BOOK OF ABSTRACTS

2ND INTERNATIONAL CONFERENCE ON AGRICULTURAL AND RURAL DEVELOPMENT IN SOUTHEAST ASIA

12–13 November 2014 • Makati Shangri-La, Manila, Philippines
2nd International Conference on Agricultural and Rural Development in Southeast Asia

Strengthening Resilience, Equity, and Integration in ASEAN Food and Agriculture Systems

BOOK OF ABSTRACTS

12-13 November 2014 | Makati Shangri-La, Manila, Philippines
To all participants in the Second International Conference on Agricultural and Rural Development in Southeast Asia, Mabuhay!

The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) is pleased to publish this book of abstracts of the Conference themed Strengthening Resilience, Equity, and Integration in ASEAN Food and Agriculture Systems. This publication aims to provide a snapshot of the richness of discussions on Inclusive and Sustainable Agricultural and Rural Development (ISARD) in the region, which is the focus of both the conference and SEARCA’s 10th Five Year Plan (2014/2015 to 2018/2019).

We are truly grateful to our partners in this event who share our vision of a progressive and food secure Southeast Asian region.

Gil C. Saguiguit, Jr.
SEARCA Director
On behalf of the Asia Pacific Adaptation Network (APAN), an Asia Pacific-wide regional network of practitioners responding to the growing and urgent need for climate change adaptation, I would like to welcome all the delegates to the 2nd International Conference on Agricultural and Rural Development in Southeast Asia: Strengthening Resilience, Equity, and Integration in ASEAN Food and Agriculture Systems.

The conference presents an excellent opportunity to discuss and learn about the interlinkages between agriculture and development and ponder upon important issues related to agriculture including climate change adaptation, mitigation, and disaster management to ensure food security and sustainable development in the face of current and future climate adversities.

APAN’s mission is to help build climate change resilient and sustainable human systems, ecosystems, and economies in countries across the Asia-Pacific region. I believe and hope that the discussions at this conference would help enhance the knowledge and capacity of the relevant stakeholders and lead to sharing of new knowledge and lessons to ensure a sustainable future.

Prof. Masataka Watanabe
Chair, Asia Pacific Adaptation Network (APAN)
It is a very special honor and pleasure for me to congratulate SEARCA on the Second International Conference on Agricultural and Rural Development in Southeast Asia. The German Academic Exchange Service (DAAD) is proud to be able to co-sponsor this conference.

Agriculture and rural development play a key role in Asian countries and are a critical component of strategies for economic growth and food security as well as poverty reduction. It is essential that strong measures be taken to combat poverty and hunger. Three out of four poor people in developing countries live in the countryside and most of them depend directly or indirectly on agriculture for survival. Agricultural and rural development can therefore make a difference in their lives. In this time of climate change, there is also an urgent need for measures to be taken to reduce its impact on agriculture.

The DAAD is the largest funding organization in the world supporting the international exchange of students and scholars. Since it was founded in 1925, more than 1.5 million scholars in Germany and abroad have received funding. The activities of the DAAD go far beyond awarding grants and scholarships. The DAAD supports the internationalization of German universities; promotes German studies and the German language abroad; assists developing countries in establishing effective universities; and advises decision makers on matters of cultural, education, and development policy.

The DAAD provides support to many educational cooperation activities in Asia. We are pleased to have been able to play a part in the development of SEARCA from the very beginning and to cooperate with a strong member of the worldwide family of leading agricultural institutions. SEARCA has always played an eminent role in the DAAD cooperation strategy with ASEAN.

At the beginning of the 21st century, agricultural and rural development faces numerous challenges. I am sure that this conference will address the major issues and provide a stimulus for fruitful discussion.

On behalf of the DAAD I wish SEARCA all the best for the conference and the future.

Ilona Krüger
Head of Section South East Asia
German Academic Exchange Service (DAAD)
Bonn, Germany
ural development and agriculture are at the heart of Germany’s international commitment. As a federal enterprise, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH can look back on many years of close cooperation with ASEAN and its member states. We provide support in three main areas, namely economic integration, environment and climate change, and assist the ASEAN Secretariat through capacity building. In 2014, a total of EUR 37 million has been allocated to the implementation of ASEAN-German projects.

The ASEAN countries have achieved tremendous economic growth in recent years. Nevertheless, fighting poverty remains high on the agenda as the benefits from this growth have not been equitably shared across the population. The rural population faces particularly serious challenges in relation to income, productivity, and crucial services such as education and health.

Working toward sustainable development in rural areas is not only a commitment but also our core business. We are therefore grateful to the organizers of the conference, the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), for inviting us to support this endeavour.

In light of climate change, unbalanced economic growth, and the upcoming establishment of the ASEAN Economic Community in 2015, resilience, equity, and regional integration are becoming ever more critical topics for policy makers, producers, and consumers. The equal participation of women in economic development also has a key role to play.

As sponsor of the 2nd International Conference on Agriculture and Rural Development in Southeast Asia, we are pleased to be able to contribute technical input to the sessions and panels and to share the experience we have gained over many years of involvement in international cooperation.

We believe the future of agriculture in the ASEAN region will be strongly influenced by certain key challenges. These include climate change, biodiversity loss, a fast-growing population, and rising pressure on land resources. Appropriate solutions to these challenges are still are to be found. Helping the poor population to become more resilient will be crucial.

However, we see exciting potential in the region. A young and energetic population, increasing investment by the private sector, international linkages, and a new trend toward openness within the ASEAN area could be key assets in the search for solutions to food and nutrition insecurity and poverty.

The German Federal Ministry of Economic Cooperation and Development (BMZ) has developed strategies to address a number of the issues we are facing, focusing on areas such as promoting sustainable agriculture, investments in land and the phenomenon of land grabbing, and rural development and its contribution to food security.

We are looking forward to productive, in-depth discussions on strategies, experiences, and solutions. GIZ will convene a session on integrated ecosystem management and provide inputs on sustainability and poverty reduction on the basis of its experiences in upland agriculture in the Philippines and in regional food security systems and investments.

I would like to thank SEARCA for choosing to work in partnership with GIZ and to wish all participants a very successful conference.

Christel Weller-Molongua
Head of Division Rural Development and Agriculture, GIZ
Cordial greetings to the organizers, participants, and guests of the 2nd International Conference on Agricultural and Rural Development in Southeast Asia.

It is not an overstatement that the battle against reduction of hunger and poverty can be won or lost in rural areas of developing countries. More than 75 percent of the world’s population living in extreme poverty are found in rural areas.

The Food and Agriculture Organization argues that economic growth in the agriculture and rural sectors has much greater impact in reducing poverty and hunger than do urban or industrial growth. Indeed, national and international commitments on poverty and related targets such as the Millennium Development Goals and Poverty Reduction Strategies have now given importance to the role of agriculture in rural development and poverty reduction.

However, achieving sustainable agricultural and rural development is challenged by limiting agricultural resources, increasing population, and uncertainties in climatic conditions brought about by climate change. Appropriate strategies and solutions to overcome these challenges would include, among others, policy adjustments, education initiatives, resource management, and development of appropriate and new technologies.

There are greater opportunities in achieving agricultural productivity and food security objectives with the adoption of new and proven technologies in agriculture. Recent advances in biotechnology research resulted in productivity improvements in agriculture with the development and commercialization of biotech crops. While recurring debate on the food and environmental safety of biotech crops lingers, adoption of the technology continues to expand. Global adoption of biotech crops has now reached more than 175 million hectares, majority of which are in developing countries. The session on Biotechnology and Biosafety, which ISAAA convenes in this conference, provides erudite discussion on the safety, regulation, and benefits of biotechnology and its products.

We congratulate SEARCA for holding this conference, providing a venue to discuss challenges of promoting ARD in the Southeast Asian region, and beyond.

Randy A. Hautea
Global Coordinator and SEAsia Center Director
International Service for the Acquisition of Agri-biotech Applications
It is my pleasure to welcome all the participants to this conference. I want to congratulate SEARCA for organizing this important event that may shape the future of agriculture in Southeast Asia, as well as improve the lives of our countrymen in the rural areas.

We are now living in the digital era where information and communication technology is the heart of established and booming industries. Yet, the Philippines is still home to impoverished people, most of whom are in the rural areas. It is believed that poverty may be significantly reduced through inclusive and sustainable growth, which includes rural development, sustainable agricultural growth, and effective natural resource management. However, the continuing challenges to the natural resource base upon which the poor depend for their livelihood have constrained us from achieving this growth.

These challenges pose opportunities as well for the different agencies in the agriculture and aquatic sectors to implement programs to increase food production through biotechnology and other innovations, agricultural infrastructure, and the creation of broader and deeper markets for more value-added products. It is also important to empower rural communities and enhance the role of smallholder farmers in the market value chain through timely and correct information and through S&T interventions that these farmers can use.

All of these challenges and opportunities for sustained inclusive growth have been recognized by PCAARRD. As one of the DOST Councils that sets the directions for developing S&T strategies and innovations to address agricultural development, PCAARRD has been tapping its network throughout the country to craft and implement R&D projects under the Industry Strategic S&T Programs or ISPs. These ISPs describe the targets for the crops, livestock, forestry and environment, and marine and inland aquatic sectors, and pinpoint the aspects of the industry where S&T will make a difference. PCAARRD ensures that the programs under these ISPs are outcome-based, which calls for the identification of industry benchmarks and specific S&T gaps for the articulation of interventions needed, especially at the grassroot levels.

These ISPs also cover cross-cutting concerns on technology commercialization and policy research and advocacy. In areas where S&T interventions introduced in S&T-based farms have successfully addressed gaps and improved farm yield, the S&T community-based farms are gradually implemented. Farmer co-operators of the same commodities are organized and given access to successful S&T interventions and relevant agricultural information.

Our participation in this conference will enable us to keep abreast with developments and gaps in agricultural and rural development (ARD) which will be very helpful in continuously improving our programs under the ISPs. The conference could also contribute to strengthening PCAARRD’s partnerships with international organizations as well as in developing new collaborations.

Thank you for allotting your valuable time and resources to participate in this event. Rest assured that your involvement will greatly help in coming up with the appropriate strategies and policies that push for ARD. Mabuhay!

**Patricio S. Faylon**
Executive Director, Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development
Welcome to the 2nd International Conference on Agricultural and Rural Development in Southeast Asia (ARD2014). Syngenta is pleased to play a supporting role as one of the sponsors of the conference.

The theme of this year’s conference is “Strengthening Resilience, Equity, and Integration in ASEAN Food and Agriculture Systems,” highlighting some of the critical areas in agriculture in the region, and the need for firm and immediate action.

There exists a fundamental disconnect in much of the discussion and debate on food security. We know we need to produce more food for a growing global population in an environmentally sustainable way. The knowledge and tools available should be in the hands of the growers, but there are challenges to making that happen.

What is required is positive and productive dialogue, and collaboration and action among governments, the private sector, and other key stakeholders if we are to meet the challenges of food security in Southeast Asia. Productivity improvement, inclusive value chains, sustainability, food security, and food safety—these are some of the key focus areas of ARD2014, and we will certainly see robust discussion and debate on these topics during the conference.

More importantly, beyond just talk, we believe that ARD2014 is a platform for action, bringing together sustainable and innovative solutions from different players of the agricultural supply chain, and potentially catalyzing partnerships among members of the ecosystem, from both the private and public sectors. The lessons learned from the interactions of the delegates and the distinguished speakers will hopefully inform and guide the formulation of constructive policy for the benefit of the region.

The Rice Bowl Index is one way Syngenta supports the dialogue and collaboration around the topic of food security. It is a tool that assesses how robust a country’s capacity to address the challenges of food security is. Using the Rice Bowl Index, we hope to provide a holistic way for policy makers to assess food security, and from there, develop constructive discussions with key stakeholders. I will be sharing more on the Rice Bowl Index at the Food Security Governance session during the conference, and look forward to seeing many of you there.

Over the next two days, I am sure we will all gain a greater understanding of the challenges we face in the agriculture and rural development sector, and a clearer direction on how we can work together to overcome them. Enjoy the conference and interactions, and I wish you a most fruitful time at the ARD2014.

Andrew McConville
Head of Corporate Affairs, Asia Pacific
Syngenta
Strengthening Resilience, Equity, and Integration in ASEAN Food and Agriculture Systems*

Rationale

The agricultural economy and the rural sector continue to loom large in the development agenda of Southeast Asian economies. For almost all of them except Singapore, agriculture remains a dominant economic sector in terms of contribution to total output, and for some, the most prominent based on contribution to overall employment. But for all that importance of the agriculture sector and rural economy, it is also the sector wherein poverty tends to be most prevalent, persistent, and most vulnerable to the damage caused by natural disasters, environmental degradation, and climate change.

The challenge of promoting agricultural and rural development (ARD) and reducing the incidence of poverty in the agriculture and rural sector is a complex one. An effective pursuit of ARD would thus require a systems perspective of a multidisciplinary nature. There is great value in deepening the knowledge base within the various disciplines and fields of study involved in ARD through constant research and innovation, and periodic expert gatherings.

It is for this reason that SEARCA has set out to provide a regular forum for such a discussion of ARD challenges in Southeast Asia under a wholistic, systems-oriented, multi-disciplinary, and multi-stakeholder perspective, starting with the Second International Conference on Agricultural and Rural Development in Southeast Asia (ARD2014). The first such gathering spearheaded by SEARCA in 2005 addressed the subject primarily from the economic perspective and was participated in mostly by scholars in the fields of agricultural economics and development economics. Even so, it proved to be a most valuable forum that yielded the most authoritative compendium to date on the state of knowledge on ARD in Southeast Asia. With ARD2014, SEARCA seeks to build on the 2005 conference with a more inclusive knowledge exchange benefiting from the participation of representatives from various disciplines and various stakeholder groups. In so doing, it is envisaged that apart from gaining expanded knowledge from attending the forum, participants would benefit from a broadened perspective from which they perceive and analyze the challenges of the ARD sector, and conceive the approaches to addressing them.

Objectives

ARD2014 provides a venue for sharing the wide and diverse knowledge pool on ARD that exists within and beyond the Southeast Asian region. Through the conference, SEARCA aims to accomplish three objectives.

First, the forum aims to highlight creative and innovative technological and practical approaches in the various processes of agricultural systems spanning the entire agricultural value chain from production through to post-harvest, processing, marketing, transport, and logistics.

Second, the conference seeks to showcase and derive useful lessons from institutional successes (as well as failures) in the management of agricultural systems and rural communities, including governance and value chain relationships.

Third, it is expected that participants would be able to draw evidence-based policy implications from the knowledge exchange, that could in turn help guide regional, national, and sub-national policies and initiatives for ARD in the context of intensified regional cooperation and integration.

Excerpted from the background paper of the same title by Dr. Cielito F. Habito, Conference Technical Adviser and Coordinator, the full text is downloadable from http://bit.ly/ard2014-background-paper
Resilience, Equity, and Integration

ARD2014 focuses on issues, imperatives, and initiatives contributing to the theme Strengthening Resilience, Equity, and Integration in ASEAN Food and Agriculture Systems.

Resilience connotes sustainability, a theme that has been prominent in the development discourse since the Brundtland Commission Report coined and defined the term “sustainable development” in 1987. Resilience of food and agricultural systems is currently being tested against the challenges of rapid urbanization and social transformation, resource and environmental degradation, and heightened regional and global competition with regional and global integration of markets.

Equity considerations are now commonly articulated in the phrase “inclusive growth” or “inclusive development,” reflecting recognition of the need for wide and even access to the opportunities to participate in and benefit from development. It pertains to the distribution of asset endowments, access to resources and technology, and opportunities for advancement and economic gain.

Integration captures the essence of the trend toward borderless economies, manifested in globalization of markets and the rise of mechanisms for closer regional political and economic coordination and cooperation. In Southeast Asia, this is prominently being advanced through the establishment of the much-anticipated ASEAN Economic Community (AEC) that will culminate in 2015.

Productivity Improvement

Increased productivity has traditionally been approached through technological improvement at various components of the farm production system. Researches in traditional plant and animal breeding, and in more modern albeit sometimes controversial biotechnology techniques, have pushed the inherent fundamental productivity of agricultural production. Productivity improvement through more efficient and effective application of inputs leads to lower costs per unit of product, hence greater competitiveness and resilience. It also leads to higher returns on the factors of production, thereby bolstering social resilience.

Meanwhile, the theme of equity would be served through productivity improvement to the extent that equal access to knowledge on improved technology and farm management practices can be fostered across the region. Similarly, the theme of integration is served through closer partnership among countries and across educational and research institutions in the region toward wider access to knowledge. Economic integration through liberalized movement of factors and products across countries would provide the very impetus for countries lagging in terms of productivity and cost competitiveness to undertake deliberate measures to catch up.

THEME CHAIR: Dr. Glenn Gregorio, IRRI

Inclusive Value Chains

In the past, there was an observed tendency for inordinate focus on production systems and productivity improvement in the traditional orientation of policy research, discussions, and operational frameworks of agriculture-focused institutions, including and especially agriculture ministries. In recent years, this thinking has given way to a more systems view that recognizes the importance of considering the entire agricultural value chain spanning the range from farm finance and provision of farm inputs, through logistics and value adding/processing activities, on to getting the products to the final consumers.

Efficient value chains foster resilience, especially in the economic dimension. Inclusive value chains foster equity, with particular focus on greater participation of farmers and smaller processors to increase farm incomes. When value chains transcend national boundaries, these regional value chains or production networks foster stronger regional integration as well. Wider opportunities for regional value chains for agricultural products remain to be explored.

THEME CHAIR: Dr. Rolando T. Dy, UA&P

Sustainability and Poverty Reduction

Resilience and equity are directly served by conscious efforts to ensure sustainability in agricultural production systems and to reduce rural poverty in its multiple dimensions. Sustainable agricultural practices have found increasing albeit still limited following in countries in the region. Sustainable upland agriculture is an important area of activity and body of knowledge, especially in places where the agricultural land frontier is closing up.

Poverty in its economic, social, environmental, cultural, and political dimensions is rooted in lack of endowments in five forms of assets: financial, human, natural, physical, and social capital. Interventions to reduce poverty fall under three modes: (1) those that expand the poor’s endowments of these various forms of capital, either by outright redistribution or by improving access to them, (2) those that increase the benefits (income or welfare) that they derive from these assets, and (3) those that enrich or protect these asset endowments.

THEME CHAIRS: Dr. Doris Capistrano, ASFC and Dr. Percy Sajise, Bioversity International
Indeed, knowledge gaps in the food and agriculture systems of Southeast Asia remain substantial. Working together toward greater resilience, equity, and integration therein will require regular wide knowledge exchange across the region that ARD2014 hopes to set in motion as a regular exercise in the years to come.

Sub-Themes

The Conference is organized around six sub-themes (SEE BELOW), each with a conscious and deliberate effort to address implications on resilience, equity and integration. This was done in close coordination with the Theme Chairs who reviewed all the session abstracts for alignment with the theme. During the conference, they will synthesize the discussions in the different sessions under the themes for presentation in the closing program.

Food Security and Food Safety

The goal of food security is a universally shared ideal within the Southeast Asian region and beyond, and is always identified as a key societal objective of agricultural development.

Threats to food security may be physical, natural, political, social/cultural, and economic. Approaches to food security may be undertaken at the local, national, and regional levels, and hinges on appropriate governance mechanisms that lead to efficient, effective, and timely provision of food to the populace. Resilience is the direct outcome of or is closely associated with food security. The equity ideal is fostered when food security measures do not unduly benefit some groups or put others at a disadvantage. Finally, regional integration could very well be the means to avoid inappropriate national policies that confuse food security goals with attaining food self-sufficiency.

THEME CHAIR: Dr. Paul Teng, NIE

Institutions and Governance

Agricultural production, productivity and incomes are as much the result of the nature of the policy, regulatory, and institutional environment as that of the physical and natural environment.

In a predominantly smallholder-based agricultural system, especially where prior land reform efforts had deliberately moved the sector in that direction, small producers need to achieve higher efficiencies with economies of scale through the ability to cluster together and transact with the rest of the value chain. The efficient operation of land markets and assured security of tenure are critical to attracting productive investments in the agriculture sector. Another crucial challenge of an institutional nature is the research and innovation system that is critical to sustained productivity improvement in food and agriculture systems. Innovation systems must be guided by the actual demands of resilience, equity, and integration, for the products of research and innovation to become truly instrumental to uplifting lives in rural communities.

THEME CHAIR: Dr. Francisco P. Fellizar, Jr., Ritsumeikan Asia Pacific University

Regional Cooperation and Integration

The impending culmination of the ASEAN Economic Community in 2015, and the recognized need to plan strategically well beyond, is calling attention to the various modes of regional coordination and cooperation especially in the various aspects of the food and agriculture system in the region. For example, food security might very well be most efficiently approached through regional cooperation rather than primarily at the national or local levels. Knowledge building and sharing across the region is critical to stronger integration, while also building greater resilience and promoting wider equity especially where deliberate efforts toward inclusive access to knowledge are pursued. The dynamics of intra- and extra-regional trade in agricultural commodities will inevitably and increasingly receive prominent attention, particularly because sensitive agricultural products have been among the longest holdouts to the full liberalization of trade in goods within the region, and globally.

THEME CHAIR: Dr. Nipon Poapongsakorn, TDRI Foundation
### DETAILED CONFERENCE PROGRAM

**Day 1 (12 November)**

<table>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>7:30 a.m.</td>
<td>Registration</td>
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<tr>
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<td>OPENING PROGRAM</td>
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<td>Welcome/Opening Remarks</td>
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<td>Dr. Gil C. Saguiguit, Jr., SEARCA Director</td>
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<td>Introduction of the Keynote Speaker</td>
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<td><strong>His Excellency Benigno Simeon Aquino III</strong></td>
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<td>President of the Republic of the Philippines</td>
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<td>Represented by Hon. Virgilio R. De Los Reyes</td>
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<td>Secretary, Department of Agrarian Reform, Philippines</td>
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<td></td>
<td>Master of Ceremonies: Dr. Maria Celeste H. Cadiz, Program Head for Knowledge Management, SEARCA</td>
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<td>9:30</td>
<td>GROUP PHOTO, OPENING OF EXHIBIT/BOOK LAUNCH AND SIGNING</td>
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<tr>
<td>10:00</td>
<td>Coffee Break/Networking</td>
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<td>10:30</td>
<td>PLENARY 1 - Resilience, Equity, and Regional Integration in Southeast Asian Agriculture</td>
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<td>Conference Overview and Background</td>
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<td>Strengthening Resilience, Equity, and Integration in ASEAN Food and Agriculture Systems</td>
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<td>Dr. Cielito F. Habito</td>
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<td>Professor of Economics, Ateneo de Manila University</td>
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<td>Former Secretary of Philippine Socio-economic Planning, SEARCA Senior Fellow, and Conference Technical Adviser and Coordinator</td>
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<tr>
<td>11:00</td>
<td>Toward Sustainability and Resilience in ASEAN Agriculture</td>
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<td></td>
<td>Mr. Tin Htut Oo</td>
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<td>Chairman, National Economic and Social Advisory Council (NESAC), Myanmar</td>
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<td>To be represented by: Mr. Tin Aung Moe</td>
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<td>Program Director, Myanmar Peace Center (MPC)</td>
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<td>11:20</td>
<td>Achieving Inclusiveness and Equity in the Farm Economy</td>
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<td>Dr. Hermanto Siregar</td>
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<td>Vice Rector, Bogor Agricultural University (IPB)</td>
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<td>and Member, Executive Council of the Indonesian Association of Agricultural Economics</td>
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<td>11:40</td>
<td>Integration of ASEAN Food and Agricultural System</td>
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<td>Dr. Suthad Setboonsarng</td>
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<td>Member, Board of Directors of the Cambodia Development Research Institute, and Member, Board of Trustees of the International Rice Research Institute</td>
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<td>Moderator: Dr. Maria Celeste H. Cadiz, SEARCA</td>
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<td>12:00</td>
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<td>1:30 p.m.</td>
<td>PARALLEL SESSION A</td>
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<td>PARALLEL SESSION B</td>
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<td>7:00</td>
<td>Cocktails</td>
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DETAILED CONFERENCE PROGRAM
Day 2 (13 November)

PLENARY 2 - In Quest of a Food Secure ASEAN Panel Discussion
with Recipients of the D.L. Umali Achievement Award in Agricultural Development

8:30 a.m.

Dr. Vo Tong Xuan, Vietnam
Dr. Charan Chantaklanthana, Thailand
Dr. Ramon C. Barba, Philippines
Prof. Dr. Ir. Sjarifudin Baharsjah, Indonesia

Panel Chair: Dr. Paul S. Teng, Principal Officer, National Institute of Education, Singapore

10:00 Coffee Break/Networking

10:30 PARALLEL SESSION C

12:00 Lunch

1:30 PARALLEL SESSION D

10:00 Coffee Break/Networking

3:30 PARTNERS FORUM - Toward Convergence for Resilient, Equitable, and Integrated Food and Agriculture Systems in Southeast Asia

4:30 SYNTHESIS/CLOSING PROGRAM

Synthesis | Theme Chairs
Theme 1: Productivity Improvement | Dr. Glenn Gregorio
Theme 2: Inclusive Value Chains | Dr. Rolando T. Dy
Theme 3: Sustainability & Poverty Reduction | Dr. Doris Capistrano & Dr. Percy Sajise
Theme 4: Food Security and Food Safety | Dr. Paul S. Teng
Theme 5: Institutions and Governance | Dr. Francisco P. Fellizar, Jr.,
Theme 6: Regional Cooperation and Integration | Dr. Nipon Poapongsakorn

Overall Synthesis and Way Forward | Dr. Cielito F. Habioto, Conference Technical Adviser and Coordinator
Closing Message | Mr. Vili A. Fuavao, FAO Deputy Regional Representative for Asia and the Pacific
FAO Regional Office for Asia and the Pacific

Master of Ceremonies: Dr. Bessie M. Burgos, Acting Program Head for Research and Development, SEARCA

Day 3 (14 November)

Field Trip (optional) to the IRRI Riceworld Museum, UPLB Campus,
and a farm in Tagaytay

Back-to-Back Events with ARD2014

10 November 14 November

Third Special Meeting of the ASEAN Technical Working Group on Agricultural Research and Development (ATWGARD)
Regional Cooperation towards Sustaining Climate Resilience in Crop Production in Southeast Asia
Best Western Plus Antel Hotel, Makati City, Philippines

27th Southeast Asian University Consortium for Graduate Education in Agriculture and Natural Resources Executive Board Meeting
New World Hotel, Makati City, Philippines
### PARALLEL SESSION A

**Session 1A - Plant and Animal Breeding** | Room Assignment - Makati A  
Convenor: University of the Philippines Los Baños (UPLB)

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<tr>
<th>Topic</th>
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<th>Institution</th>
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<tr>
<td>Plant Breeding for a Productive, Sustainable, and Resilient Agri-Biosystem</td>
<td>Dr. Eufemio T. Rasco, Jr.</td>
<td>Philippine Rice Research Institute</td>
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<td>Improvement of Local Breeds of Smallholder Livestock Farmers in Southeast Asia</td>
<td>Dr. Orville L. Bondoc</td>
<td>UPLB</td>
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<tr>
<td>Sustainable Use of Animal Genetic Resources in Developing Countries</td>
<td>Steve J. Staal</td>
<td>International Livestock Research Institute</td>
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**Session 2A - Farm Credits** | Room Assignment - Pasay A  
Convenor: Center for Agriculture and Rural Development - Mutually Reinforcing Institutions (CARD MRI)

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<th>Topic</th>
<th>Speaker</th>
<th>Institution</th>
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<tr>
<td>Role of MFIs in Strengthening the Agricultural Sector in Preparation for the 2015 ASEAN Integration</td>
<td>Dr. Jaime Aristotle B. Alip</td>
<td>CARD MRI</td>
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<td>Lao PDR’s Agriculture and Microfinance Sectors: Challenges and Opportunities in the ASEAN Integration</td>
<td>Mr. Somphone Sisenglath</td>
<td>Ekphatthana Microfinance Institution</td>
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<td>Cambodia’s Agricultural Sector and its Readiness for ASEAN Integration through the Microfinance Sector</td>
<td>Mr. King Kap Kalyan</td>
<td>SAMIC Plc</td>
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**Session 3A - Sustainable Agriculture** | Room Assignment - Rizal Ballroom  
Convenor: Asian Farmers’ Association for Sustainable Rural Development (AFA)

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<td>Ms. Le Nguyet Minh</td>
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<td>Mr. Roel R. Ravanera</td>
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<td>Policies to Attract the Youth to Agriculture</td>
<td>Ms. Ana P. Sibayan</td>
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**Session 4A - Food Safety and Nutrition** | Room Assignment - Pasay B  
Convenor: International Life Science Institute –Southeast Asia Region (ILSI SEA Region)

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<td>Dr. David I. Gustafson</td>
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<td>Harmonization of Standards for Food and Agriculture in ASEAN</td>
<td>Ms. Lara Vivas-Navarro</td>
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**Session 5A - Clustering and Cooperatives** | Room Assignment - Mandaluyong  
Convenor: Philippine Cooperative Center (PCC) and UPLB-Institute of Cooperatives and Bio-Enterprise Development (ICOPED)

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**Session 6A - Regional Food Security Systems and Investments** | Room Assignment - Makati B  
Convenor: SEARCA

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<td>Dr. Siang Hee Tan</td>
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<td>Ms. Pouchamarn Wongsanga</td>
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<td><strong>The Strategic Framework for AAS in the Philippines</strong></td>
<td>Dr. Maripaz L. Perez</td>
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## PARALLEL SESSION C

### Session 1C - Farm Mechanization/Irrigation and Water Management | Room Assignment - Makati A
Convenor: International Rice Research Institute (IRRI)

- **Mechanization in Rice Farming: Lessons Learned from Selected Countries and IRRI Case Studies**
  - Engr. Martin Gummert
  - International Rice Research Institute
- **The Never-ending Challenge of Managing Water Resources: Focus on a Half Century of Experience in Asia**
  - Dr. Randolph T. Barker
  - Cornell University

### Session 2C - Logistics Systems | Room Assignment - Pasay A
Convenor: Center for Food and Agri Business, University of Asia and the Pacific & SEARCA

- **The Indonesian Experience on Logistics Systems in the Supply Chain of Agricultural Products: Opportunities and Challenges**
  - Dr. Arief Daryanto
  - Bogor Agricultural University
- **Strengthening Markets of High Value Fruits and Vegetables in Mindanao: The Case of Transport and Shipping Service Improvement**
  - Dr. Gilbert M. Llanto
  - Philippine Institute for Development Studies
- **Enhancing ASEAN Connectivity: The ASEAN RO-RO Initiative**
  - Dr. Enrico L. Basilio
  - USAID COMPETE Project

### Session 3C - Climate Change Adaptation | Room Assignment - Rizal Ballroom
Convenor: Economy and Environment Program for Southeast Asia (EEPSEA)

- **Determinants of Household Decisions on Adaptation to Extreme Climate Events in Southeast Asia**
  - Dr. Canesio D. Predo
  - University of the Philippines Los Baños
- **Economic Analysis of Public and Autonomous Adaptation against Climate Hazards in Coastal Areas: Lessons from a Cross-Country Study**
  - Dr. Asa Jose U. Sajise
  - EEPSEA
- **Mediation Analysis of Factors that Influence Private Flood Mitigation Behavior in Developing Countries: Evidence from the Mekong Delta, Vietnam**
  - Mr. Phung Thanh Binh
  - University of Economics, Vietnam
- **The Role of the Asia Pacific Adaptation Network in Climate Change Adaptation**
  - Dr. Puja Sawhney
  - Asia Pacific Adaptation Network

### Session 4C - Disaster Management and Mitigation | Room Assignment - Pasay B
Convenor: Central Bicol State University of Agriculture (CBSUA) and FAO Philippines

- **Helping Farm Households Cope with Climate Change and Adverse Events**
  - Dr. Majah-Leah V. Ravago
  - University of the Philippines School of Economics
- **Mainstreaming Climate Risk Management and Disaster Preparedness in Local Governance for Food Security**
  - Dr. Cely S. Binoya, Prof. Vladimir R. Foronda
  - Central Bicol State University of Agriculture
- **FAO Response to Typhoon Haiyan in the Philippines: Relief, Rehabilitation, and Development for Resilience**
  - Mr. Aristeo A. Portugal
  - FAO Philippines

### Session 5C - ARD Innovation System for Eco-Efficient Agriculture | Room Assignment - Mandaluyong
Convenor: International Center for Tropical Agriculture (CIAT), Co-Organizer: National Academy of Science and Technology (NAST)

- **Innovation Systems for Eco-efficient Future of Asian Agriculture**
  - Dr. Dindo M. Campilan
  - CIAT
- **Decision and Policy Analysis for Eco-efficient Agriculture in a Changing Climate**
  - Dr. Peter Läderach
  - CIAT
- **Capacity Development and Institution Building for National Agricultural Innovation Systems**
  - Dr. Frédéric Lapeyrie
  - AGREENIUM
- **Session Commentary**
  - Dr. Gelia T. Castillo
  - National Scientist, NAST

### Session 6C - Higher Education and Capacity Building | Room Assignment - Makati B
Convenor: SEARCA and Regional SEARCA Fellows Association

- **The Role of Universities in Agriculture and Rural Development: The Case of Thailand**
  - Dr. Poopipope Kasemsap
  - Kasetsart University, Thailand
- **Higher Education for Sustainable Development: The Role of DAAD in the Region**
  - Ms. Janina Brill
  - German Academic Exchange Service (DAAD)
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| **Session 2D - Inclusive Value Chain of Agricultural Crops** | Room Assignment - Pasay A |
| Convenor: Center on Integrated Rural Development for Asia and the Pacific (CIRDAP) |
| Marketing of Fruits and Vegetables in Sri Lanka through Competitive Supply Chain Management | Dr. K.H. Sarananda |
| Supply Chain and Value Chain Development of Shallot in Indonesia | Dr. Y. Aris Purwanto |

| **Session 3D - Integrated Ecosystem Management** | Room Assignment - Rizal Ballroom |
| Convenor: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH |
| Integrated Ecosystem Management from Ridge to Reef | GIZ and Partners |
| Opportunities for Up-scaling Ecosystem-based Climate Change Adaptation Measures as Risk Management Strategy in Crop Production in Southeast Asia | Dr. Felino P. Lansigan |
| Identifying Agricultural Safeguard Areas—A Practical Example of a Climate Change Adaption Measure | Mr. Matthias Niggel |

| **Session 4D - S&T Collaboration for Food Security and Food Safety** | Room Assignment - Pasay B |
| Convenor: Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) |
| EU-Southeast Asia S&T Collaboration for Food Security: The CIRAD Experience | Dr. Alain Rival |
| The Importance of Multi-stakeholder Collaboration | Mr. Andrew McConville |
| Promoting Food, Agriculture, and Environment Education in S&T Collaboration for Food Security and Food Safety in Cambodia | Dr. Machito Mihara |

| **Session 5D - Land Markets and Land Tenure** | Room Assignment - Mandaluyong |
| Convenor: Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) |
| Land Reform with Asian Characteristics: Pros and Cons | Dr. James A. Roumasset |
| Comprehensive Agrarian Reform Program (CARP): Time to Let Go | Dr. Raul V. Fabella |

| **Special Session on Plant Health and Agricultural Extension** | Room Assignment - Makati B |
| Convenor: Centre for Agricultural Bioscience International (CABI) |
| Enhancing Sustainable Pest Management through Ecological Engineering Approaches | Dr. K.L. Heong |
| Plantwise: A Global Programme to Support Sustainable and Functional Plant Health Systems for Improved Food Security and Livelihoods | Dr. A. Sivapragasam |
| Tools and Ways for Effective Communication of Plant Health Research Findings | Dr. Qiaqiao Zhang |
PLENARY SESSIONS
Promoting agricultural and rural development (ARD) and reducing rural poverty call for an approach that recognizes the complexity of the sector, whose full understanding requires perspectives from a wide range of disciplines and multi-stakeholder perspectives. The 2nd International Conference on Agricultural and Rural Development in Southeast Asia (ARD2014) aims to provide a venue for sharing the wide and diverse knowledge pool on ARD within and beyond the Southeast Asian region, built on the theme “Strengthening Resilience, Equity, and Integration in ASEAN Food and Agriculture Systems.” Resilience or sustainability of food and agricultural systems is currently being tested against the challenges of rapid urbanization and social transformation, resource and environmental degradation, and heightened regional and global competition. Equity considerations, now commonly articulated in the phrase “inclusive growth” is a goal that must be pursued across countries and within countries in the region. Integration captures the ASEAN thrust toward closer regional political and economic coordination and cooperation, most prominently seen in the impending culmination of the ASEAN Economic Community in 2015. Six thematic areas will be addressed: (1) productivity improvement, traditionally approached through technological improvement at various components of the farm production system; (2) inclusive value chains, which considers the range of activities spanning farm finance and provision of farm inputs; logistics and value adding/processing activities; and moving the products to final consumers; (3) sustainability and poverty reduction, dealing with economic, social, and environmental sustainability of agricultural practices, while ensuring the upliftment of rural communities; (4) food security and food safety, dealing with the physical, natural, political/institutional, social/cultural, and economic dimensions of ensuring availability and accessibility of safe and nutritious food for all; (5) institutions and governance, examining the policy, regulatory, and institutional framework and its implications for the ARD system, and (6) regional cooperation and integration, situating ARD amid the impending culmination of the ASEAN Economic Community in 2015. Knowledge gaps in the food and agriculture systems of Southeast Asia remain substantial, and working together toward greater resilience, equity, and integration therein will require regular wide knowledge exchange across the region that ARD2014 aims to set in motion.

Cielito F. Habito is Professor of Economics at the Ateneo de Manila University, where he served as Director of the Ateneo Center for Economic Research and Development for 11 years. Currently, he heads the USAID Trade-Related Assistance for Development (TRADE) Project. He has served on the boards of various private companies and foundations, and is Chairman of Brain Trust Inc. and Operation Compassion Philippines. He also writes the award-winning weekly column “No Free Lunch” in the Philippine Daily Inquirer. As former Secretary of Socioeconomic Planning and head of the National Economic and Development Authority (NEDA), he served as the country’s chief economic planner in the Cabinet of President Fidel V. Ramos in 1992-1998. He has continued to help guide policy directions of the government of the Philippines and other Asia-Pacific countries in agricultural policy, regional development and sustainable development through work with various multilateral and bilateral development partners. He holds a PhD. and Master of Arts in Economics from Harvard University, Master of Economics from the University of New England in Australia, and Bachelor of Science in Agricultural Economics, Summa cum Laude from the University of the Philippines.
Toward Sustainability and Resilience in ASEAN Agriculture

Mr. Tin Htut Oo
Chairman, National Economic and Social Advisory Council (NESAC)
Myanmar
t.htut.oo@gmail.com

Represented by
Mr. Tin Aung Moe
Program Director
Myanmar Peace Center (MPC)

Southeast Asian economies with limited impact from global uncertainty and natural calamities are projected to perform robustly. But development is spread unequally and the region faces an issue of dual disparities, both among and within countries. Economic development policies and strategies, including those in the agriculture sector are required to shift away from traditional growth patterns and promote greener economies and address economic disparities. The challenge for ASEAN countries is to pursue economic development without creating additional burdens on ecosystems, thus conserving biodiversity and enhancing the welfare of both urban and rural populations.

ASEAN agriculture is highly vulnerable to climate change. An Asian Development Bank study on climate change estimated that, based on three criteria (level of biophysical exposure, sensitivity [share of labor employed in agriculture], and adaptive capacity [poverty, agricultural GDP]), irrigated rice production in Southeast Asia will decline by 17 percent. The scale of the impacts of climate change on ASEAN agriculture are significant, requiring a paradigm shift in agriculture development policies and strategies to promote climate-resilient agriculture.

On the other hand, with increasing income growth; growing middle class; rapid urbanization; changes in lifestyles and dietary patterns; as well as rapid regional integration, globalization, and trade liberalization; several drivers of change are emerging that generate opportunities and challenges for the ASEAN agriculture sector. There is also higher consumer awareness and growing demand for quality as well as hygienic and eco-friendly food and agricultural products.

New agricultural vision rather than business-as-usual approach is needed for ASEAN agricultural production systems to achieve the following:

1. Provide safe and adequate food and nutritional requirements
2. Provide sufficient income for farmers to sustain a comfortable standard of living
3. Protect ecosystems, including climate change mitigation and adaptation

The key concepts of this new agricultural vision are soil characterization, plant nutrient management, varietal development with the application of biotechnology, water management, transfer of knowledge and technology, post-harvest management, value addition, agricultural mechanization, and supply chain development. This will require substantial increase in agriculture investment through public and private sector harmonization, which will enhance the business sector for development.

Tin Htut Oo holds a Bachelor of Agriculture from the Institute of Agriculture, Mandalay and M.Sc (Agricultural Economics) from the Ohio State University. From 2001 to 2009, he was the Director-General of the Department of Agricultural Planning and before that held various posts in the Ministry of Agriculture and Irrigation since 1974. He retired from civil service in 2009. Currently he is serving as Chairman of the National Economic and Social Advisory Council and as the Economic Advisor at the Office of the President, Union of Myanmar. He is working as the Chairman of the Agriculture Group of Yoma Strategic Holdings Ltd., Singapore and CEO of the Agribusiness and Rural Development Consultants of FMI/SPA Group, Myanmar. He has worked with UN organizations as consultant and as Senior Advisor at the Office of the Executive Secretary, UNESCAP. He had also held executive committee member positions in regional bodies such as SEARCA, CIRDAP, and ASEAN (AMAF).
Achieving Inclusiveness and Equity in the Farm Economy

Dr. Hermanto Siregar
Vice Rector, Bogor Agricultural University (IPB)
Member, Executive Council of the Indonesian Association of Agricultural Economics
hermansiregar@yahoo.com

In many developing economies including ASEAN, structural transformation does not run smoothly. Many rural people, particularly those who grow food crops, are stuck in low productivity economic activities. These people are poor and in fact constitute a bigger portion of poverty headcounts. In contrast, modern sectors, including finance and a few manufacturing industries, perform considerably better than the agriculture sector. Globalization, furthermore, benefits more modern players in almost all sectors. As such, higher economic growth is attained with the costs of worsening inequality within a sector and among sectors. To correct this problem, agricultural policy needs to incorporate measures that explicitly improve the unequal income distribution. Macro and other non-agricultural policies need to be formulated in an inclusive manner, supporting the development of the agriculture sector rather than inducing the so-called back-wash effects to the sector. With back-wash effects taking place, benefits from such development are dominantly enjoyed by urban non-agricultural sectors while the agriculture sector and farmers are much less improved.

Hermanto Siregar obtained his bachelor degree in Agribusiness from Bogor Agricultural University, Indonesia in 1986, Diploma in Agricultural Economics as well as Master of Economics from the University of New England, Australia in 1990 and 1991, and completed his PhD in macro-econometrics from Lincoln University, New Zealand in 2001. Since 2007 he has been full professor in the Faculty of Economics and Management, Bogor Agricultural University, whereby he was also appointed as Vice Rector of the university since 2008. He has also been appointed by the President of the Republic Indonesia as an adviser, working in the Council of Economic Advisers since 2011. Currently he also functions as board member at Bank Rakyat Indonesia, the biggest Indonesian bank focusing on financing small and medium enterprises.
Integration of ASEAN Food and Agricultural System

Dr. Suthad Setboonsarng
Member, Board of Directors, Cambodia Development Research Institute
Member, Board of Trustees, International Rice Research Institute
suthad.setboonsarng@gmail.com

The integration effort started in 1995 when agriculture was included in the ASEAN Free Trade Area (AFTA). Traditionally, food is a national security concern and the farming sector is usually protected by trade policy. The sensitivity of this sector resulted in the creation of an additional mechanism, highly sensitive list (HSL), to allow more flexibility to a few selected products, especially for rice and sugar. In the spirit of mutual assistance, ASEAN has established the ASEAN Emergency Rice Reserve since 1979. It has been adjusted and expanded to include China, Japan, and Korea since 2002 and become the ASEAN Plus Three Emergency Rice Reserve (APTERR) in 2013. In the coming decades, the food and agricultural market in Asia will have to address four major changes, namely, the increase in demand for food (population and income increase), reduction of production areas (salinity, drought, pest, and diseases), reduction of agricultural workers (fewer and older farmers) and new business arrangements (cross-border value chain and regional business model). Global agricultural and food market is changing. New products are developed to meet the need of the middle-class which will be majority of the consumers. New methods of doing business are being invented to address the constraints in existing rules and regulations. Integration of the food and agricultural system is evolving to take advantage of the new shape and form to avoid the traditional sensitivity.

Suthad Setboonsarng is one of Southeast Asia’s top experts in international trade and investment. He has served as a leader in Thailand, ASEAN and in the private sector. His outstanding understanding of business and policy issues is augmented by an unmatched network among Thai and regional leaders. Prior to joining BowerGroupAsia, he was one of three Thailand Trade Representatives, a ministerial rank appointee, serving as a special representative of the Prime Minister of Thailand in coordinating and executing international trade, investment and other related key issues. Known as one of Thailand’s leading technocrats, he was appointed to his position in May 2009. Dr. Suthad is an expert on international trade and customs issues, especially the implementation of trade strategies in ASEAN. He was an ASEAN partner at PriceWaterhouseCoopers from 2000 to 2008. In that role, he assisted leading global companies and advised the Thai and ASEAN governments and the United Nations in developing their regional trade and investment policies.
Seven background points are particularly relevant for discussing food security in ASEAN. ASEAN countries generally do not rank high in comparative food security indices. One index, the Dupont-Economist Intelligence Unit Global Food Security Index of June 2014 ranks Singapore as 5th in the world and the most secure country in Asia, followed next by Malaysia at 34th. Food security robustness may be a more pragmatic concept to assess a country’s food security against many threats. Food security is affected by both “supply-side” (e.g., land, water) and “demand-side” (e.g., urban population) factors. The “demand side” of the food security equation will grow substantially from now to 2025, increasing the demand for key food items concomitant with the rise in per capita GDP. It is estimated that by 2050, Southeast Asia will have 766 million people, greater than 50 percent of whom will be in urban areas.

ASEAN has done a remarkable job to reduce poverty and increase the middle-class, yet one in 10 ASEAN citizens are still hungry. ASEAN countries are major producers of many food items despite the declining contribution of agriculture to gross domestic product, but concurrently ASEAN imports large amounts of maize, soybean and wheat from outside the region. Southeast Asia is regularly the top producer of rice, cashew nuts, and palm oil in the world, while trade in food products between ASEAN countries is relatively low compared to food exported outside the region. Yet ASEAN is home to many large agri-food companies. Many ASEAN countries have articulated self-sufficiency policies for selected food items (such as rice), yet in the short term, continue to be major net food importers. This is a paradox which makes little economic sense. Countries need to recognize that producing enough food is only one part of the equation to achieve food security. Countries need to recognize that food security is achieved only when all its dimensions (availability, physical and economic access, utilization, stability) are met, and this can best be achieved by involving many stakeholders and disciplines to tackle this issue.

Vo Tong Xuan
A scientist, educator, extension worker, administrator, and international servant in rural development and food policies for almost three decades, Dr. Vo Tong Xuan’s dedicated and committed service toward the promotion of diversified and sustainable agriculture, particularly in rice production, through his scientific publications, extension, teaching, and inputs to national policies has impacted the lives of millions of people, especially those in developing countries whose lives primarily depend on agriculture.

Dr. Xuan’s work at the grassroots, national, and international levels in the governmental, private, and non-governmental sectors contributed immensely to the transformation of the Vietnamese agricultural economy from a net rice importer to the world’s second largest rice-exporter. He was instrumental in disseminating the modern cultivation techniques of high-yielding rice varieties to the farmers of the Mekong Delta and his leadership helped farmers in the area to restore their production after the brown plant hopper (BPH) infestation that resulted in widespread food shortage among rice farmers.

He has assisted the governments of Cambodia, Myanmar, and Lao PDR on their agricultural policies and technologies. His expertise has likewise been sought by governments and farmers even beyond Asia.
Charan Chantalakhana
Prof. Charan Chantalakhana has tirelessly worked for the promotion of smallholder farming systems. His pioneering work on cattle and buffalo genetic improvement led to the development of a new cattle breed called “Kamphaeng Saen.” Needing lower levels of inputs and growing to weights three times those of the native cattle, the Kamphaeng Saen breed has helped small dairy farmers reduce the cost of production and expand dairy herds in Thailand, Cambodia, Laos, and Vietnam.
He initiated the establishment of the Thailand National Buffalo Center and Association, was a founding member of the Asian-Australasian Association of Animal Production Societies (AAAP), and a co-founder of the Asian Buffalo Association (ABA).
Throughout his career, Prof. Charan has actively mentored students and trainees in the field of animal science and genetics, many of whom now hold key positions in Thailand and elsewhere in Southeast Asia. He has continued to work with young scientists and farmers, forming a group of researchers from universities and smallholder dairy farmers to investigate the impacts of smallholder dairy farms on the environment and waste management.

Ramon C. Barba
The ability to perceive practical solutions to bear on complex problems, his innovativeness, diligence and persistence have helped Dr. Ramon C. Barba bring world-class modern science to empower small farmers in the Philippines and other parts of the world.
His inexpensive and easy-to-use mango flower induction technology overcame the biennial and erratic fruit-bearing characteristics of mango, thus making the mango fruit available all year round. Dr. Barba's prolific scientific work extended to banana as well, for which his team developed the technique of micro-propagation to provide the sector with disease-free planting materials.
His technologies have had unprecedented impact on both the small farmers and the agro-processing sector, not only in the Philippines, but in other countries beyond Asia.
Dr. Barba has been conferred the Order of National Scientist by President Benigno S. Aquino III in 2014 for his significant contributions to the field of science and technology.

Sharifudin Baharsjah
Dr. Sharifudin Baharsjah is an outstanding development advocate and public servant who led efforts to promote food security in Indonesia through policies and measures, particularly the agribusiness approach, effectively increasing productivity of rice farms and uplifting the welfare of Indonesian farmers.
In his term as Minister of Agriculture of Indonesia, his fearless pursuit of a ban on 19 pesticides ineffective in controlling brown plant hoppers, led to the promotion and adoption of a natural equilibrium approach to controlling pests and diseases through farmer field schools. Natural equilibrium meant savings for farmers in addition to being a boon to human health and the environment.
His commitment to nurture minds and provide opportunities for others have led him to build institutions that undertake research, provide policy support, work with farmers, and provide scholarships, among others, to contribute to development not only in Indonesia but in all of Southeast Asia.

The Dioscoro L. Umali Achievement Award in Agricultural Development intends to underscore the importance of agricultural development in Southeast Asia by recognizing exemplary individuals who have contributed to its advancement in the region. It was named in honor of the late Dr. Dioscoro L. Umali who was an educator, institution-builder, development champion, and prime mover of agricultural and rural development in Southeast Asia in his time. He was also the founding director of SEARCA, former Assistant Director-General of the Food and Agriculture Organization of the United Nations, and a National Scientist of the Philippines, whose quest for excellence fueled a vision for a progressive Southeast Asia.
To date, four individuals from Vietnam, Thailand, the Philippines, and Indonesia have been the recipients of this award. They have shown excellence in the exercise of their profession; exemplary character in their relationships with great and ordinary people alike; an active social conscience which seeks to improve the lot of the human beings, institutions, and societies they are able to reach; and the trust and respect of the agriculture and rural development community as a whole. The award, launched on 27 November 2007, is a collaboration among SEARCA, the National Academy of Science and Technology, Philippines (NAST, Philippines), and Dioscoro L. Umali Foundation (DLUF).
PARALLEL SESSIONS
University of the Philippines Los Baños (UPLB)

UPLB, a coeducational, publicly funded academic, research, and extension institution, is one of the six constituent universities of the University of the Philippines System. It started out as a College of Agriculture in 1909; and became a full-fledged university in 1972. It has emerged as a leading academic institution in Southeast Asia. UPLB is dedicated to advancing knowledge and educating students in science, technology, agriculture, forestry, veterinary medicine, and other areas of scholarship that will best serve the Filipinos and humanity in the 21st century. Its outstanding achievements in the basic and applied sciences are testaments to the great strides it has made for the past 90 years. Its alumni continue to be prime movers in academe, in government, and in business.

www.uplb.edu.ph
Plant Breeding for a Productive, Sustainable, and Resilient Agri-Biosystem

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Plant breeding in the past aimed to develop varieties with limited regard for crop integration in a complex agri-biosystem. This paper argues that this approach fails to exploit the full potential of the crop as well as that of the other components of the natural or synthetic system.

Achievements in the direction of crop variety integration to its environment so far gave the world the series of agricultural revolutions in recent years. Among these are breeding for adaptation to biotic and abiotic stresses, and breeding for adaptation to photoperiod and temperature. These achievements consider the environment as a challenge to be surmounted or a problem to be solved. The breeding objectives do not consider positive interactions between the crop and other biological components of the crop environment, primarily because of the dominant monoculture orientation of crop production.

With the realization that natural resources are limited, the monoculture orientation is no longer tenable. Carefully designed plant and animal mixes, in harmony with other components of the biological environment, can produce more from the same land and water resource than any single crop.

Plant breeding in the future must look at the environment in a more positive light. Indeed, a great majority of the components of the biological environment are beneficial but relatively little work has been done in enhancing their beneficial interaction with the crop by way of breeding crops that are better suited for this interaction. This paper will argue that plant breeding in the direction of enhancing variety interaction with other creatures in a given agri-biosystem is possible for increased productivity not only of the subject crop. It is also beneficial to the overall productivity, sustainability, and resilience of the agri-biosystem where the crop is grown.

Eufemio T. Rasco, Jr., Executive Director of Philippine Rice Research Institute (PhilRice), advocates energy in rice farming, coping with climate change, and rural transformation through a science-based support system for rice farmers. He has a PhD in Plant Breeding from Cornell University, and is an academician of the National Academy of Science and Technology, scientist, and R&D administrator. His decades in research and public education at the University of the Philippines have inspired him to address young minds’ curiosity toward plant biotechnology and other scientific farming practices. He pays attention to neglected plant species (sago, dragon fruit, pitcher plant, and nipa); has bred hybrid varieties of vegetables still used today in Asian countries, 25 years since their introduction; proposed for and became editor-in-chief of the multi-disciplinary journal, Banwa; founding research director of East-West Seed Co.; headed the UPLB Institute of Plant Breeding; and helped the International Potato Center in Asia to grow.
Animal production in intensive or conventional systems is often associated with high-energy concentrate feeding; regular, prophylactic veterinary treatments; and the use of exotic livestock breeds. Such livestock, however, may not be optimally adapted to the low-input farming system of poor smallholder farmers who dominate ownership of the domestic animal inventory in the Philippines and other agricultural countries in Southeast Asia. Preference is therefore given to local (indigenous) breeds that are more resilient to climatic stress and are more resistant to local parasites and diseases, thus ensuring healthy and stress-free animals.

Local breeds are important sources of genetic variation especially those associated with unique product quality or other special characteristics. They may be used in generating heterosis effects in commercial crossbreeding programs and are the focus of environmental conservation programs as local livestock biodiversity represents our natural and cultural heritage. More importantly, local breeds are the basis of livelihoods and therefore contribute to food security in marginal areas.

Breeding strategies for local breeds of buffalo, cattle, goat, pig, chicken, and duck should be able to ensure farm profitability, safeguard animal health and welfare, focus on conserving genetic diversity, and promote human health. A farm-specific breeding program for local breeds operated by a community-based organization for the genetic improvement of livestock is recommended to reduce farmers’ dependence on major breeding companies. Unlike the limited number of traits in intensive or conventional livestock production, the breeding objectives for the local breeds may consider a broader range of attributes that can further the development of adaptive traits through purposive selection. Local breeds should thus be continuously exposed to local conditions to maintain their unique adaptive traits. The local breeds in Southeast Asia should also be linked with local and/or regional marketing strategies to account for special quality of livestock products and the protection of their geographical indications and designations of origin.
The choice of genetics for livestock production is dependent on the context and type of production system: smallholders typically employ a “household model” of production and marketing and the large producers use an “enterprise model.” The first is characterized by working to achieve multiple objectives besides income, including risk reduction, diversification, insurance, and social capital; maximum use of low cost resources; and farm synergies. In contrast, the latter is oriented to produce for profit and is often managed with intensive capital, mechanization, and economies of scale. The contrasting production conditions and objectives in both models are interlinked with their diverse requirements for animal genetic resources, and lead to different issues and challenges for the long-term development and utilization of animal genetic resources (AnGR).

Smallholder farmers, like others, select the genotype of their livestock largely due to need for greater productivity and for private benefits. On the other hand, society wants to maintain AnGR for long-term public benefit. The main issue now is, “Is it then fair to ask farmers to maintain the public goods embedded in AnGR and to forego productivity gains and income?” To reconcile these two seemingly contradictory objectives is a challenge for AnGR management. Animal genetic requirements for the industrial system, which are shaped by their ability to manage the environment means less demand for breeds adapted to local environments or disease resistance, more demand for production efficiency to maximize benefit, and more demand for quality traits due to consumer demand and technical requirements. Support to sustainable conservation includes increasing profitability by enhancing market and non-market values, derived both from private and public sources; employing a multi-faceted range of technological alternatives and opportunities by exploiting new technology through research; facilitating policies and services including animal health; and co-evolving livestock production systems and animal genetic resources. Important tools for this sort of co-evolution are now available through genomic editing. Increased and coordinated investment in identifying and making use of the underlying genetic variation in tropics livestock is also important.
CARD MRI provides continuous access to financial, micro insurance, educational, livelihood, health, and other capacity-building services that eventually transform them into responsible citizens for their community and the environment. Based in San Pablo City, Laguna, Philippines, with 1,598 offices located all over the country and with liaison offices in Cambodia, Vietnam, Laos, and Myanmar, and a program office in Hong Kong, CARD MRI now has 2,500,780 members and clients as of July 2014.

www.cardmri.com
Role of MFIs in Strengthening the Agricultural Sector in Preparation for the 2015 ASEAN Integration

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Microfinance has proven to be a vital component in the fight against poverty in countries around the world. Through microfinance, the poor are provided financial access for a productive livelihood, which commercial financial institutions cannot directly provide. Globally, microfinance is growing in terms of outreach, loan portfolio, and savings. Asian microfinance institutions (MFIs) have remained strong through the years and have provided agricultural microfinance to its clients, realizing its importance to poverty eradication. In the Philippines, one of the MFIs that supports the importance of providing agricultural microfinance is CARD MRI.

MFIs find the agricultural sector a challenging terrain, some still offer products and services to clients whose businesses are agricultural in nature. MFIs are aware that those in agriculture are among the most disadvantaged and thus need assistance. MFIs help farmers through the provision of an agri-loan product, which in the Philippines where farming and production of farm related products are income sources of many Filipinos, can prove to be successful.

The use of a holistic approach in projects has likewise been found beneficial. CARD MRI believes in fighting poverty through both financial and social development programs, which include education, microinsurance, and product development and marketing. CARD MRI with Pioneer Group implemented the CARD Crop Assistance Program (CCAP) to provide valuable safety nets to clients whose agricultural business has been damaged by natural calamities. It also implements training for staff on the agri-loan program and education modules for members. It also finds markets for the farmers’ produce. CARD MRI through its, CARD-Business Development Foundation Inc. links clients to individual and institutional buyers in order to provide them with continuous market.

With the nearing ASEAN integration and the readiness of countries in question, MFIs can link farmers to institutions that provide agricultural information and technology and develop/strengthen education programs from farm inputs to farm management. Furthermore, MFIs can assist in direct market linkage so farmers could be connected to the local and global supply chain. In the process, product development can be provided to assist clients on handling and packaging that would make their products be at par with other global products.

Jaime Aristotle B. Alip is the Founder and Managing Director of the Center for Agriculture and Rural Development Mutually Reinforcing Institutions (CARD MRI), and the 2008 Ramon Magsaysay Awardee for Public Service. Under Dr. Alip’s leadership, CARD MRI also received numerous other awards from 2000 to 2012, including the Global Excellence for Microfinance by the Grameen Foundation, USA. Dr. Alip has served in key positions in the Philippine Government and continues to hold various positions in local and international organizations working on microfinance and rural development. He has extensive international experience in these fields throughout Southeast Asia plus Bhutan and China, serving in various capacities as advisor, expert, and/or consultant. Dr. Alip is an alumnus of the Harvard Business School having completed the Owner/President Management (OPM) Program in 2007. He obtained his doctorate degree in Organizational Development from the Southeast Asia Interdisciplinary Development Institute (SAIDI), Philippines in 2002. He received his bachelor and master’s degrees in agricultural economics/marketing from the University of the Philippines at Los Baños in 1978 and 1983, respectively.
Lao PDR’s Agriculture and Microfinance Sectors: Challenges and Opportunities in the ASEAN Integration

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Microfinance providers in Lao PDR belong to the formal, semi-formal, and informal financial sectors. In the formal sector, the state-owned Agricultural Development Bank (APB) is the major institution involved in microfinance. The semi-formal sector is dominated by credit unions and cooperatives, and development projects funded by bilateral and multilateral aid, and implemented by government programs, local or international nongovernment organizations. The informal sector is composed of rotating savings and credit associations (RoSCAs), loans from family and friends, and money lenders.

Ekphatthana Microfinance Institution (EMI) is among the formal providers and is the first licensed microfinance institution and operate in Lao PDR under the government’s microfinance regulations issued in 2005. It envisions to be the leading microfinance provider of innovative, valuable, and stable financial and non-financial services to empower clients and their other stakeholders. Created as a private Lao company with a start-up capital of USD 100,000 from 10 shareholders, EMI’s operations and clientele have grown steadily over the years.

Formal microfinance providers in Lao PDR play a vital role in the agriculture sector because of high percentage of those with access to informal money lenders and with Lao PDR as a highly agriculture country. Although EMI has a low percentage of borrowers who are directly using loans for agriculture businesses, borrowers are into micro agricultural activities such as vegetable planting and chicken and duck raising.

However, like other formal providers in Lao PDR, there are challenges in providing agricultural loans, which include frequent flooding, high competition between Lao farmers and farmers from other countries who can produce big volumes at low cost, lack of flexibility due to monthly payment modes, and linkage with agriculture extension support. EMI is steadfast in its plan to create a more flexible type of loan to fit the agricultural financial needs of the clients as well as to find ways to address other challenges. It has partnered with CARD MRI toward these ends.

The coming of the ASEAN integration can be both a threat and an opportunity to the micro/small farmers. EMI looks forward to the challenge with support from strong partners from ASEAN countries.

Somphone Sisenglath is founder and Managing Director of Ekphatthana Deposit Taking MFI and Microfinance Center Laos. He has explored the full range of microfinance models implemented in the Lao PDR and has conducted Microfinance Best Practice Trainings to more than 500 participants with practitioners and policy makers. He has shared his expertise as a Microfinance Consultant to several projects of ADB, World Bank, UNDP, EU and other INGOs in Lao PDR. Somphone has an MBA in International Business from the Asian Institute of Technology in Bangkok in 1998. He also served as Co-Chairman of Lao Microfinance Working Group 2008-2010.
Cambodia’s Agricultural Sector and Its Readiness for ASEAN Integration through the Microfinance Sector

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Microfinance plays a big role in agriculture in Cambodia, whether through direct intervention to farmers for the pre-harvest finance; to sole proprietors, cooperatives, or SMEs for inventory finance; or for trade finance, which also involves distribution.

SAMIC, one of the bigger microfinance institutions in Cambodia, aims to contribute to poverty reduction and improve the living conditions of poor Cambodians. Its mission is to provide financial services and products to rural and urban poor at the most affordable prices while ensuring its long-term sustainability. Over the years, SAMIC has grown to over 19,000 clients and a loan portfolio of over USD 10 million.

Microfinance institutions in Cambodia, like SAMIC, play a vital role in empowering the microfinance sector and its stakeholders, particularly those in the agricultural sector, through the provision of microfinance products, microinsurance, health, and education. It provides entrepreneurship skills and knowledge as well as SME empowerment through direct financial intervention and education.

Aside from the direct intervention of microfinance on the agriculture sector, other financial institutions have also been instrumental in the development of the agricultural sector such as the National Bank of Cambodia (NBC) and the Rural Development Bank (RDB), and a number of commercial banks, which provide financial support to multiple projects such as rural microfinance, family rubber plantation, farmer communities, agriculture development associations, and small and medium enterprises.

With the nearing ASEAN Integration, MFIs in Cambodia can help prepare micro businesses, small businesses, and SMEs to be at par with the other ASEAN member nations.

King Kap Kalyan is the Chief Executive Officer of SAMIC Plc, a licensed microfinance institution, which provides financial services and products throughout Cambodia toward poverty alleviation. Mr. Kalyan had likewise served as its President and was General Manager when it was still known as SAMIC Limited. Prior to his involvement in microfinance, Mr. Kalyan was an Officer of the National Bank of Cambodia. Mr. Kalyan has Master’s degrees in Organizational Development, with focus on field microfinance management and business management. His undergraduate degree is in banking and finance. He has received training on various aspects of microfinance and its administration and various facets of banking and finance.
Asian Farmers' Association for Sustainable Rural Development (AFA)

AFA is a regional alliance of 17 national federations and organizations of small farmers and producers in 13 countries in Asia (two in South Asia, two in Central Asia, three in North Asia, and six in Southeast Asia). It was established in 2002 after a series of farmers' exchange visits (FEVs) where farmer leaders saw the great need to come, share, learn, and act together toward their common desire for a better quality of life for themselves, their families, and their farming communities.

AFA's programs to support its members include: policy advocacy; knowledge management and sharing; enterprise development and marketing through technical and managerial support to members and linking to markets; and governance—maintenance and upgrading of transparent, democratic, effective, efficient, and sustainable organizational systems and processes for decision making and management.

AFA envisions rural farming communities that are self-reliant, educated, happy, healthy, peaceful, and prosperous—free from hunger and poverty.

www.asianfarmers.org
Farmer-led Agricultural Innovation for Resilience: The Case of System of Rice Intensification in Vietnam

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Approximately 80 percent of the world’s hungry people live in rural areas, where most depend on food production for their livelihoods. As FAO described, however, agricultural development strategies typically focus on high-input, large-scale systems. Yet ongoing food security concerns, coupled with the emerging climate change threat, call for a shift to demand-driven approaches that prioritize vulnerable farmers, especially women, and sustainable agriculture farming strategies.

There is an urgent need to find ways to address the barriers faced by smallholder farmers that goes beyond the occasional small pilot to creating systemic change. Often seen as local level actors, nongovernment organization contributions in fact go beyond the narrowly defined “local” to influence various levels needed to bring about systemic change. Oxfam, an international development organization, has been working with civil society partners and the government of Vietnam to make the system of rice intensification (SRI) available to smallholder rice producers across Northern Vietnam at a scale hitherto unachieved. Field experience elsewhere also suggested that SRI had the potential to help small-holder farmers improve agro-ecological crop performance and their profit margins. This paper aims to provide some insights into the program that makes scaling-up possible. It looks into challenges and opportunities in creating a viable enabling environment for SRI adoption. Different pathways for an enabling environment are examined.

The paper concludes that low-carbon, sustainable rice production must have several dimensions: investments in quality, farmer-focused extension services, quality control of input services and trade facilitation, coordination on a national scale, incorporation of monitoring mechanism, and well-defined research agenda.

Le Nguyet Minh is Oxfam America’s Global Advisor on Agriculture. She is an economist with 18 years of experience. Le has managed programs on livelihoods and income security for smallholder farmers, partnership and public governance, pro-poor markets, building civil society in various countries, in particular in the Greater Mekong Sub-Region. Le has held positions with various international development organizations, including DFID, World Bank, and FAO. For the past five years, her work has concentrated on agricultural policy issues and economic justice for the rural poor. Le holds a Master of Arts major in Development Economics from Williams College.
The Multiple Goods and Services of Asian Rice Production Systems

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The review assessed the multiple benefits of Asian rice ecosystems given the critical importance of rice cultivation in the global and local food economies.

It identified six agro-ecological systems and their core practices applicable to Asian rice production: conservation agriculture, holistic heritage systems of agriculture, integrated farming systems, integrated pest management, organic agriculture, and system of rice intensification.

The benefits of these systems were then assessed to characterize their observed effects on yield and thirteen ecosystem services, which include diet diversity; carbon sequestration; cultural services; energy provision; genetic diversity; mitigation of greenhouse gases; pest control; resilience to climate disturbance; soil structure, fertility, erosion control; water quality; water quantity; weed control; and wild biodiversity and habitat provisioning.

The review covered 155 studies that include both peer-reviewed scientific literature and non-peer reviewed “grey literature” such as project reports and student theses.

The review concluded that, in the majority of cases, yields of rice production systems do not need to be sacrificed when the systems are managed to generate other ecosystem services. Overwhelmingly, in all systems, the predominant outcome has been “win-win”: higher yields as well as greater generation of ecosystem services. There is a need, however, for favorable policy environments to support the growth and uptake of these holistic farming systems.

Roel R. Ravanera is currently the Executive Director of the Xavier Science Foundation, a foundation that closely works with Xavier University (Ateneo de Cagayan) and other development partners in northern Mindanao. It supports outreach programs and researches in the fields of sustainable agriculture, asset reform and natural resource governance, food processing, renewable energy, and environmental conservation. He was former Dean of the College of Agriculture of Xavier University. Mr. Ravanera holds an MSC in Agriculture major in Environmental Resource Management from the University College Dublin, Ireland. Mr. Ravanera has written a number of papers and articles. Examples of his recent work include Commercial Pressures on Land in Asia: An Overview (with Vanessa Gorra) published by the International Land Coalition, IFAD, and CIRAD; Sustainable Agriculture as Potential Tool for Poverty Reduction in Asia (with Aquilina Galang and Grace Santos); and “Impending Tarrification of Rice,” an article in the book Trade Liberalization, Agriculture and Small Farm Households in the Philippines.
In May 2014, the Asian Farmers’ Association for Sustainable Rural Development (AFA) held a regional sharing on youth in agriculture among its members to identify issues and problems, share initiatives, and come up with policy recommendations on attracting youth to agriculture. These policy recommendations were drawn from national consultations, participatory researches, and the resulting policy proposals by AFA members on the issue.

Among the issues highlighted were the migration of youth to cities due to lack of opportunities in rural areas and low income from farming due to lack of access to basic means of production and effective government policies in support of agriculture.

While there were some initiatives such as training and support for various sustainable agriculture technologies that help reduce the cost of input, and programs to support youth who want to go into agriculture and training programs through cooperatives, several recommendations were identified pertaining to capacity building, organizational development, policy advocacy, and partnership with various actors.

The needed support to attract the youth to agriculture that were identified include: capacity building (e.g., training on constructive engagement, youth education, scholarship programs, etc.); research (e.g., comparative study of the use of organic and non-organic fertilizers, policy research on incentives for young farmers, research on impacts of climate change, etc.); technical support (seeds, production techniques, etc.); policy advocacy promoting agriculture (soft loan for young farmers, ASEAN agricultural bank, right to seeds, campaign on land, etc.); and regional exchange program (youth farmers’ gatherings, farmer exchange, etc.).

This paper further systematizes the results of the national and regional consultations, participatory researches and policy proposals, and presents findings from a desk study on the issues surrounding youth in agriculture in the region.
International Life Sciences Institute Southeast Asia Region (ILSI SEA Region)

ILSI SEA Region is a regional branch of the International Life Sciences Institute (ILSI), a nonprofit, worldwide organization whose mission is to provide science that improves human health and well-being, and safeguards the environment. ILSI is affiliated with the World Health Organization (WHO) as a non-governmental organization and has specialized consultative status with the Food and Agriculture Organization of the United Nations (FAO). ILSI’s activities focus primarily on nutrition and health promotion, food and water safety, risk science and toxicology, and sustainable agriculture and nutrition security.

ILSI SEA Region initiates and coordinates scientific programs, research, as well as knowledge and information dissemination in Southeast Asia, Australia, New Zealand, and the Pacific Islands. Headquartered in Singapore, ILSI SEA Region oversees a Country Office in Australia, as well as Country Committees in Indonesia, Malaysia, the Philippines and Thailand.

www.ilsi.org/SEA_Rregion
Assessing Sustainable Nutrition Security: The Role of Food Systems

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Sustainability considerations have largely been absent from most food security assessments conducted to date, despite the tremendous economic, environmental, and social implications of meeting accelerating food demand amidst changes to climate and freshwater availability. In addition, previous food security work has generally focused on caloric availability, rather than addressing such issues as dietary diversity, over-consumption, and micronutrients (so-called “hidden hunger”), all of which are absolutely critical to maintaining a healthy overall nutritional status. In response to these limitations of existing assessments, a new methodology has recently been proposed, based on the notion of “sustainable nutrition security.” This novel assessment methodology is intended to remedy both kinds of deficiencies in the previous work, by defining seven metrics for characterizing sustainability and dietary quality outcomes of food systems. These include the following: (1) caloric and nutrient adequacy; (2) dietary quality; (3) dietary diversity; (4) dietary sustainability; (5) consumer choice; (6) resiliency of the food system; and (7) overall food system sustainability. Steps toward the development and testing of these new metrics are described in this paper. Once completed, this novel assessment methodology can be deployed to evaluate the impact of potential food system interventions intended to improve sustainability and human nutrition outcomes.

Dave Gustafson serves as Director for ILSI Research Foundation’s Center for Integrated Modeling of Sustainable Agriculture and Nutrition Security (CIMSANS), the purpose of which is to foster new public-private partnerships on improving scientific understanding of how climate change and resource scarcity impact sustainable nutrition security. Dave’s academic training was in chemical engineering (Stanford, BS, 1980; University of Washington, PhD, 1983). He spent 30 years in private industry (Shell, Rhône-Poulenc, and Monsanto) before becoming Director of CIMSANS. His initial focus was predicting agricultural impacts on water quality. In subsequent years, Dave developed new modeling approaches to pollen-mediated gene flow, population genetics of insects, and weed resistance. Beginning in 2007, Dave began to focus on how climate change impacts agriculture. He has served on various national and international teams looking at this issue, including the Executive Secretariat of the US Government’s National Climate Assessment Development and Advisory Committee.
Harmonization of Standards for Food and Agriculture under ASEAN

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The Philippines has been actively pursuing harmonization activities geared toward meeting the ASEAN Economic Community Blueprint item A.7, that ASEAN Member States should develop regional and national standards for food, agriculture, and forestry with significant trade impact or potential; to include management based standards, production safety standards, and quarantine and inspection requirements. For the agriculture sector, several horticulture and food crop standards have been developed for the ASEAN by the Task Force on ASEAN Standards for Horticultural Produce and Other Food Crops (TF-MASHP). Likewise, ASEAN Good Agricultural Practices (ASEAN GAP) have been developed with their implementation being supervised by the Experts Working Group on GAP (EWG GAP). Two other codes of practice, the ASEAN Good Animal Husbandry Practices (ASEAN GAHP) and the ASEAN Good Aquaculture Practices (ASEAN GAqP) are being developed and finalized in time for the AEC 2015 deadline. Likewise, the Special Task Force on ASEAN Standards for Organic Agriculture (TF-ASOA) has been able to finish the ASEAN Standards for Organic Agriculture. These collaboration work on ASEAN standards are aimed toward ensuring a harmonized and equivalent food safety regime for the region.

Ms. Lara Vivas-Navarro is a graduate of BS Food Technology from the University of the Philippines in Diliman and holds a Diploma on Supply Chain Management from the Supply Management Institute of the Philippines. She currently serves as the OIC-Chief Science Research Specialist (SRS) of the Standards Development Division of the Philippine Bureau of Agriculture and Fishery Standards (BAFS). Among her tasks include the supervision of the development of various Philippine National Standards for agriculture, fishery, and mechanization. Likewise, she serves as the technical secretariat for the Special Task Force on ASEAN Standards for Organic Agriculture (TF-ASOA) and assists in the work of the Task Force on ASEAN Standards for Horticulture Produce and Other Food Crops (TF-MASHP). Ms. Navarro also serves as the focal person on Good Agriculture Practice for Rice (GAP Rice) and Code of Hygienic Practice for Natural Ingredients.
The Philippine Cooperative Center (PCC)
The Philippine Cooperative Center (PCC) was formally registered as an apex tertiary cooperative on 10 March 1997, which coincided with the Cooperative Day celebration. It is composed of leading national and regional and large primary cooperatives all over the country. Its mission is to promote social justice and eliminate poverty. It serves as a unifying center that strives for excellence and competitiveness, create partnerships, and ensure the accountability of the cooperative movement. PCC believes that in order to realize these goals, cooperatives must integrate their social and economic activities.

To fulfill these goals, PCC is working toward: (1) an integrated co-op financial system; (2) integrated marketing and information system; (3) national integrated co-operative advocacy, education, and information system; and (4) transforming public utilities and services into genuine cooperatives.

PCC is the convenor of the 7th, 8th, 9th, and 10th National Cooperative Summits. It sponsors common agenda-building activities among co-op networks through its committees on policy, technical, and business development cooperation.

www.philcoopcenter.coop

UPLB Institute of Cooperatives and Bio-Enterprise Development (UPLB-ICOPED)
ICOPED, an academic unit under the College of Economics and Management, University of the Philippines Los Baños (CEM-UPLB) provides a strong focus on the development of cooperatives as viable economic and social enterprises. Formerly the Agricultural Credit and Cooperatives Institute (ACCI), its strength is rooted in decades of relevant experience in implementing academic and training programs and networking with the cooperative sector, government agencies, and nongovernment organizations involved in cooperative development work. It is supported by the manpower and physical resource pool of CEM-UPLB to provide relevant instruction, research, and extension programs.

Its vision is to be a center of excellence for instruction, research, and extension in the field of cooperatives and bio-enterprise development in the Philippines and Asia. Its mission are to help produce graduates with academic background and professional skills in managing cooperatives toward bio-enterprise development; undertake research and extension programs that support policy-making for and enhancing cooperatives’ role in sustainable and broad-based development; serve as link between UPLB and the government and private sector on public policy and technical assistance in the promotion of cooperative business enterprises.

www.philcoop.net/icoped
How Ready are the Philippine Agricultural Cooperatives for the ASEAN Economic Community?

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Soro-Soro Ibaba Development Cooperative

The Association of Southeast Asian Nations (ASEAN) envisions to fully achieve the ASEAN Economic Community (AEC) by 2015 with the view of having a single market and production base, a highly competitive region, a region of equitable economic development, and a region fully integrated into the global economy. As a member country, the Philippines is committed to be part of the AEC. With the country’s achievements and progress in meeting its AEC commitments, contributions have been made to the development of its agriculture sector—a vital player in Philippine economic development. However, literature show that the impacts of the country’s actions toward AEC have been uneven within the agriculture sector. Some sectors involved in agriculture benefit while others are disadvantaged. Some are ready to adapt to changes while others are resistant. Some are contributory to the achievement of AEC goals while others cause impediments.

The interest of this paper is to shed light on the implications of AEC commitments on one of the significant players in the Philippine agriculture sector—agricultural cooperatives. The AEC Blueprint has the hopeful goal of transforming the Philippine agriculture into a modern, dynamic, and competitive sector. In this path, it has emphasized the important role of agricultural cooperatives, particularly in terms of enhancing market access of agricultural products, technology transfers, strategic alliances and business linkages, and standards harmonization. Having an understanding of the benefits, challenges, and opportunities that AEC has posed on this sector would be essential in describing the readiness and capability of local agricultural cooperatives in operating under and contributing to the AEC objectives. This paper hopes to provide a discussion where policy implications can be drawn to improve the readiness of agricultural cooperatives for AEC and to optimize their potentials as a key driver in achieving AEC.

Rico B. Geron is the Chief Executive Officer of the Sorosoro Ibaba Development Cooperative (SIDC), Sorosoro Ibaba, Batangas City and the Agricultural Sector Alliance of the Philippines (AGAP) Partylist Representative in the 16th Philippine Congress. He held various positions in SIDC prior to his becoming its CEO. He currently also serves, in various capacities, different organizations focused on cooperatives, corn, feedmills, and hog growing, and is a favored resource person on these and related topics. He has various Committee Memberships in the House of Representatives, including Millennium Development Goals, Agrarian Reform, Aquaculture and Fisheries Resources, Cooperatives Development, and Food Security. Rep. Geron earned his Master in Entrepreneurship for Social Development from the Asian Institute of Management 2003. He has a BS Customs Administration from Lyceum of Batangas in 1986 and was the school’s Achievement Awardee in 2007.
Clustering Approach to Agroenterprise Development: The Coop Experience

Engr. Sylvia Okinlay-Paraguya  
Chief Executive Officer  
National Confederation of Cooperatives (NATCCO)

Ms. Joan Cua Uy  
Consultant  
Catholic Relief Services

The paper highlights how cooperatives accompanied a group of farmers to produce the high value vegetables needed by a pre-identified market. Without being boxed in by just the usual credit assistance to the individual members, the cooperative invested in hiring development officers trained to accompany the farmers in their journey to deliver their products to the market. Partnership at different levels have been maximized to ensure that the farmers are accompanied along the whole value chain. The individual members of the cooperative have been clustered to produce an identified product based on the volume and timing needed by the market.

The paper also provides the overview on Philippine cooperatives, noting that more engagement and/or successes of the Philippine cooperatives is in savings and credit operations. In fact, the present listing of the types of cooperatives does not include agriculture cooperatives but rather specific types of agri-based cooperatives. Multi-purpose cooperatives comprise 63 percent of the total 23,355 cooperatives in the country. Thus, the paper will provide the framework on how the existing viable multi-purpose cooperatives can become agents in the agro-enterprise development of their individual members, through the clustering strategy.

Joan Cua Uy finished her Bachelor’s degree in Agriculture, major in agricultural economics, at Xavier University in Cagayan de Oro City. She has been the Consultant of Catholic Relief Services (CRS) in its agroenterprise projects in the Philippines since 2005. She assists CRS development partners that include the government, NGOs, faith based organizations, academia, corporate foundations, and the business sector in projects that organize farmers for business, build value chains for their products, and link them to markets. She has considerable experience working with farmers at the grassroots as Executive Director of Kaanib Foundation in Bukidnon for 10 years. She then taught agricultural marketing at the Xavier University College of Agriculture for three years during which time she also established and coordinated a student marketing program for students’ practicum learning in business, and participated in researches of its Institute of Market Analysis. After her work in the university, she devoted five years to develop her family farm specializing in vegetables. She cultivated business networks in her position as Vice President for Marketing of an industry association (NorminVeggies) she is affiliated with as a vegetable producer. She is instrumental in developing the agroenterprise clustering approach in CRS, bringing together the richness of experience in her involvements in the NGO, cooperative, academic, vegetable industry association, and the business world of buyers and agricultural service providers, and also her own direct experiences in her own farming, in contributing to development ideas and approaches in linking farmers to markets.
The sharp increases in international food prices in 2007–2008 raised serious concern among ASEAN member states about its impact on food security in the ASEAN region. The ASEAN Ministers of Agriculture and Forestry (AMAF) recognized the importance of regional cooperation in addressing the problem, especially by strengthening existing ASEAN initiatives and measures. In this regard, ASEAN developed the ASEAN Integrated Food Security (AIFS) Framework to ensure long-term food security in ASEAN and improve the livelihoods of ASEAN farmers. The AIFS comprised four components—food security and emergency/shortage relief, sustainable food trade development, an integrated food security information system, and agricultural innovation—which are distinctive but interrelated in nature to facilitate cooperation in addressing food security in the ASEAN region. The AIFS Framework’s components were supported by six corresponding strategic thrusts. The AIFS was further elaborated into a Strategic Plan of Action on Food Security in the ASEAN Region (SPA-FS) for 2009–2013. The plan identified action programs, activities, responsible agencies, and a work schedule. As a basis for elaboration of future projects, it also identified initial sub-activities. As 2013 drew to a close, the Special Senior Officials Meeting-34th AMAF Meeting agreed that the AIFS Framework would be continued in 2014.

In addressing long-term food security in the ASEAN region, a new AIFS Framework was developed to provide scope and joint pragmatic approaches for cooperation among member states. The new AIFS Framework maintained the original four components and added “nutrition-enhancing agricultural development” as the fifth component supported by SPA-FS for 2015–2020.

The priority commodities for food security in the ASEAN region include rice, maize, soybean, sugar, and cassava. Other commodities such as livestock, fish, and crops for staple food, which are important for food security and nutrition, shall be identified during the course of implementation of the AIFS Framework and the SPA-FS for 2015–2020.

The new AIFS Framework and the SPA-FS 2015–2020 were endorsed by the Preparatory Senior Officials Meeting-AMAF and the 36th AMAF Meeting in September 2014 and proposed for final approval at the ASEAN Summit in October 2014 in Myanmar.
Agri-food Industry Investments to Promote Food Security

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By 2050, the world needs at least 60 percent more food above the the current level. One of the key drivers of such growth needs to be improving the productivity of crops, which trails the global population growth rate. Food security must be augmented with adoption of innovative technologies primarily at farm level. However, these technologies, including advanced plant breeding, usually take at least 10–15 years to get commercialized after going through stringent and extensive testing and regulatory approval. Hence, owing to the long gestational period, the world needs to plan today and invest in innovative technologies with futuristic perspective to holistically address widespread hunger and malnutrition, particularly in Asia. It is necessary to promote investments in technologies that can boost productivity, and provide the crops resistance against biotic and abiotic stresses and pre and post-harvest losses to name a few. Public, private, or joint investments in R&D in agriculture must be encouraged under a suitable policy environment that fosters a level playing field and appropriate safeguards for the returns and providing benefits to everyone in the agricultural food value chain.

Globally, agricultural investment is proven to have demonstrable effects in reducing poverty and hunger, and promoting environmental sustainability. The share of foreign direct investment inflows to the animal-agriculture sector needs to increase from the current negligible levels particularly to make a long-lasting impact particularly on the livelihoods of the billions of people who live below the USD 1.25 a day threshold. Innovative technologies including those in crop protection and plant biotechnology are necessary to address the increased food demand mainly from Asia and Africa. Apart from production-oriented technologies, investments must be encouraged in transfer of technologies, education, extension, and capacity building for the multiple stakeholders involved in agriculture, services (agronomic and marketing), and processing and value addition for food. It is imperative to ensure a science-based regulatory approach, considering the current and future potential impacts of advanced technologies that maximize benefits for not only the farmers but all participants in the food value chain.

Siang Hee Tan is currently Executive Director of CropLife Asia, the Asian operation of an international trade association with a presence in 91 countries. At CropLife Asia, he is responsible for directing regulatory, crop protection, biotechnology and outreach programs in 15 Asian countries. Other professional experience includes set-up the Universiti Putra Malaysia’s (UPM) Genome Centre, and management of two start-up ventures developing Bioinformatics Software and Pre-natal Genetic Testing. Additionally, at Sime Darby he was responsible for: setting-up the biotechnology Section for the Sime Darby Technology Centre (genetic testing for leukemia and pre-post bone marrow transplant monitoring for the Subang Jaya Medical Centre); for managing the Northern Corridor Economic Region Project (NCER) on large scale farming; and for developing an agri-entrepreneur program. Dr. Tan holds a BSc in Plant Pathology from the Universiti Pertanian Malaysia, an MSc in Genetic Engineering from UPM and a PhD in Molecular Biology (Plant Virus) from Okayama University, Japan. Professional recognition includes a Silver Award at the 2005 Geneva International Exhibitions and Inventions of New Techniques and Products, a US Government Cochran Fellowship for biological research at Case Western Reserve University in Ohio, and UPM awards for research and development.
Toward Food Security in ASEAN through Sustainable Agri-food Systems

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Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The sharp increase in international food prices in 2007–2008 had raised concerns on possible socio-economic impacts, particularly in the ASEAN region. At the 14th ASEAN Summit in Thailand in 2009, ASEAN leaders reaffirmed their commitment to embrace food security as a matter of permanent and high priority policy and adopted the ASEAN Integrated Food Security (AIFS) Framework (2009–2013) and its Strategic Plan of Action on Food Security (SPA-FS) to ensure long-term food security and to improve the livelihoods of farmers in the ASEAN region. The second phase of the AIFS Framework and SPA-FS (2015–2020), which were endorsed by the ASEAN Ministers on Agriculture and Forestry (AMAF) in September 2014 in Myanmar, integrated new areas of cooperation on food security and nutrition aspects into agricultural and food production systems and increased investment in agriculture.

As foundation, food security should have sustainable agrifood systems to promote means of livelihood, competitiveness, and stable supply of food. Sustainable agrifood systems need to be profitable for its actors along the value chain including farmers, processors, traders, and inputs suppliers, to enable them to provide safe, healthy, and affordable food for an increasing (urban) population. They also need to make efficient use of natural resources (soil and water) in sensitive ecosystems. The sustainability (in its social, economic, and environmental dimensions) of agrifood systems in ASEAN will be the key for the long-term productivity and competitiveness of more complex domestic and regional markets.

Sustainable agrifood systems in ASEAN need to explore, develop, and promote best practices to achieve sustainable agriculture. In addition, they need to optimize production inputs and farming practices that integrate climate resilience as well as reduce of pesticide use to produce safe food products.

Noting that sustainable agrifood systems require supporting research and development as well as capacity development and knowledge exchange to promote linkage with regional policy on food security and national policy and strategies, sustainable agrifood systems, nonetheless, are regarded as the sustainable approach toward long-term food security in the ASEAN region.

Pouchamarn Wongsanga is currently working as Senior Regional Coordinator of the ASEAN Sustainable Agrifood Systems Project, implemented by GIZ in collaboration with ASEAN, and based in Bangkok, Thailand. She is responsible for overall project coordination and facilitation, and ASEAN policy and cooperation, emphasizing the ASEAN Integrated Food Security (AIFS) Framework. Over the past 30 years, she has been working with regional inter-governmental organizations focusing on food/agriculture/forestry/natural resources policy and development, and facilitation of regional cooperation and partnership. She has actively engaged in and contributed to policy dialogues, global/regional cooperation, and partnership on issues in the food, agriculture (including fisheries), forestry, and natural resources sectors as well as crosscutting issues such as food security and climate change. She had worked in the ASEAN Secretariat and has substantially enriched and broadened her knowledge of and experience in ASEAN Community building and processes, diplomatic practices and protocols, servicing meetings and negotiation among ASEAN Member States and Dialogue Partners, cooperating with development partners and donor agencies, and engaging private sectors and civil society organizations.
PARALLEL SESSION B
THEME 1 - Productivity Improvement

SESSION 1B | Aquatic Agricultural Systems
Convened by WorldFish
Moderated by Dr. Lily Ann Lando | Country Communication Officer, WorldFish Philippines

WorldFish
WorldFish is an international, nonprofit research organization that harnesses the potential of fisheries and aquaculture to reduce hunger and poverty. In the developing world, more than one billion poor people obtain most of their animal protein from fish and 250 million depend on fishing and aquaculture for their livelihoods. Utilizing its scientific expertise, its networks and partnerships, and an innovative ‘research in development’ approach, WorldFish increases the productivity and sustainability of fisheries and aquaculture and improves the lives of poor people who rely on them. WorldFish is a member of CGIAR, a global agriculture research partnership for a food secure future.

Mission: To reduce poverty and hunger by improving fisheries and aquaculture.

Vision: To be the research partner of choice for delivering fisheries and aquaculture solutions in developing countries.

www.worldfishcenter.org
Aquatic agricultural systems (AAS) are farming and fishing systems where natural freshwater and/or coastal ecosystems supply the household livelihood, including income and food security. In the Philippines, these systems abound along freshwater floodplains and coastal waters. Here, families grow a range of crops; raise livestock; farm or catch fish; and harvest fruits, timber, reeds, and wildlife.

Recognizing the importance of aquatic agricultural systems and their potential to reduce poverty, CGIAR developed a new CGIAR Research Program on aquatic agricultural systems (CRP AAS). Led by WorldFish, the program aims to improve the lives of poor and vulnerable users of aquatic agricultural systems by 2016.

We concentrate our efforts initially on the VisMin Hub consisting of several provinces around the Bohol Sea from Regions 7, 8, 9, and 10 (Central Visayas - Pinambo in Bohol and Mancilang in Cebu; Eastern Visayas - Mahayahay and Maac in Southern Leyte; Zamboanga Peninsula - Galas in Zamboanga del Norte; Northern Mindanao - Waterfall and Binitinan in Misamis Oriental).

We anchor the AAS research program in the Philippines on our Strategic Framework that we symbolize with a bahay kubo (traditional Philippine nipa hut). The silong and floors represent the components of the AAS Approach, and community engagement, respectively. The walls represent the three research initiatives in the VisMin Hub. Through the AAS approach and engagement with the community, we will conduct research in development (RinD) focusing on the initiatives of productivity, markets, and governance. In so doing, we seek to answer these overarching research questions:

1. What agricultural research and development technologies deliver significant positive change in aquatic agricultural systems, particularly in the interests of the poor and marginalized?
2. How, and in what situations, does the AAS RinD approach foster enduring and equitable change in livelihoods of the poor and marginalized in aquatic agricultural systems—and how are these changes different from those produced by other approaches?
3. Do the AAS scaling pathways lead to impact at scale, and how can the program most effectively harness learning to support scaling?

Working thus with our partners and the community, we will establish research activities in our sites that are deeply embedded within the development work that we facilitate or that is being led by our partners. And thus, bring about the roof of our bahay kubo—enhanced resilience, improved well-being, and inclusive growth for the communities dependent on aquatic agricultural systems in the country.

Maripaz L. Perez is the Regional Director for Asia and Country Manager for the Philippines of WorldFish. She has a post-doctorate in Research Priority Setting earned from the Virginia Polytechnic Institute and State University in 1990. She graduated from the University of the Philippines in Los Baños, Laguna, Philippines in 1977 with a BSc in Agriculture, majoring in Agricultural Economics. She completed her graduate education in the same university, finishing her masters in Agricultural Marketing in 1985 and her doctorate on Agricultural Economics in 1988. She has parlayed this educational preparation into a career spanning 35 years both in Philippine government service and since 2006, in WorldFish. Prior to joining WorldFish, Dr. Perez led the Small Enterprise Technology Upgrading Program (SET-UP) as Undersecretary for Regional Operations of the Department of Science and Technology (DOST). As the first Country Manager for the WorldFish Philippine Country Office (PCO), she has built the team from an original staff complement of five, to what it is now at 33. Under her leadership, the team completed the USAID-funded project “From Reef to Ridge: An Ecosystem Based Approach to Biodiversity Conservation and Development in the Philippines” and the “Climate Change Impacts, Vulnerability Assessment, Economic and Policy Analysis of Adaptation Strategies in Selected Coastal Areas in Indonesia, Philippines, and Vietnam,” among others. Currently, she leads the PCO research team in the implementation of the CGIAR Research Program on Aquatic Agricultural Systems (CRP AAS) that covers seven pilot communities in the VisMin Hub.
A Rising Tide Does Not Lift All Boats: Transformative Approaches for Strengthening Resilience and Equity in Aquatic Agri-food Systems

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Rapid strides have been made in reducing poverty and hunger in Southeast Asia in the last few years, facilitated by economic growth which was slightly higher than average for the emerging economies. However, about one-third of the population still lives under USD 2/day. Hidden hunger, which is a chronic lack of micro-nutrients that can seriously hinder economic development, is pervasive and hot spots were found to be severe in several countries in Southeast Asia (Muthayya et al. 2013). The challenge of managing the limited natural resources to enhance food security, in the light of climate change and rising demand for food due to population pressure, is becoming complex by the day. Aquatic agricultural systems, which include major wetlands, floodplains and deltas, and most coastal systems, are important for food and nutrition security in Southeast Asia. Despite their high potential, poverty is also high.

In many of the fast-growing economies, inequalities related to both income and opportunities are also rising in contrast to the past record of growth with equity in the 1960s and 1970s (IMF 2013). Pockets of extreme and moderate poverty persist at higher levels of average per capital income. Economic growth is necessary, but not a sufficient condition for equality. Inequalities pose a threat to long-term economic growth and can constrain future and more widespread poverty reduction. They adversely affect incentives, motivation, productivity, human capital, and social cohesion (Yap 2014).

A specific form of inequality that needs attention is between genders. A large proportion of the poor and vulnerable are women and girls in Southeast Asia and also globally. They are 60 percent of the undernourished globally. They play a very critical role in aquatic agri-food systems, but operate way below their potential due to their limited access to productive resources, technologies, and markets. Projects and programs have made efforts to ‘integrate’ or ‘mainstream’ gender into agricultural research and development practice to close these ‘gender gaps’. However, the disparities persist.

This paper makes the case for a shift in the way gender issues are addressed in agricultural research and development policy and practice, so that the efforts result in transformational change that is profound, enduring, and irreversible to have deep and lasting impact. Taking a multi-dimensional view of poverty, the paper argues for a multi-pronged, cross-sectoral approach which addresses both the causes and consequences of gender inequalities. It also highlights the radical breakthroughs in paradigms, beliefs, and behavior at various levels that this shift demands.

Ranjitha Puskur received her MSc and PhD in Agricultural Economics from the Indian Agricultural Research Institute, earning the gold medal for outstanding academic performance for the former, and the Jawaharlal Nehru prize for outstanding PhD research in Agricultural Economics. She obtained a Diploma in Agricultural Research for Development from the International Centre for Development Oriented Research in Agriculture (ICRA), The Netherlands. Under a research scholarship, she studied the Economics and Policy of Technical Change at the United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT), The Netherlands. She has been part of the CGIAR since 2002, beginning as a scientist at the International Water Management Institute (IWMI), then moving to the International Livestock Research Institute (ILRI) in 2005. In 2012, Dr. Puskur transferred to WorldFish to lead its gender research program, building a high quality team and leading the development of the Gender Strategy for the CGIAR Research Program on AAS, which is widely cited as one of the best in CGIAR. Now, Dr. Puskur is the Senior Policy Advisor for the CGIAR Research Program on Aquatic Agriculture Systems at WorldFish.
Asia dominates global demand for seafood, and growing wealth and populations are expected to drive even greater future demand. Combined with pressures on ecosystems supplying traditional sources of fish—the oceans and inland waters—this demand is driving growth of farming or aquaculture, as an alternative source of fish for food, nutrition, and income. For global fish (finfish and shellfish) availability to meet projected demand, aquaculture production may need to more than double by midcentury, rising from 67 million tons in 2012 to roughly 140 metric tons in 2050. This level of aquaculture growth could supply 14 percent of the additional animal-source food needed by 2050, employ millions more people than today, and generate billions of dollars in additional income.

Aquaculture can be an ecologically efficient means of producing animal products, as the scale of ecological impacts from some aquaculture systems is comparatively less than other animal food production methods. Future growth, as for all food production systems, will need to be with reduced ecological impacts and with more efficient use of natural resources. Thus, a more sustainable intensification is required.

This presentation presents some production scenarios and ecological analysis data derived from a recent global analysis of the aquaculture sector to highlight improvements that are needed for aquaculture farming systems to supply the aquatic products required for future food security, but without increasing its ecological impacts. Lessons learned from recent aquaculture improvement projects in Asia are discussed, providing key lessons in policies, practices, and investments for sustainable growth of aquaculture in Asia, and improved contributions to the region’s future food and nutrition security. Future growth of aquaculture will require significant investment; the need for renewed attention to investment in the growth of small and medium aquaculture enterprises—the majority of Asian aquaculture producers—is emphasized.

Michael J. Phillips received a PhD in Aquaculture and Fish Behavior in 1982 from the University of Stirling, UK, and has been involved in research and development on various aspects of Asian aquaculture and aquatic systems since 1985, with occasional short periods of work in the Americas, Africa, and the Pacific. Before joining WorldFish in 2009, Dr. Phillips was Research and Development Manager at the Intergovernmental Network of Aquaculture Centres in Asia-Pacific (NACA) in Bangkok, Thailand. Since joining WorldFish, he has been involved in sustainable aquaculture research in Bangladesh, Cambodia, Indonesia, the Philippines, and the Solomon Islands, and more recently, in Egypt and Zambia. He recently contributed to two seminal publications: the landmark “Blue Frontiers” study on the global ecological footprint of aquaculture, conducted in partnership with Conservation International and a publication on aquaculture in 2050, with the World Resources Institute. With WorldFish colleagues and private partners, he researches on business innovations and financing for investment into SME aquaculture enterprises. He is currently the director of the Aquaculture and Genetic Improvement Division of WorldFish, the leader of the sustainable productivity theme of the CGIAR Research Program on Aquatic Agricultural Systems, and a co-lead on the feeds and forages theme in Livestock and Fish, another CGIAR Research program.
Nestlé Philippines, Inc.

Over a hundred years after it first started operations in the country, Nestlé Philippines, Inc. today is a robust and stable organization, proud of its role in bringing the best food and beverage throughout the stages of the Filipino consumers’ lives. The Company employs 3,700 men and women all over the country, and is among the Philippines’ top corporations. Its products are No. 1 or strong No. 2 brands in their respective categories.

Driven by its mission to nurture generations of Filipino families, Nestlé today produces and markets products under some of the country’s well known brands such as NESCAFE, NIDO, MILO, NESTEA, MAGGI, BEAR BRAND, NESTLÉ, and PURINA, among others. Its product range has expanded to include coffee, milk, beverages, non-dairy creamer, food, infant nutrition, ice cream and chilled dairy, breakfast cereals, confectionery, and pet-care.

www.nestle.com.ph
Winning with A Value Chain Approach in Coffee

Coffee is the world's most popular beverage, next to water. The demand for coffee (both locally and globally) has been increasing year-on-year. Nine out of 10 Filipino households consume coffee on a regular basis. Currently, the demand for green coffee is estimated at 70,000 metric tons. With the continuous demand for coffee, the available supply for green coffee beans—the raw material used for all kinds of coffees consumed—is threatened. In the early 1990's, the Philippines, a coffee producing country, was a net exporter of green coffee. Twenty years later, however, its local production is only able to yield a third of the requirement, forcing coffee manufacturers such as Nestlé to import most of their requirements from other coffee-producing countries such as Vietnam and Indonesia.

As the leading buyer of green coffee and manufacturer of instant coffee in the country, Nestlé is keen on working with key partners and farmers to boost local green coffee supply and to develop the coffee industry as a whole. Embedded in the company's core strategies is creating shared value (CSV) which espouses the belief that for Nestlé to be truly successful in the long-term and create value for its shareholders, it must also create value for society. CSV allows Nestlé to creatively craft strategies that not only make a profit for the business, but also create a meaningful and lasting social impact as well. It entails a constant lookout for opportunities in the value chain where Nestlé can create shared value—from agriculture and sourcing, through the manufacturing and the distribution of its products, all the way to communication with consumers.

One of Nestlé's biggest CSV platforms is the NESCAFÉ Plan, a program aimed at rural development through coffee. It has three core pillars: responsible agriculture, responsible production, and responsible consumption. With the focus on responsible agriculture, Nestlé hopes to make coffee farming a more profitable and sustainable livelihood for many coffee-dependent communities.

In the Philippines, the strategy of the NESCAFÉ Plan is hinged on the ambition of helping the Philippines achieve self-sufficiency in coffee while ensuring that by 2020, about 75 percent of NESCAFÉ’s green coffee requirements will be coming from the domestic market. This will enable the company to mitigate the risk of supply shortage from import markets and to extract more coffee from local green coffee, which is seen to be more superior in quality.

Locally, the plan currently has two programs. The Agronomy Program hopes to help coffee farmers improve their income through increased quantity and quality of yield with the best available technologies and techniques and a lower environmental impact while also guaranteeing the long-term supply of quality coffee in the Philippines. Nestlé has centers that make available high-yielding planting materials at cost, function as a techno-demo farm, house robusta plantlet production nurseries, operate as a local R&D center for new coffee selections, house a composting facility for organic fertilizer, and operate as satellite buying stations. A team of expert agronomists deployed to various coffee-growing areas all over the country implement this program. Farmer Connect, on the other hand, is a direct buying program which allows small-scale farmers to sell their produce at a price aligned with the world market price by selling directly to Nestlé through its satellite buying stations located in strategic coffee-growing areas across the country. Through this platform, farmers are also able to benefit more quickly from their produce since they get paid within eight banking hours upon the sale of their green coffee beans.

Nestlé also supports Responsible Sourcing by encouraging farmers and trade partners to engage in sustainable farming practices via the Common Code for the Coffee Community (4C). Farmers and trade partners who get verified under 4C get an additional PHP 1.50 premium on top of the Nestlé green coffee price for every kilo of green coffee sold.

All these efforts are geared toward helping the farmer improve his income as much as five times more than average.
While these programs are geared toward improving farmer income, Nestlé recognizes that reviving the coffee industry is a gargantuan task that requires the support, not only of Nestlé, but of other key stakeholders who can help bridge the gaps in the value chain.

In March and November 2011, Nestlé signed a Memorandum of Agreement (MOA) with the National Convergence Initiative (NCI), a cross collaboration of various agencies of government which supports the Inclusive Growth and the National Greening Program (NGP) agenda. The MOA seals the agencies’ commitment in providing appropriation funds for coffee plantlets, nurseries, training, and fertilization. To date, Nestlé has programs in partnership with the following: the Department of Agriculture (DA) in the Small-farmer Program, the Philippine Coconut Authority in the COCOBED Project, the Department of Environment and Natural Resources in the NGP and the Department of National Defense in the AFP-Modernization Program.

In July 2013, the DA collaborated with Nestlé and other industry stakeholders to come up with a coffee roadmap to further strengthen the government’s involvement in the coffee sector and to agree on key focus areas for the industry namely increasing planted hectarage and productivity per hectare.

Nestlé also engages itself with local governments to jumpstart coffee development programs in key potential areas. The company is participating in the Q-LiFE (Quirino Livelihood for Everyone) Upland Ecosystem Program, a private-public partnership (PPP) program by the province of Quirino, which aims to regenerate the Dumata watershed while ensuring long-term livelihood for the residents of the 13 barangays within them. In 2013, Nestlé Philippines, Inc. also signed a MOA with the Kahayagan Coffee Growers Multi-Purpose Cooperative and the municipal government of Tagbina, Surigao del Sur to formally launch Project CoFFEE (Coffee Technologies and Funds to Fuel Economic Empowerment), another comprehensive public-private partnership, which aims to address the challenges facing smallholder coffee farmers in Mindanao.

Nestlé has an existing partnership with Pur Project, a Paris-based organization, on agroforestry initiatives in Visayas and Mindanao.

Ruth P. Novales, Vice President and Corporate Affairs Executive of Nestlé Philippines is a graduate of the Ateneo de Manila University. Ruth first embarked on a career in marketing agriculture for Jardine Davies and eventually became its public relations head. At the same time, she took her Masters of Business Administration at her alma mater and studied agricultural extension and communications at the the University of Reading, England. Thereafter, she took on key sales roles in several companies which included Wyeth and Kimberly Clark. In 2006, she joined Nestlé Philippines as regional sales manager for its Ice Cream Street Selling Division. Soon after, she took on the role as Head of Marketing Promotions and Events and was promoted to Vice President. In 2012, Ruth joined the NESCAFÉ Plan as Corporate Affairs Executive where she proved to be highly instrumental, not only in driving the interest in coffee in the farming community, but also in establishing unique and key partnerships with the National Convergence Initiative and a number of local government units. It is through her efforts that the coffee industry is now given an annual budget appropriation for plantlets and fertilization in coffee regions throughout the country. Ruth is married and is a mother to three children.

Maria Odessa Lañas-Eustaquio is Assistant Vice President and Consumer Marketing Manager of Nescafe Plan, Nestlé Philippines Inc., Odessa began her career in Nestlé as a sales and marketing management trainee in 2002, two years after graduating from college. After moving up from the program in 2004, she was assigned to brand management handling the brands Carnation and Nestlé Cream. In 2007, Odessa was transferred to the Coffee Business Unit handling various brands and brand initiatives for NESCAFÉ. Her career took on a unique turn when she got appointed as the lead for the NESCAFÉ Plan, Nestlé’s Global Creating Shared Value Program in Coffee in 2010. Together with Art and Ruth, she has played the critical role of engaging corporate Nestlé to the plan and of gathering the necessary support for its establishment, growth, and sustainability. Today, the Philippine NESCAFÉ Plan has become one of the best practices within the Nestlé World and has been widely recognized in the industry as one of the best examples of inclusive business. Odessa is a graduate of the Ateneo De Manila University with a BSc in Management of Communications Technology. She is married and is a mom to a toddler named Matteo.

Jose F. Reaño started his career in Nestle in 1990 as Research and Development Coordinator on varietal improvement, nutrition, propagation, and integrated pest management studies on coffee, cacao, and soybeans. He is one of the research scientists responsible for accelerated propagation of desirable Robusta coffee selections through somatic embryogenesis in collaboration with Nestle R&D Center in Tours, France. For almost a decade, he spearheaded local evaluation, development, and registration of high-yielding Robusta coffee selections currently accredited, labeled, and certified by the National Seed Industry Council (NSIC) for commercial planting in the Philippines. Simultaneously, he has been involved in grassroots technology transfer and extension activities advocating and promoting sustainable farming systems. He is a recipient of various awards in recognition for his invaluable service as researcher and extension worker. Dr. Jose F. Reaño finished his BS Agriculture (1978), Master in Agriculture (1981), and PhD in Botany-Plant Physiology (1989) in UP Los Banos. He conducted his dissertation and post-doctoral fellowship in Ben-Gurion University in Israel. Before joining Nestle, he served the Philippine government for 13 years as Research Specialist on stress physiology and sustainable farming systems of various plants.
World Agroforestry Center (ICRAF) Philippines

ICRAF Philippines has been operating in the country for 20 years. It is conducting research and development on evolving issues surrounding natural resources management including upland farming technology, forest-community organization, climate change, and policy formulation. With strong collaboration and support from various local, national, and international organizations, it is a leader in natural resources management research not just in the country but also in Southeast Asia.

Its key contributions include having pioneered Landcare research in ICRAF and continuing to spearhead new learning in community-based natural resource management, having developed innovative agroforestry systems and practices such as the use of natural vegetative strips and vegetable agroforestry systems, being one of the leaders in climate change research in the country, and working closely with national partners including policy makers especially in natural resources management and climate change. It was instrumental in two landmark events: holding the National Conference on Climate Change Adaptation and the enactment of the Climate Change Act of 2009.

www.worldagroforestry.org
‘Perennialisation’ of Upland Agriculture

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With continued increases in demand for food, cultivation of annual crops like maize is spreading to upland areas and increasingly marginal land, leading to soil erosion and environmental degradation. The World Agroforestry Centre is advocating a ‘Perennialisation of Agriculture’ in which trees are integrated into farming systems and, where possible, annual crops are also substituted for perennials and trees. This has the advantage of providing continuous ground cover and deep root systems for soil protection and stabilization, while increasing carbon stocks and reducing nutrients lost by leaching.

The presentation highlights key environmental issues with annuals and how perennials and trees can be part of the solution in upland areas of the Philippines and other Southeast Asian countries. From perennial grains to tree staple crops and multi-functional trees, examples from the World Agroforestry Centre’s own test site in Mindanao are presented, along with innovations from around the world that could help to change the way food, feed, and fuel are produced on upland farms in the future.

In addition to highlighting the benefits of this approach, remaining knowledge gaps and challenges will be outlined, along with outstanding research required to accelerate uptake.

Craig B. Jamieson is a biomass consultant at the World Agroforestry Centre, based in Los Baños, Philippines. He has a MSc in International Rural Development from the Royal Agricultural College, UK, and specializes in integrated food-energy systems.
Degraded sloping landscapes are expanding rapidly in the Philippines due to severe soil erosion attributed to intense rainfall associated with frequent typhoons because of changing climate. Agricultural productivity is decreased, which in turn heightens food insecurity and exacerbates poverty particularly on the sloping acid uplands where soils are inherently poor and farmers have limited cash flows for agricultural production. Through conservation agriculture with trees (CAT), the principles and practices of minimal soil disturbance, continuous mulching, integrated pests and nutrients management, diverse species rotations, and deliberate integration of trees; integrated water management through rainwater harvesting; and Landcare approach constitute the best ‘tool box’ for sustainable crop production intensification (SCPI) in the Philippine uplands. Researcher-managed and farmer-managed conservation agriculture production systems with trees (CAPS) were evaluated across the landscape of Claveria, Philippines. We found that cassava (*Manihot esculenta*) + stylo (*Stylosanthes guianensis*) yielded the highest biomass and total sale. Interplanting maize either with cowpea or ricebean may not give better total grain and biomass yields, but provided higher sales due to relatively better price of beans. Interplanting of maize with cowpea and relayed with upland rice ensured food and nutritional security to smallholders by shortening harvest periods as well as increasing harvest cycles. We also found that *Arachis pintoi* grown with maize provided better ground cover protecting soil against erosion as well as feed for livestock. We found that the most limiting nutrients were nitrogen (N) > phosphorus (P) > Potassium (K). Omitting N application reduced maize yield by 67 percent, P by 59 percent, and 21 percent without K application. Optimum rate of NPK application for maize was 120-20-0, but maintenance K of 17 kg/ha was necessary. Promising varieties of maize, upland rice, cowpea, forage grasses, forage legumes, sweet potato, cassava, sorghum including “adlai” (Job’s tears) were identified out-yielding locally grown varieties in economic and biomass yield which are suitable for CAPS. We also found that a cost effective way of creating rainwater harvesting system through animal built embankment (ABE). A series of ponds can mitigate severe run–off during heavy rainfall events by increasing water infiltration, thus, mitigating flooding. Rainwater harvesting ponds provided an opportunity for farmers to grow fish, ducks, and other aquatic animals which enhanced household food and nutritional security while pond water enriched with nutrients can be used to irrigate trees and crops during dry spells. Our research results are extrapolated to other upland areas in the Philippines through the Landcare approach. Through the active participation farmer groups, local government units, and technical facilitators, we achieved rapid and inexpensive scaling up technologies in the Philippine uplands and perhaps we will achieve similar success in other areas in Southeast Asia with similar bio–physical and socio–economic environments.

Agustin R. Mercado, Jr., has extensive experience on conservation farming, agroforestry, and forestry research and development projects with the World Agroforestry Centre working directly with rural communities, and has extensively published related to upland issues. He has been involved in numerous upland projects supported by international research and development organizations in collaboration with both government and non-government organizations and people’s organizations in the Philippines. He is the concurrent Research Manager for ICRAF Mindanao, Philippines. Dr. Mercado completed his PhD in Agricultural Sciences (specialized in agroforestry, nutrient cycling, use of stable isotopes (15N & 13C) at the University of Hohenheim.
Strengthening Climate Change Resilience of Upland Agriculture: The Contribution of GIZ in the Philippines

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Due to the inherently low soil fertility of most upland soils, upland farmers growing corn and upland rice for home consumption frequently fail to meet their household requirements and have to sell other crops to buy their staple diets. The cash crop of choice is often sugar cane, but the widespread growing of sugar cane and corn in the uplands without soil conservation measures is a major cause of land degradation. The soil erosion and degradation, unbalanced water supply and resulting poverty are even aggravated by the effects of climate change.

Commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the German Federal Ministry for the Environment, Nature Conservation, Building, and Nuclear Safety (BMUB), GIZ supports its Philippine partners to strengthen upland agriculture and agroforestry systems resilient to climate change. The technical approach focuses—as in many similar projects—on permanent crops, agroforestry elements such as fruit and forest trees, and soil conservation measures. Experience has shown, however, that it is not enough to just subsidize hedgerows and tree planting. Without an effective extension service, tangible economic benefits, secure land tenure, value adding, assured markets, and strong partnership with government agencies and the private sector, the upland farmers are rarely in a position to shift to sustainable agroforestry systems and improve climate resilience and farm income.

The GIZ approach focuses, therefore, on public private partnerships in the agroforestry sector, crops such as coffee, cacao, white copra, and abaca. Besides providing training, extension, and high-quality seedlings, the public–private partners also assure marketing and value adding for the participating farmers. As the basis for any investment in improved land use, GIZ is supporting the participatory land use planning and the issuance of land use rights by DENR.

An important element of climate change-resilient agroforestry systems are forest trees. Farmers are most willing to plant trees, if they are allowed to harvest, process, and sell them. GIZ supported plantation timber harvesting in two CBFMA (Community Based Forest Management Agreement) areas, to demonstrate environmentally-friendly harvesting systems, value adding and to show the benefits for the people’s organizations. These studies revealed, however, the dire need for more user-friendly resource use permits, the clarification of fees and taxes, and better marketing arrangements before the people’s organizations can really receive benefits and are motivated to plant forest trees.

The suggested approaches and lessons learned have been compiled in the knowledge products MOREFORESTs and Upland Agriculture in the Philippines.

Jürgen Schade has been working as forestry/agroforestry consultant in the Philippines for 16 years for GIZ. He holds a PhD in Forestry, with substantial working exposure to agroforestry, upland agriculture, and silvipasture. Dr. Schade has been the Chief Adviser for the Forest and Climate Protection (ForClim) Project Panay, the EnRD Community-based Forest Management Component, the Community-based Forest and Mangrove Management Project Panay and Negros, and the Integrated Rainforest Management Project in Quirino Province and Surigao del Sur. Outside the Philippines, he worked for upland development projects in China (strong horticulture and silvipasture components), Vietnam, and several African countries. All these projects included a substantial upland agriculture and agroforestry component with focus on appropriate technologies, agroforestry, silvipasture, extension, capacity building, participatory land use planning, tenure instruments, value adding and marketing. Privately he manages a small agroforestry plantation in Panay.
Asia BioBusiness Pte. Ltd. (ABB)

Asia BioBusiness Pte. Ltd. is a boutique consultancy based in Singapore, established in 2005 by Dr. Andrew Powell and Dr. Paul Teng.

Asia BioBusiness provides the strategy, management, communication, and training to make complex developmental and commercial initiatives a resounding success through East Asia, ANZ, and South America. It advances the bio-based agendas of governments, intergovernmental agencies, and the private sector. ABB has a proven track record of strategic project management, consulting, policy analysis, technology sourcing, and education and training. Leveraging our extensive networks on the ground, built up over decades in the region, ABB also offers highly specialized consulting services in risk communication, issue management, and strategic crisis communication.

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The U.S. government defines food security as having, at all times, both physical and economic access to sufficient food to meet dietary needs for a productive and healthy life. Food insecurity is often rooted in poverty and has long-term impacts on the ability of families, communities, and countries to develop. For example, prolonged undernourishment stunts growth, slows cognitive development, and increases susceptibility to illness. U.S. government and multilateral agencies are working in partnership with other countries, civil society, research institutions, and the private sector. This paper will examine the ways that the U.S. government is addressing food availability, economic access, physical access, and utilization—including through programs focused on food assistance, agricultural markets and trade, agricultural capacity development, and nutrition—and how the approach has changed over time.

Jack A. Bobo is the Senior Advisor for Biotechnology at the U.S. Department of State. Mr. Bobo works on trade policy, food security, climate change, and development issues related to agricultural science and technology, including agricultural biotechnology. Mr. Bobo is responsible for developing and implementing U.S. trade policy related to new agricultural technologies and working with foreign governments to address regulatory barriers to U.S. agricultural exports. He also works closely with officials from developing countries to support the development of biosafety legislation and facilitate technology transfer to increase agricultural productivity, improve food security, and respond to climate change through mitigation and adaptation. Prior to joining the State Department, Mr. Bobo practiced law at the Washington, D.C. firm of Crowell & Moring, LLP. His education includes a degree in law, a Master of Science in Environmental Science, as well as degrees in chemistry, biology, and psychology. Previously, Mr. Bobo received a research fellowship in international law at Cambridge University, England, served as an advisor to the President’s Information Technology Advisory Committee, and taught science in Mekambo, Gabon in Central Africa as a Peace Corps Volunteer. He lives in Potomac, Maryland with his wife, Dr. Qiao Bobo, daughter, and son.
Rice Bowl Index in Support of Food Security Governance

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There exists a fundamental disconnect in most of the discussion and debate on food security.

That we need to produce more food for a growing global population in an environmentally sustainable way is not in dispute. We know this. We have the tools and the know-how today.

But somehow, it just doesn’t get done. All of which begs the question: are we—the global community—even having the right discussion on agriculture? After years and even decades of talking, are we really moving the needle?

There is a belief that farming today is not conducted responsibly with a preference among middle class consumers for local, organic, and urban farming, but recognition that governments and large scale farming have the greatest potential to address the global challenge of food security.

In such an environment, what is the legitimate role of the private sector?

Through investment in agriculture, the private sector is able to drive seed improvements, responsible crop protection methods, and more efficient use of land and water in order to better incentivize farmers to grow crops more efficiently.

As part of the effective governance of food security issues, tools such as the Rice Bowl Index are helping to shape the discussions that must lead to collaborative action among key stakeholders. The Rice Bowl Index uses open data sources to assess how robust a country’s capacity is to address the challenges of food security. The unique feature of the Rice Bowl Index is that it captures the complexity of food security through a multi-dimensional approach and reduces this complexity into user-friendly charts and tables. These provide a platform for discussing potential action to address the challenges. The tool serves as a common language for different stakeholders to engage in purposeful dialogue leading to solutions-oriented action.

Andrew McConville has been Head of Corporate Affairs for Syngenta in the Asia Pacific since 2008. Based in Singapore, he is responsible for the management of the company’s reputation and stakeholder relationships across the region in government and public affairs, public policy and partnerships, media relations, internal communications, community relations, corporate responsibility and issues and crisis management. Andrew has 20 years of experience in agricultural issues management, public relations, and corporate affairs. He has worked in the private sector—both corporate and consulting—and also spent several years working in government, managing issues and stakeholders in the Asia Pacific region, the United States, Europe, and South America. Andrew holds a first class honors degree in Agricultural Economics from the University of New England and a Master of Science in Agricultural Policy from Oxford University.
An Analysis of Food Security Policy and Governance in APEC Economies

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This presentation will provide an overview of the governance of food security in Asia-Pacific Economic Cooperation (APEC) economies.

Asia BioBusiness conducted a food security policy analysis on behalf of the APEC Secretariat in 2012. This essentially was an analysis of the responses to the food security challenges that were seen during the crisis of 2008. It was clear that ensuring food security had become a political agenda item but the complexity of the challenge, namely the multidimensional nature of the problem, was largely unappreciated. Policy was often developed in isolation from other aspects of food security, leading to a disjointed and inefficient approach to the problem.

Governance was largely uncoordinated with potential for both overlap and conflict with other national efforts. In many economies, multiple agencies or departments were often involved in dealing with the diversity of issues related to food security, often resulting in disconnected policy making and miscommunication. Food security policies were also developed that were in conflict with other non-food-related agenda.

In addition to their commitments to food security initiatives within APEC, member economies were also taking part in other regional and global initiatives by bodies such as the G20, G8, ASEAN, the United Nation’s High Level Task Force on Food Security, the Committee on World Food Security, the World Economic Forum, and the CGIAR. There was, and still is, considerable potential for overlap.

Andrew D. Powell graduated from the University of Edinburgh with honors in Biology and obtained his PhD from the University of Calgary, Canada. He has held research and academic positions at the University of Guelph, Canada; the National Institute for Health Sciences in Tokyo and Tsukuba, Japan; and the National University of Singapore. He has worked as a consultant since 1995 assisting a wide range of clients from both the public and private sectors in their activities in biotechnology across East Asia, ANZ, and South America. He founded Asia BioBusiness with Professor Paul Teng in 2005. Dr. Powell also is an expert in risk communication and has provided training and advice to both public and private sector clients all around the Pacific Rim. He is on the Advisory Committee of The Scientific American/BioIndustry Organization Worldview Publication and the advisory board for Syngenta’s Rice Bowl Index.
Agricultural Policy and Institutional Reforms in Malaysia: Implications and Lessons

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Like other developing countries, Malaysia’s agriculture was challenged by the food and financial crises in 2008 and 2009 respectively. The 2008 crisis particularly revealed the country’s vulnerability to the vagaries of the world rice market. Similarly, the 2009 financial crisis challenged the sustainability of the country’s economy under a dynamic world. The two events have prompted Malaysia to embark on a transformation plan to ensure food security, resilience, and sustainability. A number of policies have been formulated: the National Food Security Policy (2008), Ninth and Tenth Malaysia Plans (2006–2010 and 2011–2015), National Agro-food Policy and National Commodity Policy (2011–2020) and two national key economic areas (agriculture and palm oil) under the broad Economic Transformation Plan (2011–2020) for the whole economy. This paper narrates the agricultural policy and institutional reforms in Malaysia and their implications to resilience, equity, and balanced growth.

These new policies face a daunting task in addressing the structural problems of Malaysian agriculture. The overemphasis on industrial commodities (palm oil, rubber, and cocoa) in the past has left the food sector lagging on all fronts. The country is dependent on imports for major food items (cereals, fruits, vegetables, food and beverages) and inputs (seeds, fertilizer, pesticides, feedstuff for livestock, agricultural machines, and laborers). Some strategic food items such as rice, requires heavy supports (subsidies and intervention) to ensure a certain level of self-sufficiency and, hence, security. The 2008 food crisis has merely intensified the interventions despite the prevalence of distortive market symptoms. The focus on industrial crops, which are largely run by the estates sector has left the smallholders received little attention and appreciation. The rapid development of the industrial sector is pulling away land, labor and capital out of the agricultural and rural sector, which results in labor shortages in plantation and rising wage rates. Unsustainable practices resulted in overexploitation of fisheries in the west coast of Peninsular Malaysia and poor quality of soil and water in the paddy farms as well as palm oil plantations. These evidences are lessons for the future which the new policies are expected to rectify and improve to ensure a sustainable and equitable growth of the Malaysian agriculture sector.

Fatimah Mohamed Arshad is professor of agricultural marketing at the Faculty of Economics and Management, Universiti Putra Malaysia (UPM), Malaysia. Currently she is the Director of the Institut Kajian Dasar Pertanian dan Makanan or Institute of Agricultural and Food Policy Studies, UPM. She has carried out research that focuses on issues on structural problems of the agricultural sector, food security, pricing issues, cooperatives, and evaluation of selected policies and strategies. She has received research grants from various sources, which include FAO, ICLARM, and ACIAR, as well as numerous grants from local public agencies. She believes that the future of agriculture lies in the smallholders as they contribute to the conservation of biodiversity and environment, diversification of output, preservation of family farms and the rural landscape, and creation of a large enterprising farming community that is dynamic and equitable.
This paper assesses the performance and structural changes of Thai agriculture in the last twenty years, identifies the problems and challenges in the Thai agricultural supply chain, and finally discusses some important policy reforms.

After a rapid decline in GDP share in the 1990s, agriculture had revived since the economic crisis, resulting in higher share in GDP, thanks to a surge in the world agricultural prices and currency depreciation. Except in 2012, the performance of agricultural export had been impressive, growing at almost 14 percent per annum. Thailand has been one of the world’s major exporters of several products. Given its export performance, declining share of food expenditure, and the fact that agricultural production grew much faster than population growth, food security is not a concern for Thailand. Overall poverty rate has declined sharply. However, poverty is still concentrated in households engaged in agriculture, particularly smallholders in areas with low soil fertility.

Agricultural development has been successful mainly because of the market oriented policies, particularly the prudential macro policy and outward oriented trade policy, which allow farmers and the private sector to readily adapt to changes in the world relative prices and external shocks.

Thai agriculture has experienced two major structural transformation. The first transformation is the rapid mechanization and gradual increase in farm size of rice, some field crops, and permanent trees. The major drivers are the shortage of labor and land abundance relative to the neighboring countries. The emergence of a large number of hired professional providers of machinery services has enabled smallholders to continue their production and keep labor cost under control. The second transformation is the shift toward higher value products and safe food exports, which has been possible by the export promotion policy, close cooperation between the public and private sectors, and role of agri-business.

Yet there are now some serious problems in the agricultural supply chain. Perhaps the most serious problems are the damage and huge fiscal cost of the paddy pledging (price support) policy, estimated at THB 939 billion, and domestic food safety problems.

Nipon Poapongsakorn is currently a distinguished fellow of the Thailand Development Research Institute Foundation (TDRI). He formerly held the position of President of TDRI from 2008 to 2013. Prior to that, he was Professor and Dean of the Faculty of Economics, Thammasat University. His fields of expertise include agricultural, livestock, and rural credit policies; rice market; labor economics and human resources; industrial, trade and investment policies; economic valuation and planning assessment; trade and competition policy; and agricultural trade negotiation issues. He is currently working on the issues of climate change and water management institution in the Chao Phraya River Basin and agricultural transformation in Thailand. He received a BA in economics from Thammasat University and PhD in economics from the University of Hawaii. He has also served as member of several national committees and foundations.

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Policies on agriculture and rural development during 2007–2013 have been reformed dramatically, reflecting the interest and efforts of the government in maintaining and improving agricultural production as well as reducing the negative impacts of the global crisis to take full advantages of international integration. Thanks to this, the agriculture sector has kept developing and its structure has changed positively with smaller proportion of traditional sub-sectors and bigger proportion of higher value added sub-sectors. Moreover, export turnover and trade balance of the agriculture sector have been growing significantly and there have also been positive changes in rural development in terms of infrastructure improvement and institutional reforms. However, the export of raw materials, low value added commodities, and weak competitiveness in the regional and world market are big challenges of the sector.

As the whole economy has begun its restructuring period with special focus on higher value added, efficiency and sustainability, the agriculture sector has outstanding competitiveness, thus it will be prioritized in order to have positive externality impacts on other economic sectors, thus bringing the whole economy into a new phase of sustainable development. Therefore, further policy reform is the precondition and driving force for the agriculture sector to adapt to challenges, especially in the context of the integration process speeding up, competition becoming more severe, and natural resources becoming more scarce.

The primer written by the research team of the Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD) gives an overview of the whole economy, particularly agriculture and the rural areas; provides updated information about the development process; and then highlights and gives an analysis of key issues, main policies which have been applied so far. Finally, it proposes some solutions for sustainable future growth.

Do Lien Huong obtained her Masters degree in Economics of Development from National Economics University, Hanoi, Vietnam, in collaboration with the Institute of Social Studies, The Hague, The Netherlands in 2006. She has gained rich experiences in data processing and policy analysis. She has actively participated in many projects in agriculture and rural development funded by INGO or the government of Vietnam.
Economic Research Institute for ASEAN and East Asia (ERIA)

ERIA works very closely with both the ASEAN Secretariat and 16 research institutes to undertake and disseminate policy research and provide analytical policy recommendations to leaders and ministers at their regional meetings. It aims to facilitate ASEAN Economic Community building and support ASEAN's role as the driver of the wider economic integration and sustainable growth in the region, contribute to narrowing of the development gaps and fostering research capabilities which can value-add to public policy-making, and nurture a greater sense of community in East Asia.

ERIA will intellectually contribute to the regional efforts for East Asian Economic Integration in wide-ranging policy areas from trade/investment to SMEs, human resource development, infrastructure, energy, and others. ERIA's main task will be to provide the policy analyses and recommendations to leaders/ministers in strong partnership with the ASEAN Secretariat and existing research institutes. Capacity building aimed at strengthening policy research capacities especially in the less developed countries is another important issue for ERIA.

www.eria.org
Enhancing Intra-ASEAN Agricultural Trade: Identifying Choke Points to Supply Chain Connectivity and Opportunities for Improvement

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The paper presents some results from an ERIA study on enhancing supply chain connectivity and competitiveness of ASEAN agricultural products: identifying chokepoints and opportunities for improvement.

ASEAN is a net exporting region in agricultural products (HS 1-24) globally. At the same time, there is marked variation in net trade positions among ASEAN member economies in the different agricultural products and in the different stages of the agricultural product value chain. This reflects to some extent the variation in land endowments relative to population and to the levels of development among ASEAN countries. The presentation starts with the evolution of intra-ASEAN trade in agricultural products focusing on the country specializations and important bilateral trade flows in major commodity groups according to key value chain segments. The discussion shows the growing specialization, interconnectedness, and apparent supply chain connectivity of ASEAN economies in agricultural trade.

Despite the growing interconnectedness, there remain substantial chokepoints to deeper supply chain connectivity in agricultural products in ASEAN. The ERIA study focused on two major chokepoint areas in the supply chain; specifically, (1) the regulatory regime and processes in the export and import clearance process; and (2) the adequacy, cost, and quality of infrastructure, transport, and logistics services as viewed by supply chain players. The paper suggests the differing degree of severity of chokepoints in the supply chain connectivity in agriculture products in the various ASEAN countries.

Addressing supply chain chokepoints offers opportunities for significant potential benefits. The ERIA study used gravity modeling to determine the possible impact of easing such supply chain chokepoints on intra-ASEAN trade. The results suggest substantial impact on the overall intra-ASEAN trade, total intra-ASEAN agricultural trade, and on intra-ASEAN trade in selected agricultural commodity groups. Gravity modeling results highlight that concerted reform efforts among the ASEAN countries lead to larger impact on intra-ASEAN trade, including agricultural trade. The ERIA study presents country-specific recommendations and important regional initiatives, albeit implemented nationally, to help address the supply chain chokepoints in ASEAN.

Ponciano S. Intal, Jr. is a Senior Economist at the Economic Research Institute for ASEAN and East Asia (ERIA) based in Jakarta, Indonesia. Dr. Intal has been the lead coordinator (together with his ERIA colleagues) of a number of major ERIA projects on ASEAN Economic Community over the past five years, including ASEAN Rising: ASEAN and AEC Beyond 2015; the Mid-Term Review of the Implementation of the AEC Blueprint; and the AEC Scorecard monitoring project. At present, he is the lead coordinator of the Framing the ASEAN Socio-Cultural Community (ASCC) Post-2015 and the Towards Responsive Regulations and Regulatory Coherence in ASEAN and East Asia: Deconstructing Effective and Efficient Regulatory Management Systems projects. Dr. Intal also led two important ERIA projects on agricultural trade and development in ASEAN.
Enhancing Supply Chain Connectivity and Competitiveness of Agriculture Products: Identifying Choke Points and Opportunities for Improvement in Vietnam

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This paper attempts to look into the extent and issues related to agricultural supply chain connectivity in Vietnam, focusing on two major groups of products: crustaceans and fish (HS03) and animal or vegetable oil and fat (HS15). These products are contributing more to Vietnam’s recent trade performance, particularly with ASEAN+3 partners. The common chokepoints in those chains include incomplete development of e-customs and a national single window, weaknesses in infrastructure system, inadequate connection among customs departments and between them and relevant government agencies, inconsistency in understanding and implementing related policies, and lack of quality in the cold chain. The value chain for HS03 as export products also suffers from specific chokepoints such as unmatched growth of domestic production, difficulty in tracing product origin, custom procedures, unharmonized requirements of importing countries, inconsistency of regulations, and presence of middlemen. HS15-specific chokepoints are shortage of testing facilities near major ports, overlapping mandates of government agencies, and no automatic import license. Several policy implications can also be drawn from those findings.

Vo Tri Thanh is currently the Vice-President of the Central Institute for Economic Management (CIEM). He holds a Masters and a PhD degree in Economics both from the Australian National University. Dr. Vo Tri Thanh mainly undertakes research and provides consultation on issues related to trade liberalization and international economic integration, and macroeconomic policies. His other areas of interests include institutional reforms, financial system, and economic development.
The International Rice Research Institute (IRRI)

The International Rice Research Institute (IRRI) is the world’s premiere research organization dedicated to reducing poverty and hunger through rice science; improving the welfare and health of rice farmers and consumers; and protecting the rice-growing environment for future generations. IRRI is a global, independent, nonprofit research and training institute supported by public and private donors.

IRRI breeds and introduces advanced rice varieties that yield more grain and better withstand pests, disease, as well as flooding, drought, and other negative effects of climate change. The institute develops new and improved methods and technologies that enable farmers to manage their farms profitably and sustainably. IRRI recommends rice varieties and agricultural practices suitable to particular farm conditions as well as consumer preferences. Finally, IRRI assists national agriculture and extension systems (NARES) to formulate and implement their respective national rice sector strategies and programs.

www.irri.org
Intensification of cropping systems, labor shortage, an aging farm population, and increasing demand for safer and better-quality food all lead to an increased need to mechanize rice farming and postharvest value chains. Small farm or field sizes, lack of appropriate machinery, weak research and support systems, and unsupportive policies are common hindrances to mechanization.

This presentation in its first section analyzes the history of agricultural mechanization in Japan, Korea, China, India, and Thailand and describes the frame conditions and factors that led to the success of mechanization during the various phases that the agricultural systems went through.

In the second section are discussed case studies on successful mechanization initiatives that the International Rice Research Institute (IRRI) was involved in, working with its national partners. The axial flow thresher, developed at IRRI in 1969 and now manufactured and used all over Asia, is the benchmark for other technologies. Stripper harvesters developed in the 1990s were less successful but are serving niche markets in Indonesia. Combine harvesters have become popular in many Asian countries. Laser leveling took off in India and is now being adopted in Cambodia and Vietnam. The study of the hydro tiller in Indonesia has been a source of useful insights on successful mechanization approaches.

In the last section, lessons learned from various mechanization programs are summarized, with special reference to factors that led to the successful uptake of mechanization options as well as to failed attempts. The paper concludes with recommendations for future initiatives.
Of all the natural resources water has become the most precious. Water must be thought of in terms of the chains of life it supports…
Rachel Carson (1961), The Silent Spring

In this paper we attempt to capture the experience, both positive and negative, in managing water resources over the past half century in Asia. Our objective is to emphasize the complexity of the problems.

We need far more resources to address these largely site-specific and inter-disciplinary problems—not hardware, but software and capacity building. Our procedure is to discuss briefly successes and failures in three different but overlapping time periods: 1960s to 1990s (the Green Revolution and surface irrigation), mid-1980s to the present (the groundwater revolution), and 2000 onward (the growing demand for water for non-agricultural purposes such as hydropower.)
The Center for Food and Agri Business, University of Asia and the Pacific

The Center for Food and Agribusiness (CFA) is the agri-food research and instruction arm of the University of Asia and the Pacific (UA&P). Starting 1983 as a research unit, today, it is a leading center for agri-food economics and agribusiness research in the Philippines.

The CFA conducts industry, policy, and strategic studies geared toward enhancing the agri-food sector’s competitiveness. The CFA establishes networks and strategic alliances with relevant institutions, both government and private. It has worked with various clients in the areas of agriculture, food and agri business, supply/value chain, benchmarking, policy analysis, industry analysis, demand/supply and forecasting, project analysis, and financial and economic analysis.

The CFA hosts two regular conferences a year—mid-year and year-end Food and Agribusiness Conferences—and offers specialized seminars and short courses. It publishes a monthly magazine, the Food and Agri Business Monitor, which is now on its 30th year. It has also published books pertaining to food and agribusiness.

www.cfa.uap.asia/home
The Indonesian Experience on Logistics Systems in the Supply Chain of Agricultural Products: Opportunities and Challenges

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Demand for agricultural products in many developing countries including Indonesia has changed dramatically over the last decades. Previously, consumers paid little attention to quality of agricultural products. As income per capita increases, however, consumers are more concerned with quality, food safety, and continuity in supply. To ensure consistent quality and quantity of agricultural products, a good logistics system is necessary. The system is one important activity in the supply chain of agricultural products connecting producers and consumer centers, and transferring raw materials.

A good logistics system can reduce risks and uncertainties in transferring input and output of the agriculture sector. This will reduce transaction costs and increase competitiveness of agricultural products. The lack of logistics systems leads to increased risks in the agricultural supply chain that can impact on the availability, delivery time, traceability, and quality of products. Logistics infrastructure, warehouses, distribution centers, cold chain, services, and institutional framework are important factors determining the performance of the agriculture logistics system.

In the traditional market channel, the logistics system in Indonesia is characterized by inadequate distribution centers and poor institutional and infrastructure support, cold chains, and packing houses. This situation is exacerbated by the lack of marine transportation logistics system. In fact, as an archipelagic country, Indonesia needs a good archipelagic logistics system. In contrast to the traditional market channels, modern market channels (e.g., food processors and supermarkets) have adopted modern logistics systems including modern computer and telecommunication systems that can allow them to conduct large-volume procurement and to lower their inventory holdings. Modern markets have also invested in cold chains, packing houses, and distribution centers. However, with poor public infrastructure (e.g., roads and ports), modern markets still face challenges. This paper aims to identify challenges and opportunities faced by traditional and modern market channels in their logistics systems in order to promote effective logistics systems in the agriculture supply chain in Indonesia.

Arief Daryanto is Director of the Graduate Program of Management and Business and a senior lecturer in the Faculty of Economics and Management, Bogor Agricultural University (IPB). Arief received his PhD from the University of New England, Australia. He has a long and distinguished history of working on a range of successful ACIAR projects and EVD projects on Round Table Indonesia (RTI) focusing on agricultural policy, agricultural competitiveness, livestock economics, value chains, and contract farming with smallholders. Arief publishes widely on agricultural issues in Indonesia and supervises numerous PhD and Masters students. He is now President of the Indonesian Association for MBA Programs.
Strengthening Markets of High Value Fruits and Vegetables in Mindanao: The Case of Transport and Shipping Service Improvement

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The paper highlights the important role of transport and logistics in contributing to agricultural competitiveness in Mindanao, southern Philippines. Transportation and logistics are critical components in the supply chain of high-value fruits and vegetables. The paper analyzed the impact of road and port networks on supply chain players of key fruits and vegetables with a view to recommend policy directions for the development of transportation infrastructure and improving regulations affecting the supply chain in Mindanao. The paper has two parts: (1) a macro-level analysis of the factors affecting inter-regional trade of fruits and vegetables in the Philippines, and (2) a micro-level analysis of the major supply chain participants of selected high-value fruits and vegetables coming from Mindanao.

Gilbert M. Llanto is President of the Philippine Institute for Development Studies. He is Regional Coordinator of the East Asian Development Network, a network of East Asian research institutes under the Global Development Network engaged in policy research and capacity building; Lead Convenor of the Philippine APEC Study Center Network; and Associate Editor of the Philippine Review of Economics. He is Member of the Academic Steering Committee on Financial Inclusion of the International Cooperative and Mutual Insurance Federation (ICMIF United Kingdom), and Member of the Advisory Council of the Microfinance Council of the Philippines. He was formerly Deputy Director-General of the National Economic and Development Authority and President of the Philippine Economic Society. He has a PhD. in Economics from the School of Economics, University of the Philippines. His research interests include public economics, growth economics, financial inclusion, microfinance, regional integration, and infrastructure regulation.
Enhancing ASEAN Connectivity: The ASEAN RO-RO Initiative

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The 2007 ASEAN Economic Community Blueprint calls for the transformation of ASEAN into a single market and production base. In 2009, during the 15th ASEAN Leaders’ Summit, the leaders declared that “intra-regional connectivity within ASEAN and its sub-regional grouping would benefit all ASEAN member states through enhanced trade, investment, tourism, and development.” In late 2011, the leaders adopted the Master Plan on ASEAN Connectivity. In the master plan, the establishment of an ASEAN Roll On-Roll Off (RO-RO) Network was identified as one of the key strategies on physical maritime connectivity and included among the 15 ASEAN Flagship (Priority) Projects for 2011-2015. The ASEAN Connectivity Coordinating Committee designated the Philippines and Indonesia as “co-shepherds” for the implementation of the ASEAN RORO Project. This connectivity initiative is expected to support the transport of agricultural commodities among ASEAN member states.

The first RO-RO route (Davao-General Santos-Bitung) will hopefully be launched on October 22, 2014. It is fitting that the first ASEAN RO-RO route will be established between the Philippines and Indonesia, being co-shepherds for the implementation of the ASEAN RO-RO connectivity flagship project.

Enrico (Henry) L. Basilio is the Chief of Party of the USAID Advancing Philippine Competitiveness (COMPETE) Project. One of the key mandates of the COMPETE Project is the enhancement of the agriculture sector’s competitiveness. In the past, Henry participated in various agri-related projects: USAID Accelerated Agricultural Production Project, UNDP Seed to Shelf Project, DA Strategic Transport for Agriculture. Henry served as President/Trustee of REID Foundation, Inc.; Director of the Graduate Program in Applied Business Economics, Director of the Industrial Research Foundation, and Vice President of the Center for Research and Communication of the University of Asia and the Pacific. Henry was one of the prime movers of the Philippine roll-on/roll-off (RO-RO) shipping policy in 2003. In 2010, he was appointed as Alternate Philippine Representative to the ASEAN High Level Task Force on Connectivity (that crafted the ASEAN Master Plan on Connectivity). For his efforts, Henry received from President Aquino a Letter of Commendation in 2011. Henry obtained his degree in Economics from the University of Santo Tomas, Master of Arts degree in Applied Business Economics from the University of Asia and the Pacific, and Doctor of Public Administration from the University of the Philippines National College for Public Administration and Governance.
Economy and Environment Program for Southeast Asia (EEPSEA)

The Economy and Environment Program for Southeast Asia aims to strengthen local capacity in the economic analysis of environmental problems so that researchers can provide sound advice to policy makers. The program uses a networking approach to provide financial support, meetings, resource persons, access to literature, publication avenues, and opportunities for comparative research across its nine member countries, namely, Thailand, Malaysia, Indonesia, the Philippines, Vietnam, Cambodia, Lao PDR, China, and Papua New Guinea. The International Development Research Centre (IDRC), the Swedish International Development Cooperation Agency (Sida), and the Canadian International Development Agency (CIDA) support the program.

www.eepsea.net
This paper examines the factors influencing the choice of household adaptation strategies to deal with extreme climate events in selected Southeast Asian countries. Adaptation barriers and constraints are also examined. It was found that most households undertook reactive adaptation responses in the form of evacuation and reinforcing their housing structures. The relatively well-off households took proactive measures such as building protective structures and elevated structures and relying heavily on early warning systems.

The multinomial logit regression results showed that the choice of being proactive or reactive was significantly influenced by the following factors: housing type, household size, education level, attendance at training programs on disaster preparedness, perception of the risk of future extreme climate events, the number of information channels available, and level of dependence on others for help. The probability of choosing proactive adaptation measures could be enhanced by providing those households with limited means better access to information channels, training on disaster management and adaptation options, livelihood support to enhance their economic capability, opportunities for higher education, and financial support to enable them to build stronger and more resilient housing units. Collective adaptation was hampered by the lack of cooperation among the various stakeholders and constituents.

Canesio D. Predo is an Assistant Professor at the Institute of Renewable Natural Resources, University of the Philippines Los Baños (UPLB). He holds a PhD in Agricultural Economics and an MSc in Environmental Studies from UPLB. His research expertise includes environment and natural resources valuation; bioeconomic and econometric modeling; the economics of climate variability and climate change; risk analysis and management; the economics of land use and land cover change; environmental impact assessment; systems analysis, modeling, and simulation of natural resource and human systems; and statistical analysis.
This study distills information from a cross country study on public and autonomous adaptation against climate hazards in coastal areas in Indonesia, Vietnam, and the Philippines. It analyzed both viable public strategies as well as determinants of autonomous adaptation of households in coastal communities. A participatory approach was used to engage communities in the study sites in the identification of potential public adaptation strategies. Cost effectiveness analysis (CEA) was then used to rank alternative public adaptation strategies. A multivariate probit regression was used to analyze the determinants of autonomous adaptation of households. The focus was on the interrelated hazards of coastal erosion, flooding, and saltwater intrusion. The confluence of hazards is a situation that was found to define the uniqueness of the climate change problem in coastal areas.

The bottom up approach used in identifying potential public adaptation strategies yielded more options which included infrastructure, environmental, and institutional options. CEA of these options showed that across sites, ecosystem based approaches (or natural barriers such as mangroves) are more cost effective than hard infrastructure investments. Regression results showed that households, obviously, adapt or respond autonomously to a combination of hazards. In fact, the econometric model of joint decision cannot be rejected by the data. There are also geographical differences in adaptation patterns reflecting that households react rationally to the degree of threat from these hazards. Similar to some literature we do find evidence that planned adaptation may crowd out private or autonomous adaptation. Likewise we find that trust also increases the likelihood of self-insurance and self-protection, especially against extreme events that are either recurring or permanent. Finally we also find that households’ adaptive capacity depends partly on the type of hazard and finds some logical explanation from a gender dimension. For recurrent extreme events, the abundance of male labor increases the likelihood of adaptation. On the other hand, for permanent and slow creeping hazards such as saltwater intrusion, the abundance of female labor increases the likelihood of adaptation.

Asa Jose U. Sajise is currently a Senior Lecturer at the Department of Economics at the University of the Philippines Los Baños. He has worked extensively with various organizations and funding agencies in Southeast Asia on a wide range of environmental issues. His current line of research focuses on climate change adaptation in coastal communities in Southeast Asia while most of his previous research has largely been in the fields of environmental valuation and impact evaluation. Dr. Sajise has a degree in Agricultural and Resource Economics from UC Berkeley.
Mediation Analysis of Factors that Influence Private Flood Mitigation Behavior in Developing Countries: Evidence from the Mekong Delta, Vietnam

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This paper uses protection motivation theory and mediation analysis to investigate mitigation behavior against flood hazards. We conduct a household survey and a flood-risk communication experiment with 480 respondents in flood-prone areas in the Mekong Delta, Vietnam. The results indicate that self-efficacy (i.e., evaluation of one's ability to take actions that will reduce flood risks) and response efficacy (i.e., evaluation of the effectiveness of the action to be undertaken) are consistently good predictors of flood mitigation behavior and they are important mediators within the relationships between mitigation behavior and its individual determinants. Vicarious experiences shared during flood-risk trainings and focus group discussions increase motivation for undertaking protective actions. However, the effect of focus group discussion on mitigation behavior is fully mediated via self-efficacy and response efficacy, while the effect of training is partially mediated via response efficacy. In addition, the indirect effects of most independent variables are statistically significant. This implies that ignorance of indirect effects could lead to an incorrect explanation of the factors that influence flood mitigation behavior.

Phung Thanh Binh is a lecturer and researcher at the University of Economics at Ho Chi Minh City's School of Economics. He is also currently a PhD candidate at Wageningen University's Environmental and Natural Resource Economics Group. Among his research interests are environmental economics, energy economics, climate change economics, and development economics.
Central Bicol State University of Agriculture (CBSUA)
The Central Bicol State University of Agriculture (CBSUA), formerly Camarines Sur State Agricultural College is a premier agricultural state university in the Philippines, which is located 450 kilometers south of Metro Manila. It was declared by the Philippine Commission on Higher Education as one of the National Universities and Colleges for Agriculture (NUCA) since 2010, a Center of Development for Agriculture and Teacher Education, and one of the 22 leading universities in the country per CHED Memo 9 series of 2012. CBSUA offers 65 academic programs in its four campuses, nine of which are graduate programs. It serves around 12,000 students. It pioneered the offering of two courses, the BS in Agri-ecotourism Management and the ladderized MS in Disaster Risk Management, two new programs that are inviting many students to come to the University. It is also one of the three best schools in Veterinary Medicine in the Philippines.
www.cbsua.edu.ph

Food and Agriculture Organization (FAO) Philippines
The Food and Agriculture Organization (FAO) of the United Nations is the specialized UN agency for food, nutrition, agriculture, and forestry and has been assisting the Philippines pursue its development objectives since 1978. It closely works with national government agencies, local government units, civil society organizations, academe, farmer and fisherfolk groups, private sector, donors, and international agencies.
FAO Philippines also jointly formulates the United Nations Development Assistance Framework (UNDAF) in the Philippines with other UN agencies. UNDAF represents the common framework for the UN system program of cooperation at the country level and is the UN’s response to the government’s efforts toward addressing various development priorities as identified in the Philippine Development Plan and other government policies.
FAO Philippines utilizes approaches that aim to increase the resilience of livelihoods to threats and crises; and has also used the relief, rehabilitation, and development for resilience (3Rs) approach in its emergency response projects.
www.fao.org/philippines
Helping Farm Households Cope with Climate Change and Adverse Events

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This chapter aims to provide an initial policy framework for determining priorities for government programs to reduce vulnerability to natural disasters. In particular, we provide a qualitative assessment of the risks posed by climate change to agricultural and rural households in the Philippines. We begin with the likelihood that climate change will increase the probability of flooding in the Philippines, since rainfall is expected to both increase and be more concentrated (more storms). We then turn to the issue of providing a conceptual framework for understanding resilience at the household level and use the Philippine Center for Economic Development (PCED) Social Protection Survey data to explain how the farming households cope with natural disasters. Combining the conceptual framework with the empirical analysis, we discuss some pros and cons of alternative public policies to reduce household vulnerability. Since a similar conceptual framework can be applied at the national level, we then turn to policy implications for national risk and disaster management with special attention to climate risks, including the role of discounting at the household vs. the national level.

Majah-Leah V. Ravago is Assistant Professor and currently the Director for Research at the University of the Philippines School of Economics. Her research interests include environmental and resource economics, development economics, energy economics, and experimental economics. She has co-authored a number of publications and working papers on agriculture, resource management and sustainability, and experimental games. Dr. Ravago received her PhD in Economics from the University of Hawaii in 2012.

James A. Roumasset is Professor of Economics at the University of Hawaii and visiting Professor at the University of the Philippines School of Economics. His research interests include environmental and resource economics, institutional economics, and development microeconomics. His publications and extramural grants in recent years have focused on new methods for resource and environmental policy analysis and promoting new connections between and within disciplines. He has a PhD in Economics from the University of Wisconsin-Madison.
Mainstreaming Climate Risk Management and Disaster Preparedness in Local Governance for Food Security

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A project was implemented with the aim of enhancing livelihood resilience of small-scale farmers and fisherfolk in disaster-prone areas in the Philippines through institutionalization of disaster risk reduction (DRR) in agriculture. Initially piloted in Bicol from 2009-2011 by the Food and Agriculture Organization (FAO); Department of Agriculture-Regional Field Unit V (DA-RFU V); Central Bicol State University of Agriculture (CBSUA); Bicol University (BU); and the Philippine Atmospheric, Geophysical and Astronomical Services (PAGASA) in selected local government units in the provinces of Camarines Sur, Sorsogon, and Albay, the project has been expanded in 2012 to 2013 with funding support from DIPECHO (the European Commission’s Humanitarian Aid department disaster preparedness program) covering two countries—Cambodia and the Philippines. Areas covered are three provinces in the Bicol region (Albay, Sorsogon, and Catanduanes) and Surigao del Norte in Caraga region. Selection of sites was based on its vulnerability to natural disasters.

Seven deliverables were distributed among the partner institutions. For CBSUA, the project components covered are: (1) mainstreaming disaster risk reduction and management (DRRM) in agriculture in local governance, and (2) developing a software for post-disaster damage and needs assessment (PDNA) for rice, corn, abaca, and coconut.

The paper will share the framework and process used by the project in mainstreaming DRRM in agriculture in local governance, including conduct of participatory approaches and tools in developing the plan of action for DRRM in LGUs. The development and use of the PDNA software will also be shared. The paper will conclude with lessons learned in project implementation.

Cely S. Binoya is the President of the Asia Pacific Association of Educators in Agriculture and Environment (APEAEN) for 2012–2014. She earned her PhD in Extension Education from UPLB in 1992. She took a post-doctorate online course in DRRM and Climate Change at the Earthquake and Megacities – Worldbank Institute in 2010. She is Professor and Dean of the Graduate School at Central Bicol State University of Agriculture. Some of her current research and development projects include the FAO-funded project on “Climate Risk Management and Disaster Preparedness in the Philippines for Agriculture and Fisheries” and an upscaling project funded by FAO-DIPECHO for “Enhancing Capacities for Disaster Risk Reduction in Agriculture in Cambodia and the Philippines.” She is also co-investigator and gender consultant of a five-year Bicol Agri-Water Project funded by USAID, and Program Leader of the “Integrated R&D Program for Climate Change Adaptation and Disaster Risk Reduction and Management” funded by CHED.

Vladimir R. Foronda is Associate Professor and ICT Director at the Central Bicol State University of Agriculture. He is co-investigator of the FAO-funded project on “Climate Risk Management and Disaster Preparedness in the Philippines for Agriculture and Fisheries” and an up-scaling project funded by FAO-DIPECHO for “Enhancing Capacities for Disaster Risk Reduction in Agriculture in Cambodia and the Philippines,” where he was in-charge of developing the software for post disaster damage and needs assessment (PDNA) for agriculture. He has already developed the PDNA protocol for rice, corn, abaca, and coconut and has trained LGUs in Bicol and Caraga, Philippines and Cambodia on the use of the PDNA tools.
During the onslaught of Typhoon Haiyan, the Philippines suffered extensive damage to the agricultural sector in areas where crop production and fisheries were the residents’ primary means of sustenance and livelihood. Heeding the call of the Philippine government, the first organization-wide FAO Level 3 Response was declared, which is aligned with the new FAO Strategic Objective 5 (to increase the resilience of livelihoods to threats and crises).

Using the relief, rehabilitation, and development for resilience (3Rs) approach, mutually reinforcing actions addressing risk and crisis governance, early warning and information management, risk and vulnerability reduction measures, and preparedness and emergency response were implemented. Improving management practices, introducing suitable technologies and products, and post-harvest and value-enhancing economic activities geared primarily towards women are just some of the efforts FAO is undertaking to build resilience and improve economic growth. FAO is also looking at post-harvest needs, value chain management, market analysis for key crops, and marketing logistics.

To strengthen institutional capacities in mitigating disaster risks, FAO is providing support and technical guidance on government initiatives, including those related to ongoing efforts to merge existing agenda with various sector needs. A pilot Early Warning System in Camarines Sur builds the capacity of local officials in collecting, analyzing, and utilizing food security and nutrition data for evidence-based decision making and programme planning. FAO has, prior to Typhoon Haiyan, established DRR measures for the agricultural sector in the Bicol and Caraga regions.

The response to Typhoon Haiyan highlighted the significance of effective cooperation between FAO and the Philippine Government; the importance of efficient collaboration between FAO and its partners; and the value of quality technical, support, and operational capacity from the FAO Regional Office for Asia and the Pacific. FAO continues its mandate to fight hunger amidst the increasing number of extreme disaster events by taking a collaborative and multi-dimensional approach to building resilience, enhancing relief response, and implementing comprehensive long-term rehabilitation.

Aristeo A. Portugal is presently the Assistant FAO Philippines Representative (Programme) since February 2009. Prior to this, Mr. Portugal was Agribusiness/Marketing Specialist in FAO’s projects on technical support to agrarian reform and rural development in the Philippines for almost 15 years. He also served as consultant in various agriculture related projects funded by the Asian Development Bank, USAID, and JICA. His work experience also includes 10 years with the agriculture staff of the National Economic and Development Authority (NEDA) where he was actively involved in project development, monitoring and evaluation, and policy review and analysis, among others. Mr. Portugal is a BS Fisheries graduate of the University of the Philippines where he also obtained his masters degree in industrial relations (MIR) and business administration (MBA).
International Center for Tropical Agriculture (CIAT)
The International Center for Tropical Agriculture (CIAT) of the CGIAR seeks to reduce hunger and poverty, and improve human nutrition in the tropics, through research aimed at increasing the eco-efficiency of agriculture. The Center’s research mandate includes: increasing productivity of key commodities (i.e., cassava, beans, forages, rice), sustaining tropical soil and land management, and facilitating decision and policy analysis. CIAT is the lead center for the CGIAR research program on Climate Change, Agriculture, and Food Security (CCAFS). The global headquarters is located in Cali, Colombia while its network of offices covers Latin America, Africa, and Asia including a regional hub in Hanoi, Vietnam.

www.ciat.cgiar.org

National Academy of Science and Technology (NAST)
The National Academy of Science and Technology (NAST) is the highest recognition and advisory body to the Philippine government and science community on matters related to science and technology.

It is mandated to recognize outstanding achievements in science and technology as well as provide meaningful incentives to those engaged in scientific and technological researches (Presidential Decree 1003-A) and advises the President and the Cabinet on matters related to science and technology (Executive Order No. 818). NAST likewise engages in projects and programs designed to recognize outstanding achievements in science and to promote scientific productivity. It embarks on programs traditionally and internationally expected of an academy of science.

www.nast.ph
Innovation Systems for Eco-efficient Future of Asian Agriculture

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Agricultural research has historically focused on developing innovations to promote on-farm productivity. In recent decades, this research mission has been increasingly framed within a sustainable natural resource management agenda. And most recently, it has embraced issues on vulnerabilities of agricultural systems to climate change. This paper proposes eco-efficiency—both as research vision and approach—to address the growing complexity of agricultural development challenges.

The vision of an eco-efficient future for agriculture focuses on the smarter use of natural resources towards achieving development outcomes—for food security, income, and nutrition—under growing threats of climate change. Key pathways to eco-efficiency include: (1) large-scale adoption of better crop varieties & management practices, based on sound agro-ecological advice; (2) increased investment in best practices that offer large enough gains to compensate farmers for greater risks; (3) reduced investment in inputs that are being over-used; (4) more efficient use of resources to obtain greater returns at lower costs—ecological, agronomic, socio-economic; (5) spread of technologies that make possible quantum leaps in agricultural productivity; and (6) protection against future losses in productive capacity.

In Asia, the International Center for Tropical Agriculture (CIAT) develops eco-efficient solutions to boost yields, incomes, and overall livelihoods of poor agricultural producers and consumers. This paper presents examples of CIAT collaborative research with national and regional partners, to support innovation systems for eco-efficient agriculture through:

1. Adding value to cassava for diverse markets and uses
   • Diversified cassava value chains through improved varieties and crop technologies
   • Reduced crop losses from biotic factors
   • Increased cassava utilization in agri-food systems
2. Enhancing forages integration and access for smallholder livestock production
   • Improved forage options for smallholders
   • Increased availability of high-yield and quality forage systems
   • Improved ecosystem services in integrated crop-livestock systems
3. Sustaining diversified livelihoods in crop-livestock systems
   • Improved livelihoods for smallholder producers through cassava-forage integration
   • Diversified cropping systems through integration with other key cash and food crops
   • Improved productivity and resilience of agri-landscapes
   • Restored soil health, better land management through actions and policies at the agri-landscape scale

Dindo M. Campilan is director for Asia at the International Center for Tropical Agriculture (CIAT). He leads CIAT’s regional research portfolio covering: cassava value chains, forage-livestock systems, and agricultural systems and landscapes. Previously he worked with the International Potato Center (CIP) as regional program leader and senior scientist for food security and livelihood in Asia. He holds a PhD in Agriculture and Environmental Science (communication and innovation studies) from Wageningen University.
Eco-efficient agriculture is competitive and profitable as well as sustainable and resilient, thus generating multiple benefits for the poor. In the face of climate change, the term climate-smart agriculture (CSA) has been coined. The approach is increasingly being used among scientists, policy makers, and donors. Although CSA overlaps with many of the components of previously well-known concepts such as eco-efficient agriculture, conservation agriculture, sustainable agriculture, agroforestry, and sustainable land management, the concept’s popularity emerges from its recognition of the inextricable link between food security, adaptation to climate change, and mitigation of greenhouse gases, specifically the synergies and trade-offs among the three pillars. We will focus here on CSA, as we have developed a searchable global compendium of CSA practices that allows filtering of CSA practices according to specific contexts, such as production systems, and assessing their performance associated with adaptation, mitigation, and food security indicators. The compendium together with the newly developed prioritization framework allows decision makers to select, shortlist, and to quickly ex-ante assess potential CSA practices. First, we give an overview on the projected impacts of climate change on agriculture, specifically on the 20 most important crops, in the Greater Mekong Sub-Region (GMS) by 2050. Secondly we demonstrate the usefulness of the compendium and the prioritization framework by identifying potential CSA practices that will contribute to more resilient food systems in the context of progressive climate change for the GMS. The mentioned examples are part of the wider methods, tools, and databases available from the global decision and policy analysis research area at CIAT. Specific additional examples are global ready-to-use current and future climate databases and crop suitability models; novel data mining and analytical techniques for big data, seasonal weather forecast schemes, and weather insurance packages; and near real-time land use change monitoring.

Peter Läderach is leader of the Climate Change Program at the International Center for Tropical Agriculture (CIAT). His research interests cover: climate change adaptation and mitigation, climate impact modeling, and crop suitability assessment. He also serves as CIAT’s global focal person for the CGIAR Climate Change, Agriculture, and Food Security (CCAFS) Research Program. He holds a PhD in Agronomy from the Rheinische Friedrich-Wilhelms-Universität, Germany.
Capacity Development and Institution Building for National Agricultural Innovation Systems

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France is an agricultural country, where food and agriculture exports, inside (60%) as well as outside (40%) Europe, is equivalent to 13 percent of total national exports. Meanwhile it has developed strong and long-standing partnerships with developing countries since agricultural research for development (ARD) and related capacity development are an integral part of public development aid, and meet French political objectives as well as the international agenda in the current global context of economic and food insecurity.

Climate change and global issues influence the thematic agenda for research and capacity development toward innovation. The implementation of this agenda requires interdisciplinary approaches and increased international collaboration to enable rapid and targeted responses (e.g., through the development of agro-ecology approaches).

This presentation will cover three complementary dimensions: (1) How France is restructuring its agricultural higher education and research system to promote agricultural innovation systems; (2) How France is promoting agricultural innovation platforms with its partners in developing countries; and (3) How France is contributing to a global capacity development for agricultural innovation systems through the Tropical Agriculture Platform initiative.

Frédéric Lapeyrie, Director General, joined AGREENIUM, the French consortium for agrosciences higher education and research, linking eight major organizations in France, in September 2013. Dr. Lapeyrie has a Doctor in Sciences degree and is research director at the French National Institute for Agronomic Research (INRA). He has been investigating the physiology of mycorrhizal symbiosis in forest ecosystems for more than 20 years, publishing around 80 scientific papers. He was the president of INRA research center in Nancy (France) for eight years, building European and international partnerships among forest research organizations. From 2010 to 2013 at the French Ministry for Higher Education and Research he was in charge of the European research program (Knowledge-based Bioeconomy) as well as Executive Secretary for the Commission for International Agricultural Research.
Session 6C | Higher Education & Capacity Building

Convened by SEARCA and Regional SEARCA Fellows Association

Moderated by Dr. Cecilia N. Gascon, President, Southern Luzon State University
and Dr. Josefina T. Dizon, Dean, College of Public Affairs and Development, UPLB

The Regional SEARCA Fellows Association (RSFA)

The Regional SEARCA Fellows Association (RSFA) is the organization of and partnership among SEARCA alumni throughout the region to facilitate the development of linkages among in-country associations of SEARCA Fellows and to foster collaborative research and development efforts in the region. It is conceived to be a network of regional experts to support SEARCA’s development efforts.

www.saaf.searca.org

The Role of Universities in Agriculture and Rural Development: The Case of Thailand

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Poonpipope Kasemsap is the Vice-President for International Relations at Kasetsart University in Bangkok, Thailand. Concurrently, Dr. Poonpipope is the Chairman of the International Biology Olympiad and a Member of the Advisory Board of University of California at Davis (UC Davis) Horticulture Innovation Lab formerly known as the Horticulture Collaborative Research Support Program. He holds Doctorate and Master’s degrees in Plant Physiology from UC Davis, and MS Management and BS Agriculture degrees from Kasetsart University. As an Associate Professor at KU, Dr. Poonpipope also served as Chair of the Horticulture Department and Director of the International Studies Center. His research and teaching focus on the effects of climate changes and air pollutants on eco-physiology of horticultural crops.

Higher Education for Sustainable Development: The Role of DAAD in the Region

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Ms. Janina Brill is the German Academic Exchange Service (DAAD) representative and at the same time Visiting Professor at the Department of European Languages (DEL) for German at the University of the Philippines, Diliman. She is a graduate of German Language and Literature (minor in Anthropology) at the Westfälische Wilhelms - Universität Münster in Germany. As a German Language Lecturer, Ms. Brill has experience teaching in Malaysian universities namely KDU College, University Kebangsaan Malaysia (UKM) and University Putra Malaysia (UPM). She is also a DAAD alumni herself, having been an intern at the German Section at University Negeri Jakarta (UNJ), Indonesia from 2008-2009.
**International Service for the Acquisition of Agri-biotech Applications (ISAAA)**

ISAAA is a not-for-profit international organization that shares the benefits of crop biotechnology to various stakeholders, particularly resource-poor farmers in developing countries, through knowledge sharing initiatives and the transfer and delivery of proprietary biotechnology applications. ISAAA’s global knowledge sharing network and partnerships in the research and development continuum, provide a powerful combination of science-based information and appropriate technology to those who need to make informed decisions about their acceptance and use. In addition, an array of support services completes the holistic approach to agricultural development and ensures effective implementation and timely delivery of crop biotechnologies. These services include capacity building for policy makers and scientists, regulatory oversight on such issues as biosafety and food safety, impact assessment, and science communication.

[www.isaaa.org](http://www.isaaa.org)

**SEARCA Biotechnology Information Center (BIC)**

The SEARCA Biotechnology Information Center (BIC) is one of the networks of biotechnology information centers of the Global Knowledge Center of the International Service for the Acquisition of Agri-biotech Applications (ISAAA) and hosted by the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA). It was officially established in 2000 to address the needs of the region for a highly credible, sound, and factual biotechnology information center in the Southeast Asian region accessible to various stakeholders.

[www.bic.searca.org](http://www.bic.searca.org)
2015 and Beyond: Helping Farmers Grow Plant Biotech Industry Products in the Pipeline

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Producing more food in less land presents a great, continuing challenge. Environmentally-benign technologies play a vital role in improving productivity, livelihood, and quality of life of farmers. The plant science industry as represented globally by CropLife International has developed a wide-array of plant biotech crops that aims to help farmers manage pest problems, increase yield, use nitrogen efficiently, manage abiotic stress, and grow more nutritionally-improved crops. Research on these products are in various stages—some are in early development while others are in advanced development, which could be commercially available in the next five to seven years. These crops include corn, soybean, cotton, rice, canola, alfalfa, bean, eggplant, and potato. More than the private sector, the public sector biotech R&D has more diverse product pipeline, which offers wider choices across different agro-ecological environments. Farmers across Asia and ASEAN in particular, should be able to use these technologies in a timely manner. To do so would require a menu of trade-facilitative enabling policies and regulations including efficient and effective technology-delivery systems which ASEAN member states can cooperate together as we look forward to an ASEAN Economic Community.

Siang Hee Tan is currently Executive Director of CropLife Asia, the Asian operation of an international trade association with a presence in 91 countries. At CropLife Asia, he is responsible for directing regulatory, crop protection, biotechnology and outreach programs in 15 Asian countries. Other professional experience includes set-up the Universiti Putra Malaysia’s (UPM) Genome Centre, and management of two start-up ventures developing Bioinformatics Software and Pre-natal Genetic Testing. Additionally, at Sime Darby he was responsible for: setting-up the biotechnology Section for the Sime Darby Technology Centre (genetic testing for leukemia and pre-post bone marrow transplant monitoring for the Subang Jaya Medical Centre); for managing the Northern Corridor Economic Region Project (NCER) on large scale farming; and for developing an agri-entrepreneur program. Dr. Tan holds a BSc in Plant Pathology from the Universiti Pertanian Malaysia, an MSc in Genetic Engineering from UPM and a PhD in Molecular Biology (Plant Virus) from Okayama University, Japan. Professional recognition includes a Silver Award at the 2005 Geneva International Exhibitions and Inventions of New Techniques and Products, a US Government Cochran Fellowship for biological research at Case Western Reserve University in Ohio, and UPM awards for research and development.
The Micro and Macro Impact of Agricultural Biotechnology in the Philippines: Implications on ASEAN Economic Integration

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The paper examines the microeconomic, environmental, and macroeconomic impacts of genetically modified (GM) Bt corn after 10 years of commercialization adoption in the Philippines. At the farm level, the paper analyzed six indicators (yield, farm cost, net farm income, subsistence economic carrying capacity, global cost competitiveness, and returns on investment). In addition, four environmental impact indicators (land use, fertilizer utilization, labor use, and pesticide use efficiencies) were also assessed. Finally, the paper also estimated the incremental difference between Bt corn and ordinary hybrid corn at the national level in terms of aggregate farm income pre-harvest labor savings, incremental income from seed and fertilizer sales, and postharvest labor income.

Results from 2003 to 2011 indicated that as compared to ordinary hybrid corn, Bt (GM) corn performed as follows:

- The average yield advantage of Bt corn over ordinary hybrid (OH) was 19 percent;
- The Bt corn cost advantage over OH was 10 percent;
- The real net farm income advantage was 8 percent;
- The subsistence economic carrying capacity advantage of Bt corn was 29 percent; and
- Return on investment (ROI) advantage of Bt corn was 42 percent.

In terms of environmental impacts, the study showed that Bt corn seed users were more efficient by 15 percent than OH seed users in terms of land use; 9 percent more efficient in fertilizer use; 26 percent more efficient in labor use; and 54 percent less in pesticide use.

The paper also estimated that the combined macroeconomic impact of Bt corn in the Philippines was PHP 17,178 billion (USD 399.5 million) in 2011. These came from incremental net farm income (PHP 6,945 million); pre-harvest labor savings (PHP 774 million); incremental income from seed sales (PHP 4,710 million); incremental income from fertilizer sales (PHP 3,416 million); and postharvest income multiplier (PHP 1,333 million).

Finally, the paper examined the implications of the ASEAN economic integration in 2015. The paper recommended ASEAN complementation strategies in trading with the big three, China, Japan, South Korea (ASEAN+3) and other countries (New Zealand and Australia) under ASEAN+2; and the harmonization of ASEAN biosafety regulatory frameworks, quality standard setting, and capacity building activities under the Cartagena Protocol on Biosafety.

Leonardo A. Gonzales obtained his PhD in Agricultural Economics from the University of Tennessee under a Fulbright-Hays Scholarship. He was a former Liaison Scientist for Asia cum Research Fellow of the International Food Policy Research Institute, USA, and Agricultural Economist of the International Rice Research Institute. He has authored eight books on rice and corn policy and has written over 180 technical articles in agricultural policy, agribusiness, and agribiotechnology. Dr. Gonzales has familiarity and technical knowledge on the issues concerning the socioeconomic impacts of living modified organisms (LMOs). In addition, he has a vast experience in the field of biosafety, having served as the Community Representative of the National Committee on Biosafety of the Philippines (NCBP) from 2000 to 2008 and of the DOST-Biosafety Committee from 2009 to the present. He is the founding President and Chairman of the Board of Trustees of the Society Towards Reinforcing Inherent Viability for Enrichment (Strive) Inc.—a non-profit, non-stock organization engaged in policy research, advocacy, and values education. The foundation’s focus are on expanding farmers’ access to the resources they need to create sustainable livelihoods by providing technomanagerial assistance to existing local organizations; advocating for economic policies through research on grains, high-value commercial crops, livestock, fisheries, and other agribusiness enterprises that maximize farmers’ economic opportunities; building a knowledge base on effective strategies for agricultural development by forging partnerships and establishing linkages among national agencies, NGOs, private, and international institutions.
Delivering Biotech Seeds to Farmers Requires a Functional Regulatory System

Dr. Saturnina C. Halos
Chair, Biotechnology Advisory Team,
Department of Agriculture, Philippines

Biotech seeds are seeds of varieties developed through the techniques of modern biotechnology with the direct transfer of desirable genes into the crop done in the laboratory.

The rapid adoption of biotech varieties is considered one of the fastest in the history of agriculture attesting to numerous advantages such as increased yields and incomes, facility in management, health and environmental safety that are appreciated by millions of small and progressive farmers in 27 countries. To further expand the adoption of biotech seeds in other countries, a functional regulatory system needs to be established. This is embodied in the Cartagena Protocol on Biosafety, the international agreement regulating the trans-boundary movement of modern biotechnology products. In addition, a functional regulatory system addresses the safety issues often raised against biotech crops. A functional regulatory system for biotech crops ensures that biotech crops entering and being utilized and planted in a country are safe for people, animals, and the environment. For a regulatory system to be functional, it must be science-based, transparent, predictable, manageable, and responsive. The Philippines is one of the few developing countries that has a functional regulatory system for biotech seeds. The paper shall discuss how a functional regulatory system for biotech seeds was established and managed in the Philippines along with experience in other countries.

Considered one of the pillars of Philippine biotechnology, Saturnina Halos has assisted the Department of Agriculture in developing and overseeing implementation of its policies and programs in biotechnology and chairs its Biotechnology Advisory Team. She has actively participated in the drafting of GM crop regulatory policies and has served as technical consultant to the Philippine Congress in the drafting of the Agriculture and Fisheries Modernization Act of 1997 and in the preparation of various agricultural bills and resolutions to the COCAFM 2009-2010. Dr. Halos has established the first functional forensic DNA analysis laboratory in the country. She has more than 40 years experience in teaching, research, and extension in molecular biology and biotechnology in various capacities in a number of universities and governmental departments. She has more than 80 scientific articles and books in biotechnology and biosafety. Dr. Halos holds a BSc in Agriculture (Agronomy-Plant Breeding) magna cum laude from the University of the Philippines Los Baños and a PhD in Genetics from the University of California Berkeley, USA.
PARALLEL SESSION D
THEME 2 - Inclusive Value Chains

SESSION 2D | Inclusive Value Chain of Agricultural Crops
Convened by CIRDAP

Moderated by Dr. Hossein Shahbaz | Director, Pilot Projects and Director-in-Charge, Research Divisions, CIRDAP

Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP)

CIRDAP is a regional, intergovernmental, and autonomous organisation. It was established on 6 July 1979 at the initiative of the countries of the Asia-Pacific region and the Food and Agriculture Organization of the United Nations (FAO) with support from several other UN bodies and donors. The Centre was set up to meet the felt needs of the developing countries as an institution for promoting integrated rural development in the region. From the original six members, CIRDAP has now grown into a Centre of 15 member-countries. The member-countries are Afghanistan, Bangladesh (Host State), Fiji, India, Indonesia, Iran, Lao PDR, Malaysia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Vietnam. Operating through designated contact ministries and link institutions in member countries, CIRDAP promotes regional cooperation. It plays a supplementary and reinforcing role in supporting member-countries and furthering the effectiveness of integrated rural development programs in Asia and the Pacific.

www.cirdap.org
Marketing of Fruits and Vegetables in Sri Lanka through Competitive Supply Chain Management

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Fruit and vegetable production in Sri Lanka is highly seasonal due to natural rainfall patterns. The majority of farmers grow their crops during the rainy season resulting in surplus production at the market. Excess production exceeds the demand hence prices of produce are badly affected. Fresh crops reach different types of consumers through various supply chains. Three major supply chains are available and the quality of the fresh crop depends on the type of supply chain. Most fresh crop produced by farmers reach consumers through Dambulla and Colombo-based wholesale markets. More than 96 percent of fresh produce move through this chain. The very high price uncertainty of crops in this chain causes low attention paid to high quality production and packaging used for transport. A large number of isolated intermediaries are involved in this chain. Although consumers in this supply chain are not quality conscious, they are sensitive to price changes. The second supply chain is “government involved marketing.” Two major institutes are engaged in this system. One of the major differences of this chain is limited intermediaries involved in marketing. Fresh crops are transported in plastic crates hence the quality is protected. The price gap between grower and consumer is lowered compared to the major supply chain. The third supply chain involves supermarkets and exports that involve marketing. This supply chain is highly specialized; quality is very well maintained from harvesting to retail level. A few cold chains are also in operation. The extent of fresh produce that move through this type of marketing chain is around 3 percent. Farmers are paid a higher price for their high quality produce, which are sold at reasonable prices by reducing wastage and maintaining quality. Based on this information, upgrading the chain management practices can improve the marketing efficiency of fresh produce in the country since and may even produce marketable products in specialty markets. Hence, the marketing problem of fresh crops can be overcome through competitive supply chain management of fruit and vegetables.

Kalehe Hewage Sarananda is a Research Officer at the Department of Agriculture of Sri Lanka. Among his duties is the design and conduct of postharvest research, particularly on minimizing postharvest losses of fruits and vegetables and on strategies towards meeting the challenges of growers and traders. Technology transfer is also an important part of his responsibilities. Dr. Sarananda is a visiting lecturer in many universities in Sri Lanka and has served on advisory boards and committees on curricular development in a number of these. He has also served as Board Member of the Institute of Postharvest Technology, the Cthi Rich Food Processing Memorial Center, and of the Food Science and Technology, Post Graduate Institute of Agriculture, University of Peradeniya. He has over 50 publications in his name. Dr. Sarananda has a PhD in Horticulture from the Wye College, University of London, United Kingdom. He earned his MSc in Horticulture from the University of the Philippines Los Baños, and his BSc in Agriculture from the University of Peradeniya, Sri Lanka.
Supply Chain and Value Chain Development of Shallot in Indonesia

Y. Aris Purwanto is an Associate Professor in the Department of Mechanical and Biosystems Engineering, Faculty of Agricultural Engineering and Technology and the Center for Tropical Horticulture Studies of Bogor Agricultural University, Indonesia. Dr. Purwanto has served the University in various capacities, including heading various research centers. His more recent body of research has focused on tropical fruits: ripening systems, postharvest handling, postharvest losses, and long-term storage. He has likewise worked on the development of variety and technology for main and indigenous vegetables and the development of shallot production, both in support of food security. He has numerous publications based on his research work. Dr. Purwanto earned his MSc and doctorate in Biological and Environmental Engineering from the University of Tokyo where he also did a post-doctorate in the same field. He has a BSc in Agricultural Engineering from the Bogor Agricultural University.
PARALLEL SESSION D
THEME 3 - Sustainability and Poverty Reduction

SESSION 3D | Integrated Ecosystem Management
Convened by GIZ
Moderated by Ms. Erlinda F. Dolatre, Senior Adviser, Policy Dialogue and Strategic Steering, Environment and Rural Development Program, GIZ

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

GIZ is a federally-owned enterprise that supports the German government in the field of international development cooperation. For more than 30 years now, GIZ has been cooperating with Philippine partners in strengthening the capacity of people and institutions to improve the lives of Filipinos in this generation and generations to come. Together we work to balance economic, social, and ecological interests through multi-stakeholder dialogue, participation, and collaboration.

Most of its activities are commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). GIZ also operates on behalf of other German ministries—in particular the Federal Foreign Office, the Federal Environment Ministry, and the Federal Ministry of Education and Research—as well as German federal states and municipalities, and public and private sector clients both in Germany and abroad. These include the governments of other countries, the European Commission, the United Nations, and the World Bank.

www.giz.de
Integrated Ecosystem Management from Ridge to Reef

GIZ and Partners

Like many developing countries, land and water resources in the Philippines are under high pressure due to increasing demographic growth as well as fragmented planning and management of public and private lands including vast areas in the ancestral domains. This creates high stress on ecosystems due to unresolved conflicting resource uses for settlements, agriculture, fisheries, mining, or forestry. The management of land will play a crucial role for the anti-poverty strategy of the Philippines in the future, not only to provide space for food production but also for urban growth, nature conservation, and industrial development.

Local government units (LGUs) in the Philippines face a fragmented regulatory framework and often-weak support systems. This makes it difficult for LGUs to plan, manage, and develop their territory in an integrated and sustainable manner. Incentives and control systems for implementation of plans and proper management of natural resources are insufficient.

Although cities and municipalities are mandated to develop comprehensive land use plans (CLUP) and manage their entire territory, they are faced with different regulatory agencies in the field of land use and development planning.

In response to the deficiency of integrated planning and management of land at the local level, GIZ supported the development of an integrated ecosystem planning and management approach that aims at integrating the planning and management of various ecosystems (from ridge-to-reef) so local governments can manage their territory in a coherent manner.

The GIZ-supported land use planning and management tool (Sustainable Integrated Management and Planning for Local Government Ecosystems, SIMPLE) has been developed to help local governments undertake integrated comprehensive land use planning and to manage their land area more effectively. It provides for an integrated ecosystems planning and management approach that sees the holistic importance for the entire land territory of the local government. The tool contains process descriptions, training modules, and management instruments for provinces, municipalities, cities, and villages (barangays).

The Guidelines for the implementation of the CLUP by the Housing and Land Use Regulatory Board (HLURB) have drawn on the experiences and integrated them into the new HLURB CLUP 2013/2014 guidelines. Currently, a national roll-out of the CLUP Guidebook Series is supported by GIZ.
Opportunities for Up-scaling Ecosystem-based Climate Change Adaptation Measures as Risk Management Strategy in Crop Production in Southeast Asia

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SEARCA

Southeast Asian countries are among those highly vulnerable to climate hazards such as temperature increase; erratic rainfall distributions; extreme climatic events including typhoons, floods, and droughts; and sea level rise. These climate hazards have adverse effects and impacts on agriculture and rural development in the region since the economy in most of these countries is largely dependent on agriculture. Climate risks threaten not only agricultural productivity but also ecological stability and environmental sustainability, and thus indirectly, food security in the region. Thus, effective and efficient climate change adaptation strategies in agricultural production are imperative to relieve the poor farmers of the bondage of poverty.

While there exist good agricultural practices of adaptation to changing climate in the different countries in the region, climate resilience in agricultural crop production systems can be enhanced through possible up-scaling of a suite of ecosystem-based climate change adaptation (CCA) measures as part of a climate risk management strategy. These CCA measures modified to suit local conditions can contribute significantly towards reducing exposure and sensitivity as well as enhancing adaptive capacity. Recent case studies of the ASEAN Technical Working Group on Agriculture and Research Development (ATWGARD) Climate Resilience Network of ASEAN member countries have identify a set of priority CCA measures in rice and other crops that may be up-scaled, namely: use of stress-tolerant varieties; adaptive planting date and cropping calendar; alternate wetting and drying technology; integrated crop, water, and nutrient management; and agri-insurance. The paper presents the technical requirements of each of the CCA options that may be considered for up-scaling in other areas; identifies the implementation challenges and operational issues that must be addressed; and offers recommendations for providing opportunities through networking and collaboration with the needed institutional support, operational platform, and infrastructure for information exchange.

Felino P. Lansigan is a Professor of Statistics at the University of the Philippines Los Baños (UPLB). He is currently the Dean of the UPLB College of Arts and Sciences and co-chair of the UPLB Climate Risk Studies Center. He is member of the Philippine Climate Change Commission technical panel of experts in ecology and environment. He is also a Lead Author of the IPCC Working Group II for the Second and Fifth Assessment Reports (2001 and 2014). He served as Team Leader of the DA-FAO-MDGF project on capacity building and climate change adaptation in the fragile ecosystem of the Cordillera region in northern Philippines (2009-2011). He is presently the Team Leader of the World Bank-DENR-PhilCCAP (Philippine Climate Change Adaptation Project) component on Climate Change Resilience of Protected Areas. Professor Lansigan is currently Regional Coordinator of the ASEAN-GIZ-SEARCA Initiative on the Promotion of Climate Resilience in Rice and other Crops. Professor Lansigan has authored and co-authored a number of scientific articles published in international journals as well as books and monographs. He is a Coordinating Lead Author of the book Changing Philippine Climate: Impacts on Agriculture and Natural Resources published by UP Press in 2014.
Identifying Agricultural Safeguard Areas—A Practical Example of a Climate Change Adaption Measure

Mr. Matthias Niggel
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GIZ

It is widely acknowledged that climate indicators such as temperature, rainfall distribution, or the intensity and frequency of extreme climatic events including typhoons, floods, and droughts are increasingly deviating from known patterns in the past. In most countries agricultural production is highly interrelated with outside circumstances. If these change, the way agricultural production is planned and executed needs to change, too. Some of these changes are within the sphere of influence of provincial- and municipality-level planning authorities. The delineation (or not delineation) of land for agricultural production in land use and development plans is one such example. Delineation as agricultural land may also be tied to certain conditions. One example could be the presentation of flood mitigation strategies for flood-prone areas. In Southeast Asia large population groups still depend on agricultural production as livelihood. Shifting agricultural production from ‘not (anymore) safe’ places to ‘safe(r)’ places considering known data on climate change is a process that will, and from an economic perspective, should never be entirely ‘completed’. However, public and other support to identified, assessed, and delineated safeguard areas will support the gradual shifting of agricultural production to risk-assessed areas in the long-term. In the short-term it will support sustained basic food production even in cases of extreme weather events. The presentation illustrates how data typically generated during land use and development planning processes can be used to identify such priority or safeguard areas, how missing data can be generated and how specifically GIZ starts using such data, among other considerations, in deciding on the allocation of resources.

Matthias Niggel graduated with a business degree (Dipl.-Kfm.) from the University of Tübingen, Germany. He has extensive experience in agricultural projects in the Philippines. He headed for several years the Strategic Corporate-Community Partnership for Local Development Program (SCOPE), a joined initiative of GIZ and the Philippine Business for Social Progress (PBSP), linking Philippine-based companies and local producers. Thereafter he worked in the private sector to establish an agricultural distribution company. Matthias Niggel re-joined GIZ in 2012, coordinating, among others, GIZ Philippines’ corporate partnership program. Since May 2014, Matthias Niggel is Chief Advisor of the Environment and Rural Development (EnRD) program and implements the EnRD component on ‘Support to Rehabilitation of Yolanda-affected Areas’ on behalf of the German Government.
Centre for Non-Traditional Security Studies, S. Rajaratnam School of International Studies, Nanyang Technological University

The Centre for Non Traditional Security (NTS) Studies, based in the S. Rajaratnam School of International Studies (RSIS), maintains research in the fields of climate change, food security, energy security, health security, as well as internal and cross border conflict. It produces policy-relevant analyses aimed at furthering awareness and building capacity to address NTS issues and challenges in the Asia Pacific region and beyond. The Centre also provides a platform for scholars and policymakers within and outside Asia to discuss and analyze NTS issues in the region. The Centre is the Coordinator of the ASEAN-Canada Research Partnership (2012–2015) supported by the International Development Research Centre (IDRC), Canada. It also serves as the Secretariat of the initiative.

www.rsis.edu.sg/nts
EU-Southeast Asia S&T Collaboration for Food Security: The CIRAD Experience

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CIRAD (the French Agricultural Research Centre for International Development) is a public industrial and commercial institution. Collaborative research conducted by CIRAD contributes to food security by increasing agricultural production through ecological intensification (breeding, disease control, improved cropping systems, biomass recycling); improving competitiveness of products and farmers’ income (quality, production costs); improving food safety and quality; and adding value to traditional local products.

Building on cumulated expertise gained from collaborative projects in some fifty countries in Africa, Latin America, and Asia and the Pacific, CIRAD has designed a geographical partnership strategy based on shared research and training platforms. Such platforms gather S&T partners willing to collaborate and share long-term commitments in terms of human, material, and financial resources. They generate impact-driven science and provide answers to development challenges through world-class training, research and innovation.

Based in Vietnam, the MALICA (Market and Agriculture Linkages for Cities in Asia) consortium with CIRAD, the Vietnam Academy of Agricultural Sciences, and the National University of Laos builds and reinforces the capacity of students, academics, public bodies as well as private groups in analyzing food markets and city/country relationships. Methods for the analysis of consumption and commodity chains are applied to two priority research fields: increasing quality in the food sector and the comparative advantages of periurban and rural flows. Activities within MALICA focus on the application of these methods to the vegetable, pork, and maize supply chains and to the impact of various distribution chains on poverty alleviation.

Following the One Health approach, GREASE is a regional network aimed at supporting research activities for a better management of emerging epidemic risks in southeast Asia. It deals with emerging trans-boundary animal infections and zoonotic diseases. GREASE was designed as a research and training platform implemented by CIRAD and partners in Thailand, Cambodia, Vietnam, Lao PDR, and the Philippines.

The CANSEA (Conservation Agriculture Network for South East Asia) platform gathers seven institutional partners in Cambodia, China, Indonesia, Laos, Thailand, and Vietnam to generate innovative farming systems aimed at restoring soil fertility in degraded areas and develop eco-friendly and climate-resilient agriculture intensification in SEA.

Alain Rival is an agronomist by training and he received his PhD in Plant Biotechnology from the University of Montpellier in 1988. He spent the first years of his career (1985–1995) running collaborative plant biotechnology programs overseas (Ivory Coast, Indonesia, Malaysia, Costa Rica). He designed and managed international research projects in plant sciences dedicated to the improvement and dissemination of innovative planting materials in the tropics. Dr. Rival was Research Director in Life Sciences at the University of Paris in 1997 and has been a professor in biology and physiology since 2002. Alain was awarded a Marie Curie Outgoing International Fellowship from the European Commission to conduct research at CSIRO Plant Industry (Australia). Dr. Rival is the author of more than 60 research articles and book chapters. He is presently the CIRAD Resident Regional Director for South East Asia, based in Jakarta, Indonesia.
There exists a fundamental disconnect in most of the discussion and debate on food security. The general assumption seems to be that it is the principal role of government to help nations secure their food supply. But this assumption is deeply flawed for it fails to understand the significant contribution the private sector can and must make; and it discounts what can be achieved through collaboration between governments, the private sector, and nongovernment organizations (NGOs).

The private sector plays a crucial role in bringing new technology and knowledge to growers to make agriculture more productive, efficient, and profitable while also being sustainable. A holistic approach is needed—the trilogy of technology, resource efficiency, and rural development.

In the absence of far greater collaboration between the private sector, governments, and NGOs, however, we stand little chance of being able to improve the livelihoods of the millions of smallholder farmers that make up Asia’s food production system.

Syngenta’s experience with multi-stakeholder collaborations such as the World Economic Forum New Vision for Agriculture Grow Asia and Grow Africa programs is that technology providers, governments, and NGOs can come together, linking through the value chain to deliver productivity and profitability improvements for smallholder farmers.

The framework provided under such collaborations helps build trust in a pre-competitive environment and encourages participants to play to their strengths, whether delivery of technology and transfer of knowledge in the field, improving infrastructure, or access to markets. Importantly all such collaborations must have in place appropriate governance and accountability to be really effective.

Smallholder growers have also directly benefited from Syngenta’s direct collaborations with government agencies such as USAID, with research organizations such as IRRI, and with not-for-profit enterprises such as Business for Millennium Development.

Andrew McConville has been Head of Corporate Affairs for Syngenta in the Asia Pacific since 2008. Based in Singapore, he is responsible for the management of the company’s reputation and stakeholder relationships across the region in government and public affairs, public policy and partnerships, media relations, internal communications, community relations, corporate responsibility and issues and crisis management. Andrew has 20 years of experience in agricultural issues management, public relations, and corporate affairs. He has worked in the private sector—both corporate and consulting—and also spent several years working in government, managing issues and stakeholders in the Asia Pacific region, the United States, Europe, and South America. Andrew holds a first class honors degree in Agricultural Economics from the University of New England and a Master of Science in Agricultural Policy from Oxford University.
Promoting Food, Agriculture, and Environment Education in S&T Collaboration for Food Security and Food Safety in Cambodia

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A project on “Promoting Sustainable Agriculture at Kampong Cham Province in Cambodia” supported by the Japan International Cooperation Agency (JICA) has been implemented by a consortium consisting of the Institute of Environment Rehabilitation and Conservation (ERECON) and Tokyo University of Agriculture (TUA) in Japan in collaboration with the Royal University of Agriculture and the Ministry of Agriculture, Fisheries, and Forestry in Cambodia. The target area is in Samroung commune, Kampong Cham province, where over the past decade there has been increasing use of agricultural chemicals concomitant with degradation of the soil and water environment. The incidence of throat pain and dermatitis among local farmers has also increased. The project’s goal is to promote sustainable agriculture based on natural resource ‘circulation’ at 11 villages in Samroung commune (in 2012 the population was 8,447 people in 1,792 households). Target beneficiaries are the local farmers and students in the elementary schools in Samroung commune. The project has 4 activity stages—forming farmers’ groups and promoting sustainable agriculture based on natural resource circulation (Activity 1); establishing and managing the Pellet Compost Center (Activity 2); promoting distribution and sales of products with low chemical input (Activity 3); and promoting education on food, agriculture, and the environment for agricultural successors (Activity 4). One of the highlights of this project is to produce pellet compost and apply it to farmlands of local farmers. The materials and process of making pellet compost were studied in Khon Kaen University, Thailand as well as TUA and the outcomes have been spread through extension work. Also, microorganism contamination in compost was found and research is currently ongoing at the Faculty of Regional Environment Science in TUA, the Institute of Environment Rehabilitation and Conservation, and the Royal University of Agriculture, Cambodia.

Machito Mihara is Professor at the Faculty of Regional Environment Science, Tokyo University of Agriculture, as well as President of the Institute of Environment Rehabilitation and Conservation, Japan. The Institute of Environment Rehabilitation and Conservation is a non-profit organization registered by the Tokyo Metropolitan Government for research and extension programs. Dr. Mihara’s research interest is sustainable rural development focusing on soil and water conservation. He was Visiting Professor at Faculty of Agriculture, Khon Kaen University, Thailand (April 1998–March 1999) and at Royal University of Agriculture, Cambodia (April 1999–March 2013). He received his Bachelor of Agriculture from Tokyo University of Agriculture, his Master of Agriculture from Ibaraki University, and his Doctor of Agriculture from the United Graduate School of Agricultural Science, Tokyo University of Agriculture and Technology in March 1993. Currently, he has been focusing on food, agriculture, and environment education for promoting education for sustainable development, in Greater Phnom Penh, Cambodia.
PARALLEL SESSION D
THEME 5 - Institutions and Governance

SESSION 5D | Land Markets and Land Tenure
Convened by UPSE-PCED
Moderated by Dr. Ramon L. Clarete | Professor and Dean, UPSE

University of the Philippines, School of Economics (UPSE)
UPSE is the only institution in the country today with an internationally-recognized PhD program in economics. Awarded as the Center of Excellence in Economics in 1999 by the Commission on Higher Education, the School is known for graduates who have been rigorously trained and prepared to become leaders in the field. Many of the prime movers in government, business, civil society, and academia obtained their formal training in economics from UPSE.

www.econ.upd.edu.ph/

Philippine Center for Economic Development (PCED)
PCED was created on 15 March 1974 by Presidential Decree (PD) No. 453 with the primary responsibility of giving “…financial and moral support to the research, teaching, training, and other programs of the School of Economics, University of the Philippines.” Through PCED, UPSE undertakes its academic functions at a larger scale while still maintaining a high degree of independence, relying on faculty initiative as the prime means of developing competent training and research.

www.pced.gov.ph
We review the case for and against land reform as an instrument for the pursuit of economic welfare as well as pertinent evidence, especially from Asia. The first argument for reform is that small farm agriculture is more efficient than commercial agriculture as buttressed by evidence showing an inverse relationship between farm size and yield per hectare. The second argument rests on the canonical theory of share tenancy according to which share contracts impose substantial moral hazard on tenant workers. The third argument is that land reform is an effective device for uplifting the poor. We evaluate these arguments in light of other theories and evidence, concluding with suggestions for moving forward.
Comprehensive Agrarian Reform Program (CARP): 
Time to Let Go

Dr. Raul V. Fabella
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This paper revisits the record of the Philippine Comprehensive Agrarian Reform Program (CARP) over the quarter century of its existence. By 2014, 5.05 million of the 5.37 million hectares of targeted agricultural land shall have been distributed. As a program for land asset equity, it shall have accomplished 99 percent of its target—whopper of a success for a government program. As a program to advance the economic welfare of farmers, it has accomplished the opposite of its stated goals. Productivity has fallen drastically in coconut and sugar and poverty incidence among agrarian reform beneficiaries in agrarian reform communities stood at 54 percent in 2011 higher than for farmers in general. CARP and CARPER (Comprehensive Agrarian Reform Program Extension with Reforms) have created a new class of people: the landed poor. The paper then explores the many design and implementation flaws that has brought this sad result among which are: CARP’s illegalization of the market for land assets (Section 27) sending Coasean bargains underground and the 5-hectare land ownership ceiling leading to the demise of the legal rural financial market and the flight of private capital.

It is time to shift from land equity to farm efficiency. The paper argues for the return of the market in rural production: let productive farmers legally cultivate 10 or more hectares as the market dictates; let firms registered with the Philippine Stock Exchange legally operate agro-industrial farms without land ceiling. Poverty reduction requires the shift of resources and manpower from informal to formal sectors. CARP has done the opposite. To echo the architect of the great Chinese economic miracle, Deng Xiaoping, “It is time to stop redistributing poverty!”

Raul V. Fabella is one of the Philippines’ National Scientists. He obtained his PhD. in Economics at Yale University. He took his Masters Degree in Economics at the University of the Philippines where he served as Dean from 1998 to 2007. His current fields of interest are economic theory, agricultural economics and international economics.
PARALLEL SESSION D
THEME 6 - Regional Cooperation and Integration

Special Session on Plant Health and Agricultural Extension

Convened by CABI
Moderated by Dr. Wai-Hong Loke | Regional Director South East Asia, CABI, Malaysia

Centre for Agricultural Bioscience International (CABI)

CABI is a not-for-profit science-based development and information organization. We improve people’s lives by providing information and applying scientific expertise to solve problems in agriculture and the environment. CABI helps address the challenges of food security by helping farmers grow more and lose less. We do this by improving crop yields, safeguarding the environment, and improving access to agricultural and environmental scientific knowledge. Our mission and direction is influenced by member countries who help guide the activities undertaken. These include scientific publishing, development projects and research, and microbial services.

www.cabi.org
Enhancing Sustainable Pest Management through 
Ecological Engineering Approaches

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Pest management in many agricultural crops in Southeast Asia today faces numerous challenges. Food crops will need higher production to keep pace with population growth. An important challenge to achieve this is to prevent losses to pests and diseases in a sustainable manner. The demand for more intensification in agriculture can lead to larger areas of monocrops which lack the necessary natural biodiversity to manage pests. With increase in world travel, transportation, trade, and weak border/quarantine controls, many Southeast Asian countries are vulnerable to invasive species. Climate change is another potential threat as the elevated temperatures and weather extremes can exacerbate pest and disease development. Furthermore wind patterns are likely to change thus providing new transport systems to both invasive and more virulent strains of pests and diseases between countries in the region.

At the same time as the above scenario is escalating, agricultural R&D investments and endeavors in Southeast Asian nations have not increased sufficiently. In most countries there is acute shortage of skilled extension personnel particularly with pest and disease diagnostic expertise and knowledge. Pest management extension is generally weak and in most cases nonexistent. Since accurate diagnosis is a vital first step toward solving pest and disease problems, this dearth is a major challenge for Southeast Asian nations as it can easily fuel pesticide overuse/misuse.

Besides poor diagnostics, weak pesticide market regulatory systems in most Southeast Asia countries are major factors in today’s rampant pesticide misuse. In addition to posing threats to human health, wild life and both terrestrial and aquatic environments, pesticide misuse is causing major pest outbreaks which threaten agricultural production.

Ecological engineering approaches involve practices that will increase biodiversity and ecosystem services and reduce the threats of pesticides to two highly important ecosystem services, viz. pollination and biological control. The increase in floral biodiversity in non-crop habitats provide shelter, nectar, alternate hosts, and pollen (abbreviated as SNAP) to conserve the natural enemy fauna, which protect pollinators of the crops. Coupled with rational pesticide management through better pesticide regulations, accurate pest diagnosis, and timely professional advice and prescriptions to farmers, sustainable pest management can be achieved to underpin good agriculture production and rural development.

Kong Luen “K.L.” Heong is a fellow of The World Academy of Science (TWAS) and the Malaysian Academy of Science and holds a MSc from Imperial College, a PhD, and a DSc from University of London. Formerly a Principal Scientist in the International Rice Research Institute he is now the Senior Advisor to CABI South East Asia. His work to research, develop, and use innovative communication methods to reach and motivate farmers to change attitudes, restore biodiversity, improve pest management practices, and reduce fertilizer and pesticide use in rice has been recognized by US Council for Agricultural Science and Technology (Charles Black Award), TWAS Agriculture Prize, the Malaysian Plant Protection Society (Excellence Prize) and the Government of Vietnam (2 gold medals). He has won the St. Andrews Prize, the World Bank Development Marketplace Award, the COM+ Award, and the Golden Rice Award. Recently he has also developed ecological engineering approaches for sustainable pest management.
Plantwise: A Global Program to Support Sustainable and Functional Plant Health Systems for Improved Food Security and Livelihoods

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Many plant health problems threaten crop production. These include pests and diseases, soil factors such as fertility and salinity and more recently, vagaries of climate change. Global trade and tourism are added challenges to the spread and management of pests. It has been estimated that plant pests alone destroy up to 40 percent of smallholder farmers’ produce—and even higher losses are anticipated regularly in key food crops such as rice due to pest outbreaks. To alleviate the losses, farmers need advice, researchers need good pest data, and policy makers need tools for front-line decision making. In the context of global food security, helping farmers to reduce losses can therefore make significant improvements to their livelihoods and family food security.

In the tropics, resource poor smallholder farmers manage mixed enterprises with a range of subsistence and commercial crops in order to feed their families and spread risks. Slight changes in the pests’ dynamics result in changes to the livelihoods of these resource-constrained farmers. In this context, effective management of plant heath problems is crucial toward the sustenance of the supply chain and the many stakeholders who depend on it for their livelihoods. Currently, government-based extension services provide advisory services to farmers who bring their problems to them. However, not all farmers, especially those in the rural regions, are able to access such services. The CABI-initiated Plantwise program bridges that gap by going to where farmers are to solve their multitude of problems.

The global Plantwise program, modelled along the CABI-Global Plant Clinics (GPC) Initiative, was launched by CABI in 2011 in partnership with other international and national organizations that underpin and sustain global efforts to remove constraints to agricultural productivity. Plantwise essentially supports and complements national extension systems in developing countries to provide smallholder farmers with better access to the advice and information needed to help them increase food security and improve their livelihoods by losing less of what they grow due to plant health problems. This is clearly embodied in the tag line for Plantwise which is to: Lose Less, Feed More. Plantwise is functional through three key components: plant health systems, knowledge bank (www.plantwise.org), and monitoring and evaluation. The key entry point relies on the establishment and operation of plant clinic networks which provide primary plant health care and are run by trained ‘plant doctors’, supported by the global knowledge bank which is a central repository within Plantwise for plant health diagnosis and management information. In that context, the Plantwise program also provides a knowledge-rich facilitating framework for change. Plantwise is currently being implemented in 33 countries across seven CABI regional centers with more than 413 plant clinics and more than a quarter million farmers benefiting from the services. Project countries have deposited over 50,000 clinic records in the Plantwise online management system (POMS) and brought together over 127 partners both local and internationally, to make the clinic program and the knowledge bank a sustainable reality.

A. Sivapragasam is currently the Deputy Regional Director/Senior Scientist at the CABI Southeast Asia Regional Center. He has a PhD in Entomology and has worked at the Malaysian Agricultural Research and Development Institute (MARDI) for more than 30 years before joining CABI in October 2010. Siva has undertaken projects with international organizations such as FAO, IFAD, APCC, CSIRO, AVRDC, ADB, and IAEA. His current projects include the UNEP/GEF funded project “Removing Barriers to Invasive Species Management in Production and Protection Forests in Southeast Asia (International Project Coordinator); Plantwise Program for Vietnam, Cambodia, Thailand, and Myanmar (CABI Country Coordinator); EuropeAid-funded project on agricultural innovation for smallholder farmers in the Greater Mekong Sub-region to improve food security in the context of impact and adaptation to climate change and in favor of economic development (Technical collaborator); and STDF-funded project “Beyond Compliance: Integrated Systems Approach for Pest Risk Management in Southeast Asia” (Project Manager).
Tools and Ways for Effective Communication of Plant Health Research Findings

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Communication is not only about providing information but also about building relationships, raising awareness, and empowering communities with information and local knowledge. It is a two-way dialogue where parties can participate and actively engage. This presentation discusses the principles of good communications, challenges faced when communicating research findings, tools and ways of communicating with different stakeholders (with case studies related to plant health), followed by conclusions and recommendations.

General principles of good communication include (a) identifying your target audience; (b) tailoring your message to fit your audience; (c) seeking feedback to ensure that you have been understood; and (d) determining appropriate media, channels, and tools to communicate.

What challenges do we face when communicating research findings? Challenges include inadequate consultation between researchers and policy makers/practitioners/farmers; content and messages using inappropriate language (scientific vs. laymen) and technical level; (c) information overload due to inadequate synthesis/navigations; and inappropriate media, tools, and channels used.

What tools and ways should we adopt when communicating research findings to different stakeholders? Some suggested materials for specific audiences include: policy briefs, stakeholder workshops, information portals/website, and information dashboard for policy makers; research papers, capacity building events, blogs, discussion fora, and information portals/website for researchers; factsheets, mobile agro-advisory services, awareness-raising events, and technical reports for practitioners; posters, trial demonstrations, farmer field schools, mobile agro-advisory services, audio-visual materials, TV programs, development projects, plant clinics, and extension campaigns for farmers.

Several case studies are given in relation to communicating with practitioners and farmers on plant health research findings, which include CABI's Plantwise program, Direct2Farm (mobile agro-advisory services), and video communication of good seed practices in Bangladesh.

In conclusion, how we communicate will depend on who our stakeholders are, and how we target/tailor our messages and use appropriate tools to suit them. Appropriate content, language, and context are sometimes more important than tools to ensure effective communication of plant health research findings.

Qiaoqiao Zhang obtained her first degree in Agronomy from Zhejiang University, China, and her MSc and PhD degrees in Information Science from the City University of London. She has been a Guest Professor of the Chinese Academy of Agricultural Sciences since 1998. Dr. Zhang has over 20 years' experience in project management, and has carried out consultancy for ADB, DFID, IDRC, and FAO. Between 1991-2010, she led CABI's China Programme including the establishment of the CABI China Office and China-CABI Joint Laboratory for Bio-safety. When she was Deputy Regional Director of CABI Southeast and East Asia between 2009-2011, she was involved in projects largely concerning knowledge management and farmers' ICT adoption. In 2011, she was promoted to Director of Memberships, responsible for engaging 48 member countries in CABI's governance, and co-ordinating the delivery of CABI's goals in these countries.
Toward Convergence for Resilient, Equitable, and Integrated Food and Agriculture Systems in Southeast Asia

This session provides participants an avenue to learn more about collaborative opportunities relevant to ARD. Areas of focus include sharing priority thrusts and programs as well as funding facilities of development agencies. Representatives of international development organizations, whose work covers Asia and Europe, will each give five- to seven-minute presentations. An open forum will follow after the presentations.

Moderated by Dr. William G. Padolina
President, National Academy of Science and Technology (NAST)
Former Deputy Director General, IRRI
Former Secretary of Science and Technology, Philippines
SEARCA Senior Fellow

French Consortium for Research and Education in Agriculture, Food, Animal Health, and the Environment (Agreenium)
Dr. Frederic Lapeyrie
Director

Australian Centre for International Agricultural Research (ACIAR)
Ms. Cecilia Honrado
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Senior Representative
Human Security Group

Ministry of Environment - Japan
Ms. Yuko Hoshino
Coordinator of International Scientific Activities on Global Challenges

Asian Development Bank
Ms. Su Chin Teoh
Natural Resources Specialist
Environment, Natural Resources, and Agriculture Division
In this closing program, brief summary reports will be presented by each Theme Chair, highlighting the lessons learned, remaining knowledge gaps, policy implications, and recommendations gleaned from the respective workshop sessions. Prior to the conference, the Theme Chairs reviewed all the abstracts for alignment with the theme. During the conference, they synthesized the discussions in the different sessions under the themes for presentation in this session.

The Conference Technical Adviser and Coordinator will provide a final summary and synthesis. The overall Conference outputs will then be presented to invited policymakers, who will respond to the recommendations presented in a Closing Message.

**SYNTHESIS BY THEME CHAIRS**

**Theme 1: Productivity Improvement**  
Dr. Glenn B. Gregorio  
Senior Scientist/Plant Breeder and Deputy Head  
Plant Breeding, Genetics and Biotechnology Division  
International Rice Research Institute

**Theme 2: Inclusive Value Chains**  
Dr. Rolando T. Dy  
Executive Director  
Center for Food and Agri Business  
University of Asia and the Pacific

**Theme 3: Sustainability and Poverty Reduction**  
Dr. Doris Capistrano  
Regional Advisor to ASEAN-Swiss Partnership on Social Forestry and Climate Change (ASFCC) and SEARCA Senior Fellow  
Dr. Percy E. Sajise  
Honorary Research Fellow, Bioversity International  
Adjunct Professor, School of Environmental Science and Management, UPLB  
SEARCA Senior Fellow and Former SEARCA Director

**Theme 4: Food Security and Food Safety**  
Dr. Paul S. Teng  
Principal Officer, National Institute of Education  
Adjunct Senior Fellow (Food Security), Centre for Non-Traditional Security (NTS) Studies, S. Rajaratnam School of International Studies, Nanyang Technological University, Singapore  
SEARCA Senior Fellow

**Theme 5: Institutions and Governance**  
Dr. Francisco P. Fellizar, Jr.,  
Vice President, Ritsumeikan Asia Pacific University  
Former SEARCA Deputy Director

**Theme 6: Regional Cooperation and Integration**  
Dr. Nipon Poapongsakorn  
President  
Thailand Development Research Institute Foundation

**OVERALL SYNTHESIS AND WAY FORWARD**  
Dr. Cielito Habito, Conference Technical Adviser and Coordinator

**CLOSING MESSAGE**

**Mr. Vili A. Fuavao**  
FAO Deputy Regional Representative for Asia and the Pacific, FAO Regional Office for Asia and the Pacific

Master of Ceremonies: Dr. Bessie M. Burgos, Acting Program Head for Research and Development, SEARCA and Conference Organizer
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The Asia Pacific Adaptation Network (APAN), established in 2009, is a regional program for managing and applying adaptation knowledge in the region, and supports governments and other organizations working on adaptation, with special emphasis on the management of knowledge. APAN aims to build climate change resilient and sustainable human systems, ecosystems, and economies through the mobilization of knowledge; enhancement of institutional capacity and informed decision-making processes; facilitation of access to finance and technologies; and equipping of key actors in Asia and the Pacific Region with adequate knowledge for designing and implementing climate change adaptation measures. APAN also aims to build capacity of key actors to access technologies and finance in support of climate change adaptation, and integrating climate change adaptation into policies, strategies, and plans.

APAN activities are carried out by the Institute of Global Environmental Strategies (IGES), Regional Resource Centre for Asia and the Pacific (RRC.AP) located at the Asian Institute for Technology (AIT) and the Stockholm Environment Institute (SEI). The UNEP Regional Office for Asia and the Pacific (ROAP) acts as the secretariat of the Steering Committee and provides technical inputs to APAN. Sub-regional activities of APAN are carried out by its five sub-regional nodes and three thematic nodes located in Central Asia, South Asia, Southeast Asia, Northeast Asia, and the Pacific.

www.apan-gan.net

The German Academic Exchange Service (DAAD) is the largest funding organization in the world supporting the international exchange of students and scholars. Since it was founded in 1925, more than 1.9 million scholars in Germany and abroad have received DAAD funding. It is a registered association and its members are German higher education institutions and student bodies. Its activities go far beyond simply awarding grants and scholarships. DAAD supports the internationalization of German universities, promotes German studies and the German language abroad, assists developing countries in establishing effective universities, and advises decision makers on matters of culture, education, and development policy.

In 2013, DAAD funded more than 112,660 German and international scholars worldwide. The funding offers range from a year abroad for undergraduates to doctoral programs, from internships to visiting lectureships, and from information gathering visits to assisting with the establishment of new universities abroad. Voluntary, independent selection committees decide on the funding. The selection committee members are appointed by DAAD’s Executive Committee according to certain appointment principles. DAAD supports the international activities of German institutions of higher education through marketing services, publications, the staging of events, and training courses.

www.daad.de
The International Service for the Acquisition of Agri-biotech Applications (ISAAA) is a not-for-profit international organization that shares the benefits of crop biotechnology to various stakeholders, particularly resource-poor farmers in developing countries, through knowledge sharing initiatives and the transfer and delivery of proprietary biotechnology applications. ISAAA’s global knowledge sharing network and partnerships in the research and development continuum, provide a powerful combination of science-based information and appropriate technology to those who need to make informed decisions about their acceptance and use. In addition, an array of support services completes the holistic approach to agricultural development and ensures effective implementation and timely delivery of crop biotechnologies. These services include capacity building for policy makers and scientists; regulatory oversight on such issues as biosafety and food safety; impact assessment; and science communication.

www.isaaa.org

The Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) is one of the sectoral councils of the Department of Science and Technology (DOST). PCAARRD was established on 22 June 2011 through the consolidation of the Philippine Council for Agriculture, Forestry, and Natural Resources Research and Development (PCARRD) and the Philippine Council for Aquatic and Marine Research and Development (PCAMRD).

The Council formulates policies, plans, and programs for science and technology (S&T)-based research and development (R&D) in the different sectors under its concern. It coordinates, evaluates, and monitors the national R&D efforts in the agriculture, aquatic, and natural resources (AANR) sectors. It also allocates government and external funds for R&D and generates resources to support its program.

As a leader in providing S&T solutions for AANR development, PCAARRD promotes active partnerships with international, regional, and national organizations and funding institutions for joint R&D; human resource development and training; technical assistance; and exchange of scientists, information, and technologies.

PCAARRD also supports the National Agriculture, Aquatic, and Resources Research and Development Network (NAARRDN) composed of national multi- and single-commodity and regional R&D centers, cooperating stations, and specialized agencies.

Being an ISO 9001:2008-certified agency for its quality management system, PCAARRD is committed to advance and foster partnerships and reinforce the culture of relevance, excellence, and cooperation through its good governance and continual improvement programs. As such, PCAARRD will remain steadfast in catalyzing the Philippine AANR sectors toward self-sufficiency and global competitiveness.

www.pcaarrd.dost.gov.ph
The **Food Security Centre (FSC)** is a university center of excellence in development cooperation at the University of Hohenheim. One of five excellence centers of the program Higher Education Excellence in Development Cooperation (EXCEED), it is supported by the German Academic Exchange Service (DAAD) with funds from the Federal Ministry of Economic Cooperation and Development (BMZ) of Germany. FSC’s mission is to provide innovative and effective scientific contributions to reduce hunger and achieve food security, contributing toward the progress of Millennium Development Goal 1, giving particular concern to gender equality and sustainability of agricultural production. FSC builds on existing partnerships of the University of Hohenheim with development institutions in Germany and Europe, with international agricultural research centers, and with universities and regional scientific networks in Africa, Asia, and Latin America. FSC engages in interdisciplinary teaching and training of PhDs and PostDocs; demand driven and impact-oriented research; capacity building through academic exchange; capacity strengthening at universities in developing countries; and knowledge transfer, brokerage, and advisory services. Annually, FSC awards up to 29 scholarships for outstanding PhD students and postdoctoral fellows pursuing a career in academia or development collaboration.

[www.fsc.uni-hohenheim.de](http://www.fsc.uni-hohenheim.de)

The **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH** is a federally-owned enterprise that supports the German government in the field of international development cooperation. For more than 30 years now, GIZ has been cooperating with Philippine partners in strengthening the capacity of people and institutions to improve the lives of Filipinos in this generation and generations to come. Together we work to balance economic, social, and ecological interests through multi-stakeholder dialogue, participation, and collaboration.

Most of its activities are commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). GIZ also operates on behalf of other German ministries—in particular the Federal Foreign Office, the Federal Environment Ministry, and the Federal Ministry of Education and Research—as well as German federal states and municipalities, and public and private sector clients both in Germany and abroad. These include the governments of other countries, the European Commission, the United Nations, and the World Bank.

[www.giz.de](http://www.giz.de)
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Launched in 1989 by SEARCA and the five premier agricultural universities in the region, the Southeast Asian University Consortium for Graduate Education in Agriculture and Natural Resources (University Consortium), is a commitment made among leading Southeast Asian higher education institutions to share academic expertise and resources. SEARCA currently serves as the University Consortium secretariat, coordinating the programs of the network of strong universities in Southeast Asia, namely the Bogor Agricultural University and Universitas Gadjah Mada in Indonesia, Universiti Putra Malaysia, Kasetsart University in Thailand, and the University of the Philippines Los Baños. Tokyo Agricultural University in Japan, the University of British Columbia in Canada, and the Georg-August University of Goettingen (GAUG) in Germany are the associate members of the University Consortium.

[www.uc.searca.org](http://www.uc.searca.org)
The Bureau of Agricultural Research (BAR) was created in 1987 through Executive Order 116 to ensure that agricultural research is coordinated and undertaken for maximum utility to agriculture. It is mandated to tap farmers, farmers’ organizations, and research institutions, including state colleges and universities in the conduct of research for the use of the Department of Agriculture, particularly, the farmers and fisherfolk.

As the lead government agency for agriculture and fisheries R&D, the Bureau is committed to consolidate, strengthen, and develop the agriculture and fisheries R&D system for the purpose of improving its effectiveness and efficiency; ensuring customer satisfaction and sustained improvement through work excellence, teamwork, and networking; accountability; and innovation.

BAR envisions a stable and progressive future for the Filipinos through excellence in research and development—specifically to transform the agriculture and fishery industries into a technology-based enterprise that is focused on information development and management. To achieve this, BAR must be able to develop strategies, methods, and technologies that can make the sector competitive and efficient.

www.bar.gov.ph
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Arlene A. Nadres, KRU
Mark Vincent P. Aranas
Nicolas Palacpac, BIC
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