to health and environment and promote reduction of pesticides uses
- Build capacity for institutions on ecological agricultural practices/ IPM/ SRI, and etc.
What is the ABD?

Beneficial Predators, Parasites, Pollinators And Soil Builders (Ecological Services)

ABD products are important sources for materials and income
The value of ABD

Lao PDR, 2014

Farmland Bio Diversity Functional Groups

Income
Supply of food
Materials
Medicine
Social/cultural value
Esthetical value
Where are the farmland biodiversity?

```
Biodiversity of farmscapes in the wet and dry seasons
```

```
Where do the rural communities find their foods?
```

```
Riparian ecosystems are important sources of ABD food
```
Status of ABD

Factors contributed to the declining of ABD include:

- Expansion of farmland and urban
- Agricultural practices
- Pesticides
- Over harvested/collected/used & no maintenance
- Extreme weather conditions/Climate change
- ???

Threats to the ABD
Children are the future of ABD resources: Are they ready??

Community Meeting

- Community members, teachers, students, religious leader, local administration and agencies (Stakeholders)

➤ Assess understanding and interests
➤ Mobilize BD task force
Identify habitats and survey map

• Investigate habitats
• Develop map and survey plan

➢ Community Farmland BD Map

ABD Survey

• Conduct the baseline survey to document the status of the ABD in the community
Document the status of the ABD as baseline for planning and tracking

Community ABD Action Plan

- Species selection and priorities
- Preservation area(s) and domestication
- Strategies and agreements for protection and sustainable utilization
- Action plan and proposal for supports
Pesticides impacts to health and environment

- Brand name & common name
- Type & toxic level (Ia, Ib, II, III, IV, OP, C, etc.)
- Calculate amount uses per spray per season/year and frequency
- Equipment, storage, waste and cleaning
- Spraying Behaviors
- Signs & symptoms

Amount of Pesticides Used
(2015 – 2016)

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Farmers</th>
<th>Location</th>
<th>Crops</th>
<th>Average Pesticides Used/ Ha/ yr.</th>
<th>Average Liters/person/ yr.</th>
<th>Average Spray Days/Person/Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>215</td>
<td>Battambang</td>
<td>Rice, Cabbage, Yard long bean, Chilli</td>
<td>2,466</td>
<td>3,761</td>
<td>12</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>43</td>
<td>Sungthong, Vientiane</td>
<td>Chili, tomato, eggplant, and chinese mustard</td>
<td>8,137</td>
<td>6,434</td>
<td>28</td>
</tr>
<tr>
<td>Myanmar</td>
<td>85</td>
<td>Southern Shan</td>
<td>Tomato, Mustard, Pea, Cabbage, Califlower, Orange, Cut flower</td>
<td>3,749</td>
<td>4,190</td>
<td>34</td>
</tr>
<tr>
<td>Thailand</td>
<td>296</td>
<td>Uttarakit, Pathum Thani, Sakon Nakhon</td>
<td>Rice, Corn, Sugarcane, Cassava, Calendula, Soybean, Chilli, Mango, Rubber tree, Bamboo, Orange, Zucchini, Lentils, Cucumber</td>
<td>1,102</td>
<td>4,724</td>
<td>10</td>
</tr>
<tr>
<td>Vietnam</td>
<td>390</td>
<td>Bac Giang, Yen Bai, Lao Cai</td>
<td>Rice, Vegetable, Cabbage, Potato, Kohlrabi, Sweet potato</td>
<td>4,762</td>
<td>1,421</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Regional Studies Results on Testing Pesticides (OP, C) in Blood using Reactive Paper

<table>
<thead>
<tr>
<th>Country</th>
<th>Group</th>
<th>Normal</th>
<th>%</th>
<th>Safe</th>
<th>%</th>
<th>Risk</th>
<th>%</th>
<th>Unsafe</th>
<th>%</th>
<th>Total</th>
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<tbody>
<tr>
<td>Lao</td>
<td>Students</td>
<td>40</td>
<td>13%</td>
<td>141</td>
<td>46%</td>
<td>100</td>
<td>33%</td>
<td>26</td>
<td>8%</td>
<td>307</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>30</td>
<td>5%</td>
<td>209</td>
<td>37%</td>
<td>213</td>
<td>39%</td>
<td>108</td>
<td>19%</td>
<td>560</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>7</td>
<td>4%</td>
<td>80</td>
<td>41%</td>
<td>87</td>
<td>45%</td>
<td>19</td>
<td>10%</td>
<td>193</td>
</tr>
<tr>
<td>Philippines</td>
<td>Students</td>
<td>0</td>
<td>0%</td>
<td>13</td>
<td>8%</td>
<td>85</td>
<td>56%</td>
<td>56</td>
<td>36%</td>
<td>154</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>0</td>
<td>0%</td>
<td>11</td>
<td>5%</td>
<td>101</td>
<td>45%</td>
<td>110</td>
<td>50%</td>
<td>222</td>
</tr>
<tr>
<td>Thailand</td>
<td>Students</td>
<td>384</td>
<td>29%</td>
<td>507</td>
<td>39%</td>
<td>312</td>
<td>24%</td>
<td>103</td>
<td>8%</td>
<td>1306</td>
</tr>
<tr>
<td></td>
<td>Teachers</td>
<td>31</td>
<td>25%</td>
<td>40</td>
<td>32%</td>
<td>29</td>
<td>23%</td>
<td>26</td>
<td>20%</td>
<td>126</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>339</td>
<td>45%</td>
<td>362</td>
<td>48%</td>
<td>41</td>
<td>6%</td>
<td>6</td>
<td>1%</td>
<td>748</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Students</td>
<td>2</td>
<td>2%</td>
<td>36</td>
<td>41%</td>
<td>44</td>
<td>51%</td>
<td>5</td>
<td>6%</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>1</td>
<td>1%</td>
<td>23</td>
<td>15%</td>
<td>94</td>
<td>60%</td>
<td>38</td>
<td>24%</td>
<td>156</td>
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<tr>
<td>Total</td>
<td>Consumers</td>
<td>8</td>
<td>8%</td>
<td>76</td>
<td>77%</td>
<td>14</td>
<td>14%</td>
<td>1</td>
<td>1%</td>
<td>99</td>
</tr>
</tbody>
</table>
### Impact to Biodiversity and Environment

<table>
<thead>
<tr>
<th>Question</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you spray near canal or river?</td>
<td>13</td>
<td>39</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Do you spray near swamp or pond?</td>
<td>26</td>
<td>79</td>
<td>117</td>
<td>92</td>
</tr>
<tr>
<td>Do you spray near big tree?</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Do you spray near forest parcel?</td>
<td>1</td>
<td>3</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Do you spray on the field border?</td>
<td>5</td>
<td>15</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>Do you spray in the rice field?</td>
<td>31</td>
<td>94</td>
<td>75</td>
<td>59</td>
</tr>
<tr>
<td>Do you spray by the roadside?</td>
<td>8</td>
<td>24</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Do you spray near school?</td>
<td></td>
<td></td>
<td>114</td>
<td>89</td>
</tr>
<tr>
<td>Do you spray near house?</td>
<td></td>
<td></td>
<td>100</td>
<td>6</td>
</tr>
<tr>
<td>Do you see any fish die from your spray pesticide?</td>
<td></td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Do you wash the contaminated clothes in water source</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Do you wash thank/equipment near water source</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cambodia Impacts

- Farmers reduced amount of chemical pesticide use through their own botanical pesticide and fertilizer.
- Farmers have considered the use of low risk of pesticide instead of WHO class I.
- Farmers changed their behavior to better use of protected equipment, pesticide storage and disposal.

#### Data of using protective equipment

- 50% SAFE 2015, 50% UNSAFE 2015, 46% SAFE 2016, 54% UNSAFE 2016

#### Amount of pesticide use per ha for crop

- **2015**: 3250, 2716, 1963, 1475
- **2016**: 3500, 3276, 2750, 2015

#### Pesticide disposal practices

- **2015**: 0% in the rice, 10% put in the trash, 10% under the big tree, 20% near the school, 20% near the river, 20% near the barn, 20% in unsafe, 20% other
Safe vegetable for communities:

• 272 farmers in Kampong Chhnang and Battambang provinces had set up their organic home gardens with multi-vegetables used botanical pesticide and liquid compost they produced.

• Vegetable products from the gardens were for households consumptions and sales for generating additional household incomes. The average income from home gardens is 134,000 KHR per garden/hh.

• 18 Schools continue to grow school vegetables and trees.

Habitat in the rice field

• 240 habitats were installed in rice field of in 6 villages, aimed at surveying the aquatic organism during the erratic rainfall.

• Increased fish capture from rice field for home consumption and source of nutrient of the households.

Below are data collected from 70 habitats in Kampong Chhnang province

Amount of aquatic organism

- Shrimp
- Fish
- Frog
- Snail
- Swamp eel

Disposal of pesticide containers

36 disposal tanks were installed in 18 target villages for farmers to dispose their empty pesticide packages/bottles. Until end of 2016, about 14,000 empty pesticide containers have been thrown in the disposal tanks. The target villages are gradually free from pesticide and its bottles.

Women saving group: Two women saving fund established and improved capacity on record keeping. Women from the groups can easily access to the loan for their vegetable production and others crucial need for the family.
Impacts

240 farmers, 156 women (65%) from 4 provinces (Bac Giang, Quang Binh, Yen Bai and Ninh Binh) maintaining "conservation of fish and aquatic animals in rice field". (Over 34 ha applied)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Yen Bai</th>
<th>Quang Binh</th>
<th>Bac Giang</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Rice yields (kg/ha)</td>
<td>5,231</td>
<td>6,913</td>
<td>5,792</td>
</tr>
<tr>
<td>B. Gross income from rice production only</td>
<td>1,779</td>
<td>1,975</td>
<td>1,905</td>
</tr>
<tr>
<td>C. Yields of fish and other aquatic organisms</td>
<td>1,159</td>
<td>567</td>
<td>9,315</td>
</tr>
<tr>
<td>D. Gross income from fish and other aquatic organisms (US$/ha)</td>
<td>2,215</td>
<td>1,349</td>
<td>11,086</td>
</tr>
<tr>
<td>E. Gross income from rice, fish and other aquatic organisms (B + D) (US$/ha)</td>
<td>3,994</td>
<td>3,324</td>
<td>12,991</td>
</tr>
<tr>
<td>F. Input costs (US$/ha)</td>
<td>2,786</td>
<td>1,163</td>
<td>4,560</td>
</tr>
<tr>
<td>G. Profits (US$/ha) of farmers with rice production only</td>
<td>1,277</td>
<td>2,161</td>
<td>8,421</td>
</tr>
<tr>
<td>H. Gross income (US$ increased) in integrated rice-fish-aquatic biodiversity production in comparison with rice production only</td>
<td>453</td>
<td>1,189</td>
<td>550</td>
</tr>
</tbody>
</table>

Impacts

4,143 farmer’s households from Bac Giang, Quang Binh, Yen Bai and Ninh Binh reduced pesticide use, while increasing profitability due to maintaining application of IPM/ ABD/ PRR / SRI on rice, vegetables...
Impacts

Conservation and market access:
FFS alumnae minority ethnic leading formation of two "Cooperatives on conservation of indigenous vegetables". Cooperatives are maintaining contracts with six supermarkets / stores, Restaurant for production and supply their products.

Disposal of pesticide containers after use:
270 collection tanks were constructed in 18 communes of 6 provinces (Women Union and commune People's Committee has mobilized farmers to contribute the money).

Women's Club has mobilized families adopt "Bio-bedding" in livestock raising: in order to reduce discarding of animal wastes into the environment, Bio-bedding promote decomposing process to rid of bad odors, bio-bedding residues are applied to crops instead of chemical fertilizers (60 families adopted).

Schools' vegetables garden with various indigenous species
School Herbal Garden

Local Wisdom
Impacts to ABD (Laos)

<table>
<thead>
<tr>
<th>No</th>
<th>Farm Ecosystem</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Species</td>
<td>% of Total Species</td>
<td>Number of Species</td>
<td>% of Total Species</td>
<td>Number of Species</td>
</tr>
<tr>
<td></td>
<td>Animals</td>
<td>Plants</td>
<td>Animals</td>
<td>Plants</td>
<td>Animals</td>
</tr>
<tr>
<td>1</td>
<td>Roadside</td>
<td>35</td>
<td>60</td>
<td>12%</td>
<td>77</td>
</tr>
<tr>
<td>2</td>
<td>Fields</td>
<td>63</td>
<td>126</td>
<td>24%</td>
<td>137</td>
</tr>
<tr>
<td>3</td>
<td>Field borders</td>
<td>61</td>
<td>58</td>
<td>15%</td>
<td>69</td>
</tr>
<tr>
<td>4</td>
<td>Homestead areas</td>
<td>35</td>
<td>54</td>
<td>12%</td>
<td>180</td>
</tr>
<tr>
<td>5</td>
<td>Ponds</td>
<td>46</td>
<td>29</td>
<td>16%</td>
<td>97</td>
</tr>
<tr>
<td>6</td>
<td>Canals/ditches</td>
<td>41</td>
<td>25</td>
<td>9%</td>
<td>19</td>
</tr>
<tr>
<td>7</td>
<td>Forest/Trees</td>
<td>57</td>
<td>53</td>
<td>14%</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>Wetland</td>
<td>28</td>
<td>11</td>
<td>4%</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>358</td>
<td>416</td>
<td>100%</td>
<td>611</td>
</tr>
</tbody>
</table>

Results

- Community gained knowledge and recognized the importance of farmland BD
- Increase collaborations and efforts for conservations in community
- Localized educational programs for schools and communities
- Better livelihood for all (foods, income, medicine, materials, tradition, pleasant environment)
- Increase of BD
REAL 2016 Status

<table>
<thead>
<tr>
<th>Countries</th>
<th>Schools</th>
<th>Communities</th>
<th>CLCs</th>
<th>Teachers</th>
<th>Students</th>
<th>Farmers</th>
<th>Total</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>18</td>
<td>17</td>
<td>36</td>
<td></td>
<td>3707</td>
<td>482</td>
<td>4225</td>
<td>2082</td>
</tr>
<tr>
<td>Laos</td>
<td>27</td>
<td>25</td>
<td>111</td>
<td></td>
<td>2684</td>
<td>594</td>
<td>3389</td>
<td>1742</td>
</tr>
<tr>
<td>Myanmar</td>
<td>4</td>
<td>23</td>
<td></td>
<td></td>
<td>23</td>
<td>46</td>
<td>46</td>
<td>7</td>
</tr>
<tr>
<td>Thailand</td>
<td>37</td>
<td>26</td>
<td>203</td>
<td></td>
<td>3421</td>
<td>737</td>
<td>4361</td>
<td>2230</td>
</tr>
<tr>
<td>Vietnam</td>
<td>19</td>
<td>19</td>
<td>3</td>
<td>39</td>
<td>3500</td>
<td>4143</td>
<td>7682</td>
<td>5210</td>
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<td>Philippines</td>
<td>3</td>
<td>2</td>
<td>20</td>
<td></td>
<td>154</td>
<td>199</td>
<td>373</td>
<td>179</td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td>67</td>
<td>29</td>
<td>432</td>
<td>13466</td>
<td>6178</td>
<td>27425</td>
<td>11450</td>
</tr>
</tbody>
</table>

Lessons Learned

- Sustainability of the project solely depends upon community participation and decision
- Agencies can facilitate process and support their plans
- Capacity building of designated agencies is necessary
- Mainstreaming and institutionalize local and national concerned agencies, Agriculture, Education, Environment, Health, Commerce???
“I can’t wait to go to study in the field”

Thank You

www.thaied.org  www.thefieldalliance.org
GROUP 1: ASSESSEMENT

1. Manoluck Bounsihalath (NAFRI, Lao PDR)
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6. Thanit Satitboon (TBC)
7. Pirawan Wongnithsathaporn (AIPP)
8. Nguyen Thi Hong Thanh (MARD-DSTE, Vietnam)
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5. Terdsak Pornchongman (TBC)
6. Nguyen Xuan Dung (MONRE, Vietnam)
7. Buncha Chinnasri (Kasetsart University)
8. Kazuhiro Harada (Nagoya University)
9. Pattara Chompumng (MJU, Thailand)
10. Ly Sophanna (MoE, Cambodia)
11. Kim Soben (RUA, Cambodia)
12. Mohd Rafii Yusop (UPM, Malaysia)
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2. Sri Ratnaningsih (MoE, Indonesia)
3. Phanxay Ingxay (MAF, Lao PDR)
4. Somawan Suksprasert (ONEP, Thailand)
5. Pham Anh Cuong (MONRE, Vietnam)
6. Michael Victor (TABI)
7. Xavier Canton-Lamousse (EU)
8. Pech Moran (MoE, Cambodia)
9. UN Phalkun (MoE, Cambodia)
Breakout Group Results

Assessment

Innovations and Best Practices
Capacity Building

TARGET GROUP

Farmers

Indigenous & local communities

University

Actions

S - Training, workshops
M - Extension programs
N - Give incentives
P - Pilot projects (on-farm, demonstrations)
S - Farmer yield days

WHY

Why and value

For example, increased productivity

Government (Policy makers)

1. Set up coordination committees
2. Training/education
3. Education, agriculture, research

Universities

- Curriculum development
- Research, development

Capacity Building

CAPACITY

1. Schools < teachers, students
2. Training, consultation
3. School gardening programs
4. Private sectors
5. Agriculture, industry, research
6. NGOs, government

Whom for whom

TV programs, information, social, networks

Media, TV, radio, newspapers

Regional Workshop on Maintaining Biodiversity in Agriculture for Sustainable Development and Food Security in Southeast Asia International Education and Training Center, Mahar University, Chiang Mai, Thailand 1-13 September 2017
Dr. Wayne Nelles - Ways Forward for Agrobiodiversity Conservation and Sustainable Use in ASEAN Member States (AMS)

WAYS FORWARD for AGROBIODIVERSITY CONSERVATION and SUSTAINABLE USE IN ASEAN MEMBER STATES (AMS)

Wayne Nelles, Ph.D. Canadian Visiting Scholar, Chulalongkorn University School of Agricultural Resources (CUSAR), Bangkok, THAILAND

Session: Ways Forward and Recommendations
13 September 2017, 15:00 - 15:30

Reminder of Suggested “Ways Forward” (from ABO2)

Overall the ABO2 suggests that we need to better provide genetic diversity to enhance and sustain agricultural productivity.

This is an essential part of the “Ways Forward” it recommends in particular (and minimally) as follows:

- Better Ex-Situ and In Situ Conservation
- Making crucial information available
- Establishment of an ASEAN Regionally Important Heritage System (ARIOHAS)
- Improving the ASEAN Policy framework for Agricultural Biodiversity

(ASEAN Centre for Biodiversity, 2017, pp. 49-55)
SOME PRELIMINARY THOUGHTS on
WAYS FORWARD/NEXT STEPS
Means for Advancing the Agrobiodiversity Agenda in ASEAN

1. FIRST Work to Draft an ASEAN Regional Action Plan (RAP) on Agrobiodiversity Mainstreaming, Conservation and Sustainable Use (AMCSU), 2017-2020.

2. SECOND. Implement RAP-AMCSU approved by AMS under CBD programme of work on agricultural biodiversity. Design, secure adequate funding for and at least four major new interrelated projects (with sub-components) to support:
   a. Assessments;
   b. Innovations, Best Practices or Adaptive Management;
   c. Capacity-building;
   d. Mainstreaming.

3. THIRD. Support/Integration with complementary or parallel processes in different sectors to encourage cross-sectoral and interdisciplinary collaboration engaging intergovernmental, academic, CSO, farmer group and other partners.

4. FOURTH. Link to, for example, to one (among many possible initiatives) under ASEAN Work Plan on Education (AWPE), 2016-2020 led by Thailand and Philippines with UNESCO (INVITATION to ENGAGE for Agrobiodiversity Mainstreaming).

1a. CONDUCT ASSESSMENTS
MAIN INITIAL ASSESSMENT ACTIVITIES
(Subject to adequate Funding and other Resources)

GOALS & OBJECTIVES

• COMPLETE/ELABORATE EMAIL SURVEY of AMS (with follow-up Interviews, Field Visits and National Consultations when/where feasible 2017-2018)

• ESTABLISH 10 national committees and one ASEAN regional multi-disciplinary scientific committee on Agrobiodiversity to conduct ongoing policy-relevant, participatory, applied research and peer-reviewed assessments in collaboration with governments, extension agencies and regional or international organizations. These scientific committees may become an ad hoc or permanent advisory group of science experts under ACB oversight.

• CONDUCT a comprehensive mapping of Agrobiodiversity (species, seeds, data-bases, data-collection tools, methods and scientific resources, etc.) as well as management, monitoring and oversight capacities and needs within AMS

• GATHER new and sufficient data to fairly assess the status and trends of pollinators in Southeast Asia (called for by IPBES) analyzing broader agrobiodiversity links.

BORROW FROM/TEST INNOVATIVE ASSESSMENT MODELS

TEST PROVEN & INNOVATIVE MODELS IN ASEAN CONTEXTS

• PILOT an ASEAN Regional Agrobiodiversity Index (building on Bioversity International’s recent conceptual work). Test the model which could also be compared with and scaled-up in other regions – in cooperation with CGIAR and other experts.

• BORROW/ADAPT data gathering work and scientific committee model initiated by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) on Pollinators led by UNDP, UNESCO UNEP and FAO with partners. BROADEN and APPLY to agrobiodiversity as a whole.
Preliminary (incomplete) Research Questions to Guide Assessments for CBD and Others (1)

1. **MAPPING DIVERSITY** What principal types of agrobiodiversity (crop, livestock, fisheries, pollinators, seed varieties) in South East Asia and the agro-ecological and geo-climatic zones systems or zones that support them? This should be a base-line mapping exercise.

2. **MAPPING THREATS**. Which crop species and seed varieties are currently most threatened and need urgent and long-term protection?

3. **DRIVERS/ANALYSIS**. What are key drivers or contributing factors to agrobiodiversity loss (and alternatively) conservation and sustainable use in each ASEAN Member State (AMS)?

4. **CONSERVATION/SUSTAINABLE USE**. What approaches and efforts exist in AMSs and by core partners (national research agencies, universities, farmer groups, CGIAR, UN, etc.) to quantify, conserve and mainstream agro-biodiversity in national policies or programs?

5. **POLICIES/LAWS**. What current national or regional or international policies and legal instruments for agrobiodiversity conservation, climate change resilience and human rights exist, and how can they be improved?

Preliminary (incomplete) Research Questions (2) cont.

6. **VALUATION**. What new research on “valuing agrobiodiversity” can better demonstrate economic incentives and budget and tax shifting for effective agrobiodiversity conservation including piloting comprehensive “payments for agrobiodiversity conservation services” (PACS) schemes?

7. **INDICATORS**. What indicators (linked to achieving various SDGs together with CBD/Aichi targets) can be used to document, demonstrate and then upscale best practices for agrobiodiversity conservation and sustainable use?

8. **BEST PRACTICES/MODELS**. What are some exemplary models/cases of effective agrobiodiversity conservation, sustainable use and climate change resilience working in synergy in each AMS, that can also be assessed for replicability?

9. **PARTNERSHIPS**. How do/can partnerships (of different stakeholders groups) help facilitate agrobiodiversity research, education, conservation and sustainable use?

10. **SCALING-UP**. How can lessons learned from agro-biodiversity research and exemplary models in ASEAN be scaled-up through what tools or mechanisms?
MAIN PROPOSED ASSESSMENT OUTPUT(S)
(Short and Medium Term to 2020)

A. NATIONAL (incorporating LOCAL COMMUNITY-level consultations/inputs)

1. DEVELOP (and begin to IMPLEMENT) full National Agro-Biodiversity Strategy and Action Plans (NASAPs) for all 10 AMS through a new collaborative applied cross-learning effort between and among AMS, scientists, local community governments, farmer groups, other partners and donors

B. REGIONAL (ASEAN Level)

2. DEVELOP (and begin to IMPLEMENT) a full ASEAN Regional Action Plan (RAP) on Agrobiodiversity Mainstreaming, Conservation and Sustainable Use (AMCSU), 2017-2020

3. DRAFT and PUBLISH the 1st ASEAN Regional Report on State of Agrobiodiversity by early 2020, included as a component of any reporting to the CBD-COP re Assessment of Aichi Targets CBD. Follow model/template of the ABO (1st and 2nd editions) with an Agrobiodiversity theme. Draft to be completed and under peer review, while final report is edited and approved by AMS while also reporting ASEAN progress at CBD-COP in 2020 on CBD Strategic Plan for Biodiversity 2011–2020

1b. INNOVATIONS, BEST PRACTICES OR ADAPTIVE MANAGEMENT

1b. DOCUMENT/ENABLE INNOVATIONS, BEST PRACTICES OR ADAPTIVE MANAGEMENT

(based on DATA/EVIDENCE & APPLIED RESEARCH)
DATA/EVIDENCE & APPLIED RESEARCH
(informing Best Practices)

HOW CAN WE USE/APPLY POLICY-RELEVANT RESEARCH?
(based on evidence/knowledge of what works – overlapping with/building on assessments)

1. PILOT TEST/APPLY DOCUMENTED BEST PRACTICES or INNOVATIVE MODELS FOR CONSERVING or ENHANCING AGROBIODIVERSITY adapted for different agro-ecologies, species, crops, communities, regions, cultures, local governments, etc.

2. SUPPORT COMPARATIVE ANALYSIS of lessons learned about innovations and best practices from agro-biodiversity research and exemplary models (in selected ASEAN countries/regions)

3. SCALE-UP WHAT ALREADY APPEARS TO WORK (But continue Field Testing in different settings to assess long-term social, economic and environmental impacts)

1c. CAPACITY-BUILDING

and

ENABLING ENVIRONMENTS/TOOLS
1c. FACILITATE AGROBIODIVERSITY CAPACITY-BUILDING
(Knowledge, Education, Learning – FORMAL & NON-FORMAL)

DEVELOP/INITIATE SE ASIA REGIONAL AGROBIODIVERSITY EDUCATION and CAPACITY-BUILDING PROJECT(s) using Research for Development (R4D) Model with Partners

1. MAPPING (how Agrobiodiversity is taught, studied and learned) of
   • Schools
   • Universities
   • Extension Services

2. STRENGTHENING AGROBIODIVERSITY SCIENCE, EDUCATION, PUBLIC AWARENESS, GOVERNMENT MANAGEMENT & LEARNING CAPACITIES
   • School Gardens
   • Research Farms
   • Training Extension Offices
   • Farmer Field Schools
   • University Curricula and Programs
   • Learning Resources
   • Scientific Data-bases
   • Policy Briefs for Government officials, decision-makers, etc.
   • Publications (of ASEAN Scholars) which also improves university quality, rankings, etc.

1c. FACILITATE AGROBIODIVERSITY POLICY CAPACITY-BUILDING
(Dialogue and Development)

DEVELOP/INITIATE SE ASIA REGIONAL AGROBIODIVERSITY PROJECT(s) for POLICY ANALYSIS, DEVELOPMENT and IMPLEMENTATION with 5 main elements

1. Stakeholder Consultations and Policy Dialogue

2. Policy Development and Drafting

3. Policy Analysis and Education (through Science-based policy briefs)

4. Drafting of National Agrobiodiversity Plans

5. Monitoring and Evaluation of Policy Implementation
1d. MAINSTREAMING

Agrobiodiversity Mainstreaming
(in National Policies, Ministries, Plans)

DEVELOP/INITIATE SE ASIA REGIONAL AGROBIODIVERSITY MAINSTREAMING PROJECT(s) for with e main goals elements

1. **STRENGTHEN** agrobiodiversity analysis and commitments in revised National Biodiversity Strategies and Action Plans (NBSAPs), as CBD guidance suggests

2. **REVIEW** all relevant National Ministries, Departments and legislation (Agriculture, Environment, Forestry, Commerce, etc) for Policy Coherence, Alignment and Support for Agro-biodiversity,

3. **ASSESS** and **ENCourage** CCAs, PRSPs, UNDAFs and other national policies and planning tools to support and proactively enable (or minimally not undermine or obstruct with contrary policy goals or programs) agrobiodiversity rationale, commitments and actions.
Example of one Opportunity for Mainstreaming
(outside main ACB Process)

Agrobiodiversity Science, Research and Learning in
the

ASEAN Work Plan on Education (AWPE), 2016-2020 led
by Thailand and Philippines with UNESCO

(INVITATION to ENGAGE
for Agrobiodiversity Mainstreaming through policy dialogue
and publications

ASEAN Work Plan on Education, 2016-2020
(Project #47 Text - Approved by ASEAN Education Ministers)
Notice: CALL for PAPERS
Chula 2018 Conference  (supported mainly by OHEC Thailand, small grant)

“Greening Agri-food Systems, Ensuring Rural Sustainability and Promoting Healthy Socioeconomic Transformation in Southeast Asia through Social and Sustainability Sciences”

Multi-disciplinary EDUCATION FOR SUSTAINABLE AGRICULTURE (ESA) Research Initiative and Regional Conference contributing to the ASEAN WORK PLAN on EDUCATION (AWPE), 2016-2020 and United Nations Sustainable Development Goals (SDGs), 2015-2030

Summative Event (23-25 January 2018) in Bangkok marking the 100th Anniversary of Chulalongkorn University (CU) with many partners

ABSTRACTS Due: EXTENDED DEADLING Monday 16 OCTOBER 2017

FULL PAPERS (for Proceedings) Due: Monday 11 DECEMBER 2017

Details (with online Registration link) to be Posted on UNESCO Bangkok Regional Unit for Social and Human Sciences in Asia and the Pacific Website http://bkk.unesco.org/theme/social-and-human-sciences

SPECIAL SESSIONS PLANNED (implicating OA Education):
“Future of Sustainable Agriculture Education and Research in ASEAN” – Thursday 25 Jan 2017

PLENARIES (Policy Dialogues):
1. Future of Sustainable Agriculture Education and Research in ASEAN (University, Government, ASEAN, UN, CGIAR, Farmer-Scientists and other Representatives)

2. Strengthening Social and Sustainability Sciences and Education for Green, Climate Resilient Agri-food Systems in ASEAN to Meet SDGs

PARALLEL/RESEARCH REPORTING SESSIONS:
• Systematic “mapping” and critical analysis of SA and OA curricula, programs, and teaching of all Southeast Asian HEIs – Papers invited/planned especially for all eight countries with strong Agriculture-based economies (i.e. Cambodia, Indonesia, Laos, Malaysia and Myanmar, Philippines, Thailand and Viet Nam) – with Proceedings Published
• At least one day discussion facilitated by: “Expert Group on Higher Education for Sustainable Agriculture (HESA) and Food Systems in Southeast Asia” with UNESCO and other partners (http://www.siani.se/expert-groups )