

# **SEARCA: Responding to challenges in agriculture and natural resource management in Southeast Asia**

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## **Abstract**

SEARCA has been at the forefront of Southeast Asian regional development since 1966 in its pursuit of strengthened institutional capacity in agricultural and rural development through graduate education, research, training, and knowledge exchange. In its efforts to be responsive to the evolving and current challenges in the region, the Center has reoriented its strategic focus to agricultural competitiveness and natural resource management with the desired outcomes of poverty reduction and food security. These foci are logical entry points for addressing the crosscutting nature of threats posed by invasive alien species. Though many of these species have been used beneficially, just as many may have been potentially devastating impacts. Research and fora will help development practitioners and policy makers, among others, develop strategies and craft policies that would enhance positive impacts and minimize adverse effects that may well extend beyond agriculture and the environment.

The need to accelerate development in Southeast Asia in the mid-1960s led the Southeast Asian Ministers of Education Organization (SEAMEO) to explore configurations of regional cooperation in education. They were convinced that achieving this meant strengthening the advances made in science and technology. Thus, the ministers decided to jointly develop regional projects in education, science, and culture for the mutual benefit of member countries, which now include Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam, and most recently, Timor Leste.

**Key words:** agriculture, natural resource management, agricultural competitiveness, graduate education, research, training, knowledge exchange, Southeast Asia, invasive alien species

The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) was established in 1966 as the first regional center of SEAMEO. Created mainly to help develop high-level manpower in agriculture in the region, it seeks to strengthen institutional capacity in agriculture and rural development through graduate education, research, training, and knowledge exchange, in its vision to be Southeast Asia's leader in the science and practice of agriculture and rural development. SEARCA is mandated to provide to the participating countries high-quality graduate education and training in agriculture; to promote, undertake, and coordinate research programs related specifically to the needs and problems of the Southeast Asian region; and to disseminate the findings of agricultural research and experimentation.

To ensure responsiveness to the challenges in and needs of the region, the Center operates on the basis of five-year plans. Each five-year plan is a product of consultation with experts, the University Consortium, research and training needs assessment of the Center and other institutions, and continuous environmental scanning. Development professionals and technical experts steeped in the dynamics in Southeast Asia subject it to rigorous evaluation.

SEARCA is now implementing its Eighth Five-Year Plan, which reoriented the Center's focus and programs to agricultural competitiveness and natural resource management, for the purpose of more directly contributing to poverty reduction and food security objectives of countries in the SEA region (Fig. 1). Policy and governance, development support systems, institutional capacity enhancement, sustainable land and water management, biodiversity conservation, and biotechnology are its focal concerns. Governance as it relates to delivery of agricultural support services, resource access, rural transformation, globalization and its impact on small farmers and similar stakeholders are priority areas. Food safety, intellectual property rights and management, and environmental leadership are likewise key concerns (Annual Report 2004-2005).

## **Challenges, issues & strategic focus**

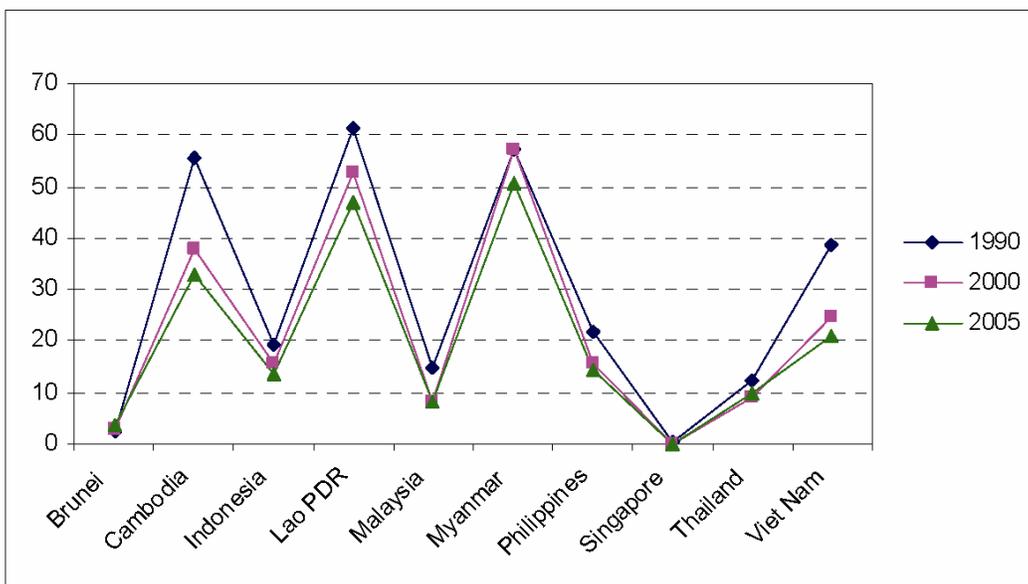
### **Agricultural competitiveness**

Agriculture plays a pivotal role in the region's quest for development; its important role in initiating and sustaining economic growth is recognized. While there have been gains in agricultural production and resurgence of economic growth in Asia in the recent years, share of agriculture in the gross domestic product of Southeast Asian countries have been generally declining (Fig. 2). This gains added

significance since about two-thirds of the region's poor live in rural areas and a huge proportion of these rural poor remain dependent on agriculture and agriculture-related industries for employment and income (Figs. 3 & 4).

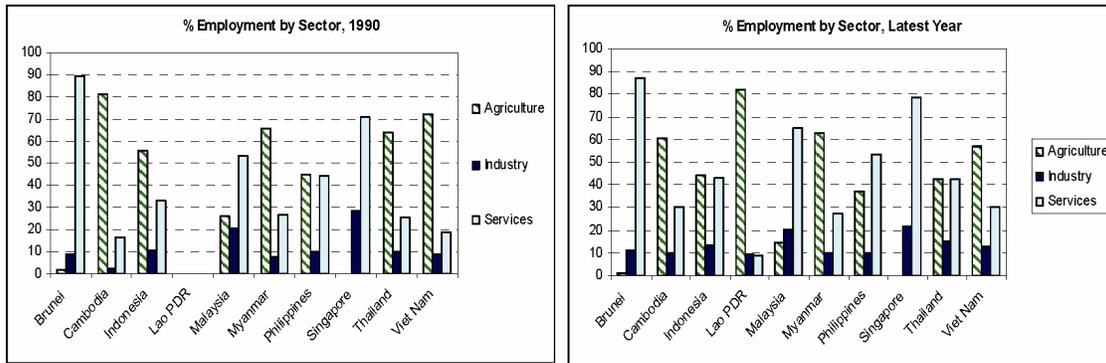


Fig. 1. Eighth Five-Year Plan mission areas, focal thrusts and development goals of SEARCA



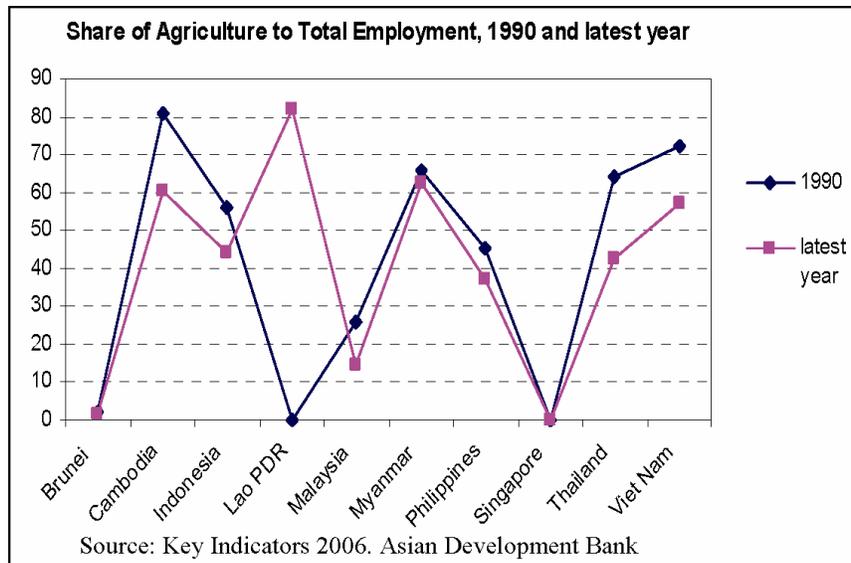
Source: Key Indicators 2006. Asian Development Bank

Fig. 2. %Share of Agriculture to GDP, 1990, 2000, 2005.



Source: Key Indicators 2006. Asian Development Bank

Fig. 3. % Employment by Sector, 1990 & Latest Year



Source: Key Indicators 2006. Asian Development Bank

Fig. 4. % Share of Agriculture to Total Employment, 1990 & Latest Year

Though agriculture has underpinned the expansion of the rural economy as well as industrial progress in Asia, there has been uneven progress; pockets of food insecurity persist. This situation may worsen in the face of the rapid changes taking place in Asia's mega-economies. These, obviously, have far reaching impacts, particularly for small developing and transition countries, as patterns and trends of production, consumption and trade evolve. These countries also need to face the challenges from increasing globalization and liberalization ushered by commitments made under the URA/WTO and other regional and bilateral free trade agreements (FTAs) or trading arrangements.

Sustainable agriculture and rural development under global liberalized agricultural trade require a national capacity to respond to challenges in order to

benefit from opportunities. It is imperative to ensure the integration of Asia's transition countries into the mainstream of economic development.

The development of a competitive agricultural sector is necessary to the overall socio-economic well-being of developing countries with predominantly rural populations (Citizens International). In the assessment of competitiveness changes in market share and exports are referred to. However, it is the quantity and quality of the country's productive resources coupled with government policies and national institutions that greatly influence its comparative advantage I international trade (Dohlman et al. 2003)

Agricultural competitiveness and food security are intrinsically linked to rural people and their livelihoods. Almost two-thirds of the regions poor live in the rural areas and are therefore highly vulnerable to becoming food insecure as economic access may be constrained. There is often inadequate physical and health and sanitation infrastructure in rural areas, which affect health outcomes and food utilization. The rural poor's lack of social and physical assets causes them to be highly vulnerable to external shocks, which in turn, affect food security. Improved livelihoods of rural people through education and other support programs would impact positively on food security (FAO 2006).

Research and experience show that to lift millions out of poverty and hunger, there is a need to enable the rural poor through policy, investment, and institutional reforms. This enabling environment allows rural growth benefits to be broadly based, thereby enhancing overall nutrition, human capital development, and productivity and economic growth in the medium- to long-term. SEARCA seeks to enable the member countries, most notably the transition SEA economies of Cambodia, Lao PDR, Myanmar, and Vietnam, to effectively address their development concerns in the face of the regional and global challenges of this decade, and even beyond.

### **Natural resource management**

The complex and interrelated issues of poverty, food insecurity, and a degraded and dwindling natural resource base continue to be major challenges in the region. Compounding this challenge is the persistent perception of a dichotomy between economic growth and ecological integrity. For most countries of Southeast Asia and elsewhere in the world, natural resources particularly biodiversity, forests, land and water have been a major support to economic, environmental and human well-being. The sustainability of agriculture addressing the twin goals of food security and poverty reduction largely depends on the integrity of the natural resource base.

Unsustainable management could easily disrupt the interrelated and interdependent relationship of agricultural and natural resource productivity.

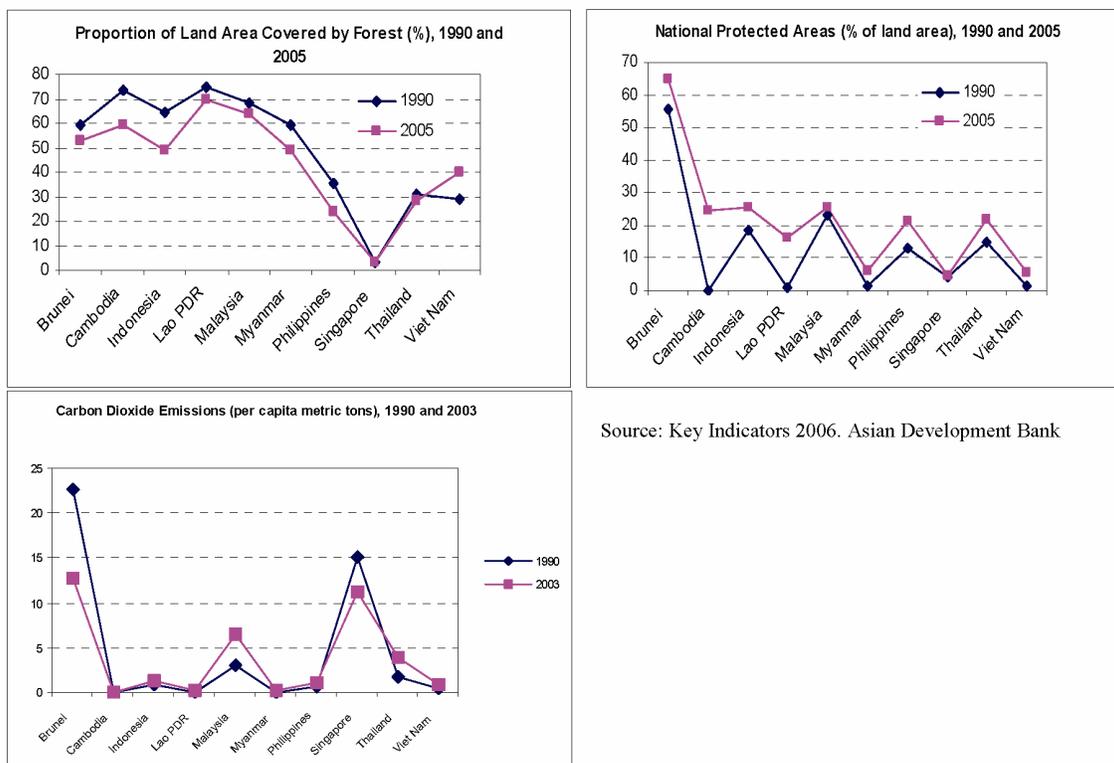
Biodiversity benefits people through its contribution to material welfare, livelihoods, food security, resiliency, social relations, health, and freedom of choices and actions (MA 2005). Forests have also been equally valuable in providing timber and non-timber products, opportunities for livelihood, and achieving water and food security, among other economic and ecosystem services. Sustainable water resources can be equated to food security, poverty eradication, human health and economic development for its value in irrigation of agricultural areas, providing safe drinking water, and supplying ample water for industrial and commercial uses. In much the same way, many other natural resources and systems provide a wide range of ecosystem services that contribute to human well-being, including livelihood opportunities.

However, much of the natural resources worldwide are under mounting threats that undermine its sustainability to provide livelihood opportunities, mitigate natural disasters and loss of lives and properties, and promote a healthy environment. Between 1990 and 2000, Southeast Asia lost a total of 2.3 Million ha of forests (FAO 2005). Along with this loss in forest cover, suitable habitats for wildlife are disappearing, water resources deteriorate, and farmlands together with lakes, coastal and marine ecosystems suffer from excessive pollution. These are mainly attributed to growing local populations and demands for products, increasing and improper uses of land, forests and other resources, and poor governance.

Fig. 5. shows trends on a number of environmental indicators in the region. There may have been small gains but vigilance has to be exercised to ensure that these are sustained.

Many factors drive change in natural resources and their management. The vigorously expanding economies in neighboring countries in South Asia and East Asia, international trade of timber and other natural resources in the region will likely intensify. However, there are those who believe that international trade triggers increase in demands for the exploitation of natural resources. As a result they advocate retention of trade restrictions to slow down depletion and promote sustainability of natural resources. In contrast, others believe that international trade can actually trigger improved efficiency and sustainability in natural resources utilization and they bat for removal of trade barriers. They further advocate that sustainability of natural resources can best be promoted by national policy actions rather than restricting international trade. To them, robust national policies on natural

resources sustainability will readily screen off any negative influences of international trade.



Source: Key Indicators 2006. Asian Development Bank

Fig. 5. Environment Indicators

## Programs and strategies

In pursuit of its mandate and to achieve its goals of poverty reduction and food security, the Center considers as its cornerstones graduate education, research and development, short-term training, and knowledge exchange. These, too, are in support of human resource development. SEARCA recognizes that human resource development remains an important key to Southeast Asia's agriculture and rural transformation. As the recent economic history of nations demonstrates, it is a determining factor for the inflow of foreign direct investments, technologies, and development ideas to many developing nations. It is also an important factor in determining the competitiveness of individual organizations, institutions, and societies.

**Graduate education** aims to help accelerate agricultural and rural development in Southeast Asia through the development of a highly trained human resource in agriculture and related sciences through the administration of graduate scholarships.

Moreover, in efforts to involve top agricultural institutions of learning in the region in its pursuit of human resource development, the Southeast Asian University Consortium for Graduate Education in Agriculture and Natural Resources, or University Consortium (UC) for short, was launched in 1989 through SEARCA's initiative. Today, the UC is an effective network linking eight strong universities in SEA, Canada, Australia, and Germany, exchanging information, facilities, and expertise,

**Research and development** aims to analyze the impacts of development thrusts and policy gaps, in support on continuing initiatives on agricultural and rural development. It conducts appropriate and relevant research activities on natural resource management and agricultural competitiveness. The Center's R7D efforts are aimed at taking an active role in shaping agricultural research and policy directions in the region.

**Short-term training** provides a continuing learning opportunity to mid- and top-level personnel who do not have the opportunity to undertake long-term graduate studies. The Center aims to imbue agricultural professionals and development practitioners in the region with technical and managerial knowledge and skills anchored on pragmatic regional and global perspectives as well as serve the enhancement needs of decision makers. It is expected that their critical mass can influence and create ripples of change in the rural, agriculture and environment sectors in Southeast Asia through the policies, research and development programs, and training initiatives of their respective countries and organizations.

Through Knowledge Exchange information and knowledge are made readily available and accessible to end users to advance agriculture and natural resource management. It transforms and disseminates information and knowledge from research results. Toward this end, it harnesses information and communication technologies to process and disseminate knowledge as well as coordinate knowledge and information networks that will provide venues for expert discussion on research results, and important issues and concerns in agricultural and rural development. It will play an active roles in the establishment of information networks and lead in the development and dissemination of relevant agricultural databases.

There are also opportunities through which SEARCA encourages the participation of others in the region in adding to the existing body of knowledge in the region on natural resource management, agriculture, and related fields to contribute to agriculture and rural development towards poverty reduction and food security. This is a two pronged approach which addresses the aforementioned while at the same time also furthers human resource development. Among these program

enhancing activities and opportunities are the Seed Fund for Research and Training (SFRT), Visiting Research Fellow (VRF), PhD Research Scholarship, and Travel Grants.

SEARCA recognizes that Southeast Asia has numerous promising individuals whose desire to contribute to the region's development through research is hindered by lack of funds. To address this concern, SEARCA has dedicated funds known as the SFRT. Each grant has a maximum fund support of US\$15, 000. Projects proposed by Southeast Asian nationals within the Center's priority thrusts is eligible provided that it is innovative and is accompanied by an appropriate plan for developing it into a large-scale research or training program and has a strong potential for generating significant long-term funding support from donors.

The VRF is open to all reputable researchers within and outside the region who are doing research along the thrusts of SEARCA. The objective is to improve the technical expertise and managerial skills of agriculture and development practitioners who can assist in improving agriculture and rural development.

The PhD Research Scholarship Program provides financial support to qualified PhD students whose researchers are relevant to the priority thrusts of the Center. The amount of scholarship is up to a maximum of US\$8, 400 per grantee. The program aims to provide students the opportunity to utilize facilities at SEARCA and its network of universities for research and work with SEARCA's R&D personnel, and produce quality research papers for publication.

The Travel Grant aims to provide opportunities to qualified Southeast Asian nationals to present papers and participate in scientific fora, interact with other scientists and scholars on developments in their respective disciplines, and promote dissemination of scientific knowledge vital to agriculture and rural development.

There are other modalities through which SEARCA pursues its mandate. These, too, are evolving and undergoing continuous refinement.

SEARCA strives to be relevant in its role as development catalyst. However, given the dwindling resources experienced by many development institutions within and beyond the region, this is a role that is constantly being challenged. The Center, as a way of optimizing resources, continues to forge and strengthen linkages with current and potential partner institutions. This is done with the end in view of complementing efforts in the region to promote agricultural competitiveness and sustainable natural resource management.

## **Rising to the challenge of invasive alien species**

Invasive alien species (IAS) are plants, animals or micro-organisms that are not native to a specific ecosystem and whose introduction threatens biodiversity, food security, health or economic development (McNeely et al. in Rangi 200 ). While this subject may not be alien to sections of the science community, this is something new to a bigger part of the general public.

SEARCA, together with a partner institution, had attempted to develop a database on weeds in Southeast Asia a few years back. However, plans fell through. It has done limited work directly on IAS thus far. This may be the perfect opportunity to widen its involvement.

Discussions on IAS have often been in relation to the environment, particularly their impact on biodiversity. A conference-workshop on IAS that was organized in the Philippines on 26-28 July 2006 with the theme “Invasive Alien Species in the Philippines: Status, Challenges, and Directions” primarily looked at the pathways of introduction and focused on their impacts on biodiversity. It also gave a rundown of existing policies that directly dealt with IAS. It was an effort at stocktaking of the nature and extent of IAS in the country. It did a good job of raising awareness, appreciation, and concern on IAS and their impacts on aquatic and terrestrial environments. It ended with initial steps at formulating a draft national strategic framework and action plan on these species. This strategic framework and action plan is indeed a step in the right direction.

However, in most developing countries where availability of sufficient, safe and nutritious food for its population is the overriding concern, environmental issues are not the highest priority of government. The link between livelihoods and biodiversity are still poorly understood (Brackett et al. in Rangi). Consequently, the cross-cutting nature of the potential harm posed by IAS is largely unrecognized and unappreciated. In fact, the poor understanding of IAS in developing countries, and the subsequent limited capacity to deal with them, is a major constraint.

How can we, therefore, highlight this concern to inform stakeholders and make policy makers sit up and take note?

We can choose to highlight agriculture and food security as entry points, in addition to environment and biodiversity. IAS and impacts on agriculture and agricultural competitiveness is fertile ground for study.

## Research areas

Research activities can examine losses in potential agricultural revenues and actually quantify them for greater impact, on policy makers in particular. Problems caused by invasive plant species run in the billions in the global economy annually, primarily from lost grazing grounds and decreased crop productivity due to non-native weeds, as millions have been lost in poultry and livestock with the outbreak of diseases. Simulation studies can be conducted on economy-wide effects of outbreaks in a country, as a study commissioned by SEARCA on the economy-wide effects of an avian flu outbreak in the Philippines.

Additionally, if the environmental costs in terms of lost species and ecosystem services are likewise accounted for, costs would even be higher.

Furthermore, the introduction and spread of IAS may have trade implications. A comparative advantage in exports may be lost when unaffected countries may ban importation of goods from affected countries or impose costly precautionary measures (Pimentel *et al.* 1999). Simulation studies can likewise be undertaken on impacts of changes in trade policies or various forms of government intervention where affected countries are trading partners.

Revisiting policies and the institutions charged with their implementation, particularly where pathways to introduction are concerned, is another worthwhile activity. Among other things, this would mean ensuring that agricultural infestations are not met by importation of more alien species in efforts at biological control. Examples, among many, are when the Bureau of Plant Industry, in the 1970s and 80s, brought to the country the fungus *Metarrhizium anisopliae* to control the rice black bug, or when it imported the weevil *Cyrtobagous salviniae* to control *Salvinia molesta* (Cuaterno 2006). Unfortunately, there has been no monitoring of these imported species and, to date, there is no official information on their status.

The aforementioned examples also highlight the conflicts that need to be resolved where IAS are concerned. Some of them have been and continue to be beneficial. With others, the detrimental effects are just becoming evident. What are the management and policy options?

## Capacity building

As mentioned earlier, the lack of awareness on IAS and the equally limited capacity to address the issue are major stumbling blocks. SEARCA can start with modest steps in this area by building on its existing programs.

One of the short-term training programs of the Center is the Natural Resource Management in a Globalizing Asia. This program implements weeklong modules targeting mid- to top-level executives of development and environmental institutions and government agencies. These modules include resource and environmental valuation, governance of biodiversity intellectual property, natural resource use negotiation for rural development, participatory research and communication in natural resource management. A module can be developed on the multifaceted conundrum that is IAS.

SEARCA has also organized the SEARCA Policy Roundtable Series on Building Capacities to Improve Agriculture and its Competitiveness in Transition Southeast Asia (Cambodia, Lao PDR, Myanmar, Vietnam [CLMV]). Policymakers and rural development practitioners from CLMV as well as from China and the Philippines have met to exchange and discuss collaborative strategies and policy instruments to combat poverty and food insecurity vis-à-vis the increasing globalization, agricultural trade liberalization, and other emerging challenges facing the agriculture and rural sectors. They have reached a consensus on the need for capacity building to strengthen human resources for agricultural competitiveness through technical cooperation among developing countries (TCDC) in CLMV. The fourth of the series, to be held in Vietnam in December, will focus on Food Safety and Sanitary and Phytosanitary Measures. This may be another opportunity for inclusion of the IAS in the discussion and into the consciousness of the participants.

The subject of IAS can also be discussed with the current and future batch of SEARCA scholars who may opt to research on an aspect of it for their thesis or dissertation. This will add to the current body of knowledge, which may open up other facets of the subject matter for research.

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