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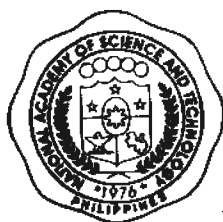
**ABSTRACTS of PAPERS  
Presented during the  
27<sup>th</sup> NAST Annual Scientific Meeting**

*Philippine Agriculture 2020: A Strategy for  
Poverty Alleviation, Food Security, Global  
Competitiveness, Sustainability, Justice and Peace*

13-14 July 2005

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## **27<sup>th</sup> ANNUAL SCIENTIFIC MEETING**

### **Philippine Agriculture 2020: A Strategy for Poverty Alleviation, Food Security, Global Competitiveness, Sustainability, Justice and Peace**

27<sup>th</sup> ASM: 13-14 July 2005; The Manila Hotel

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# **27<sup>th</sup> ANNUAL SCIENTIFIC MEETING**

## **PHILIPPINE AGRICULTURE 2020**

**13-14 July 2005, Manila Hotel**

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## **WELCOME MESSAGE**

**Academician Perla D. Santos Ocampo**  
President, National Academy of Science and Technology Philippines

Undeniably, science has made a striking contribution to the improvement of human welfare especially in the past century during which dramatic advances have occurred in all disciplines, spectacular changes have led to development, which have transformed the status of many countries to more advanced stages with consequent reduction in inequities and the acceleration of human well-being.

The Academy was created in 1976 and is mandated to advise the nation and the people on national issues related to science and technology, to recognize outstanding achievements in science and technology, and engage in projects and programs to promote a science culture and environment and scientific productivity. The Academy is composed of members of the scientific community of the country called Academicians. Currently 10 of our Academicians are also National Scientists, our precious national treasures. At present, there are 51 Academicians in six divisions: Agricultural, Biological, Mathematical, Chemical and Physical, Engineering Sciences and Technology, Health; and Social Sciences.

Annually, in keeping with its mission and vision, NAST identifies mega-issues of great concern to society. Thus, last year, among the issues discussed extensively and dealt with were population, rice productivity and sufficiency, biosafety, bioprospecting, microbial genetics, mathematics and science education, the status of medical schools, hospital waste management, and enhancement of the role of the scientific community and bearers of the science culture. The Academy was also involved in the crafting of the water policy, urbanization and land conversion and industrialization, applications and ethics relative to the human genome, the health of older persons, agricultural biotechnology, biodiversity, a technology roadmap for the semi-conductor and electronics industry, and recently coconut oil for better health.

The Annual Scientific Meeting of the NAST is held on the second Wednesday and Thursday of July, come rain or shine, come typhoon or floods. This year, the Academy, ever faithful to its vision to attain a progressive Philippines anchored on science is holding its 27<sup>th</sup> Annual Scientific Meeting focused on the theme "Philippine Agriculture 2020: A Strategy for, Food Security, Global Competitiveness, and Sustainability". I congratulate the organizers of this meeting, our Agricultural Sciences Division led by Acd. Teodulo M. Topacio Jr., the co-chairman, Acd. Emil Q. Javier and a huge number of committees that worked hard to make this meeting a successful as it promises to be.

Then of course, there is the writing group of PA 2020 that has worked so hard and burned the midnight oil in order to produce a remarkable document and extensive visionary plan entitled similar to our theme with the addition of goals of poverty alleviation, justice and peace in its title. This will serve as the main resource material for the next two days and even beyond especially for our panelists and distinguished speakers whom I would like to thank even now. But by no means is the work of this group finished. The sacrifice, the labors will still have to continue for there still much work to be done.

The goal is to present PA 2020 to the President and the Cabinet by end of this year together with its inputs from you during the next two days from democratic consultations and afterwards for the refinements and revisions.

We thank all those who are helping us in the production of this remarkable documentation for their dedication and patriotism. It is our passionate hope of course that the annual scientific meeting keynoted by the Secretary of the Department of Agriculture, Arthur C. Yap. He will be properly introduced later by our very own Secretary of the Department of Science and Technology (DOST), Sec. Estrella F. Alabastro. And we hope that this meeting will lead to a relevant and feasible roadmap for agriculture and in uplifting the lives of the people through science and technology. We hope the discussion will bring about a positive impact not only on the many stakeholders but especially on our policymakers and leaders with just a decade to go until the deadline for the Millennium Development Goals, that's 2015. It is imperative that the political will and resources be fully harnessed to ensure the attainment of the key targets of the Millennium Development Goals.

On behalf of the Academy, therefore, let me extend my appreciation to our partners and co-workers. I like to mention a few of them—Sen. Ramon

Magsaysay, chair of the Committee on Science and Technology of the Senate, the DOST, especially the two councils, the Philippine Council for Agriculture, Forestry and Natural Resources and Development and the Philippine Council for Aquatic and Marine Research and Development, the Department of Agriculture, the Department of Environment and Natural Resources and all sectors, agencies, and institutions concerned, for all the support given to the NAST to ensure the success of this year's Annual Scientific Meeting. Definitely, we should all work together to bring the benefits of science to our people and to our country. My warmest welcome once again. Thank you very much for being here with us.



## **PHILIPPINE AGRICULTURE 2020 EXECUTIVE SUMMARY**

### **1.0. INTRODUCTION**

#### **1.1. Concept and Methodology**

The PA 2020 long-term plan is the first attempt to integrate agriculture (crops, livestock, fisheries), environment and natural resources (forestry products) sectors, and social systems using the millennium ecosystems assessment framework of the United Nations (UN). The planning exercise recognizes the importance of a science-based development strategy, with a time frame not constrained by the traditional short to medium-term planning and autonomous, but cognizant of, political and bureaucratic considerations.

PA 2020 builds upon the commodity roadmaps developed by the DA as well as on the department strategic plans of DA, DENR, DOST and DLR, respectively. It drew heavily on the agency plans of key units like PhilRice, PCA, Philsurin, FIDA, and the sectoral Councils of DOST. It took into account the major thrusts and projections of the MTPDP (2004-2010).

PA 2020 is an initiative of the Agricultural Sciences Division (ASD) of the National Academy of Science and Technology in the exercise of NAST's advisory function. Headed by Dr. Teodulo Topacio, Chair, ASD and Dr. Emil Q. Javier, Chair, Biological Sciences Division, the Division acknowledges the leadership of PCARRD, PCAMRD, DA-BAR and DENR-ERDB in agricultural research planning, coordination, funding, monitoring and evaluation. Key agencies like LDC, PHILSURIN, PhilRice, the Philippine Coconut Authority and several academic units from University of the Philippines Los Baños and University of the Philippines Diliman bought into the project by sharing their time and expertise. The team received strong support from the heads of three departments most involved in agriculture: the Secretaries of the Department of Agriculture (Luis Lorenzo and Arthur Yap); the Department of the Environment and Natural Resources (Michael Defensor); and the Department of Science and Technology (Estrella Alabastro).

Philippine Agriculture 2020 envisions robust and vibrant agricultural and natural resources (NR) production systems and ecosystem services that improve and sustain well-being in the Philippines. This vision informs the logical framework (logframe) and identifies a set of development goals, objectives, and targets of the whole sector and 14 specific industry cluster levels (Table 1).

Table 1. Logical Framework of the Philippine Agriculture 2020.

Vision	Goal	Objectives	Tar-gets	Acti-vities	OVI's
<b>Robust and vibrant agricultural and natural resources (NR) production systems and ecosystem services that improve and sustain human well-being in the Philippines</b>	<b>Improve Human Well-being through:</b>	<b>Human Well-Being (HWB): By 2020,</b>	<b>STILL TO BE WORKED OUT AT THE INDUSTRY CLUSTER LEVELS</b>		
	Decrease in poverty	Reduce poverty by 50%			
	Enhance food security Enhance fiber security Enhance energy security	Increase domestic food, fiber, biofuel production by 10%, and agricultural GVA to 30% of GDP			
	Improved agro-industrial sector competitiveness	Enhance competitiveness on agricultural and NR products by a factor of 0.50			
	Improved sustainability of ecosystem services	Reduce environmental threats to HWB by a factor of 0.50			
	Better justice and peace				
	<b>Improve Ecosystem Services through:</b>	<b>Ecosystem services: By 2020,</b>			
	Better agriculture production system	Expand agricultural production to at least 50% of public lands and municipal waters			
	Better ENR management system	Expand private investments on primary production in public domain by at least 50%			
	More effective governance	Expand co-management and co-investment in agricultural and NR production by a factor of 0.50			
		Integrate production systems in private and public domains by a factor of 0.50			



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	More effective governance	Expand co-management and co-investment in agricultural and NR production by a factor of 0.50			
		Integrate production systems in private and public domains by a factor of 0.50			

## **1.2. Millennium Ecosystem Assessment Framework<sup>1</sup>**

The Millennium Ecosystem Assessment (MA) shows a strong linkage between ecosystems and human well-being, in particular, the “ecosystem services.” These services are the benefits people obtain from ecosystems. The conceptual framework posits that people are integral parts of ecosystems and that a dynamic interaction exists between them and other parts of ecosystems, with the changing human condition driving, both directly and indirectly, changes in the ecosystems which in turn cause changes in human well-being. At the same time, social, economic, and cultural factors unrelated to ecosystems may alter the human condition, and many natural forces influence ecosystems. Although the MA emphasizes the linkages between ecosystems and human well-being, it recognizes that the actions of people that influence ecosystems result not just from concern about human well-being but also from considerations of the intrinsic value of species and ecosystems<sup>2</sup> (Figure 1).

## **1.3. Goals**

Given the global changes that impinge on Philippine agricultural and natural resource ecosystems, the PA 2020 long-term plan visualizes the dynamic interactions of the agricultural and natural resources ecosystems, and projects the likely impact on the well-being and security of the Filipino, in terms of five interrelated development goals: poverty reduction, food security, competitiveness, sustainability, and justice and peace<sup>3</sup>.

Using the ecosystems conceptual framework, national human well-being is determined by the changes in at least three systems: the agricultural systems, environment and natural resources systems, and the social systems (Figure 2).

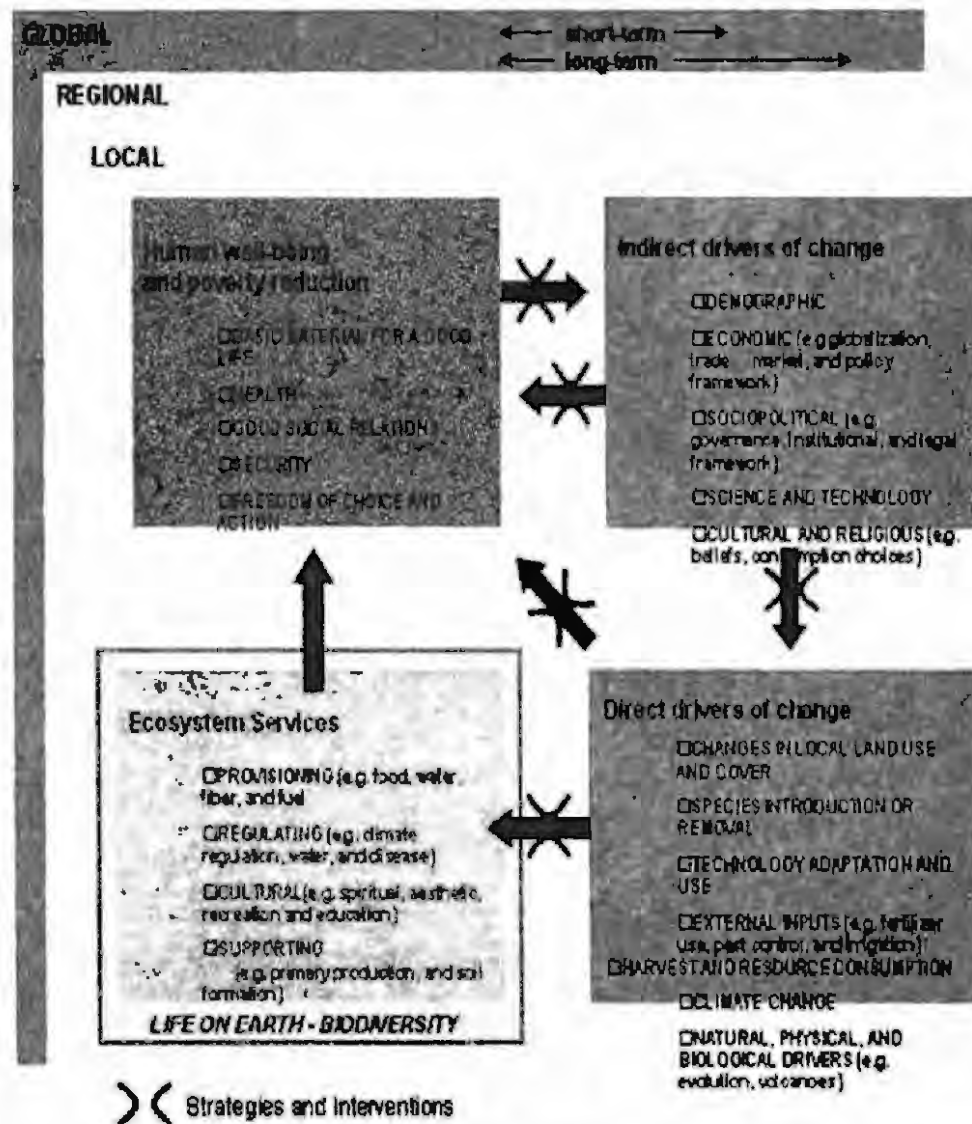
The agricultural systems are in turn driven, among others, by changes in climate, soil and water, technology shifters and techniques and certain tenurial arrangements in both private and public domains. In the same manner, the performance of the environment and natural resource systems are determined by environmental risks/quality and threats, tenure systems and technology and techniques. Finally, the drivers of the social systems performance are population numbers and quality, and governance systems.

---

<sup>1</sup> Condensed from Millennium Ecosystem Assessment (March 2005).

<sup>2</sup> Intrinsic value is the value of something in and for itself, irrespective of its utility for someone else

<sup>3</sup> These goals are broadly congruent with the seven principles of the Agriculture and Fisheries Modernization Act (AFMA) of 1997. These are poverty alleviation and social equity, food security, rational use of resources, global competitiveness, sustainable development, people empowerment, and protection from unfair trade practices.



Source: Millenium Ecosystem Assessment 2005

Figure 1. Conceptual framework of assessing ecosystems linkage with human well-being.

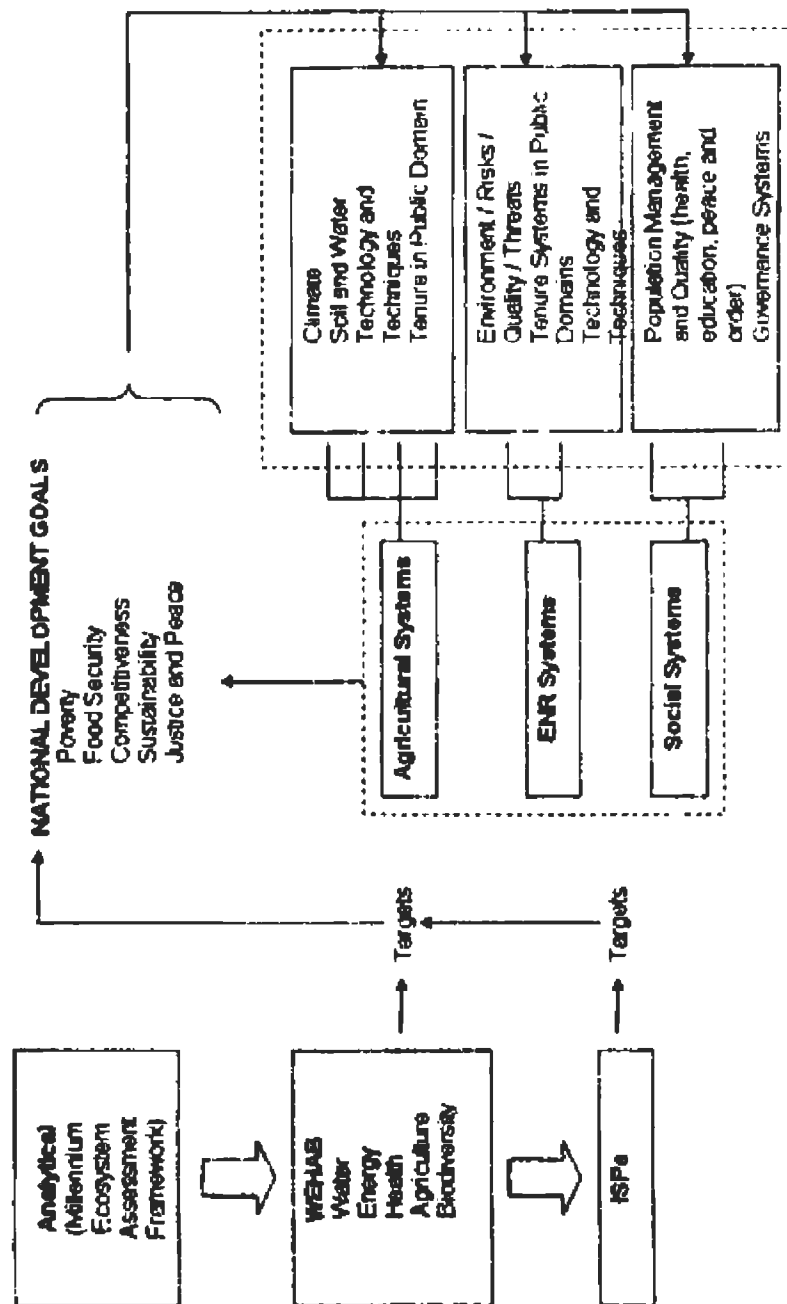


Figure 2. Conceptual development framework of Philippine Agriculture 2020.

The ecosystems conceptual framework of the MA (left inside of Figure 2) is inputted into the PA 2020 strategic framework as an analytic tool in attaining the Millennium Development Goals (MDGs). By focusing on the water, energy, health, agriculture and biodiversity (WEHAB), integrated systems targets can be made to attain the five national development goals.

## **2.0. THE PHILOSOPHY: AGRICULTURE AS A WAY OF LIFE**

The philosophy that Philippine Agriculture 2020 used in envisioning the future is a holistic view of agriculture, cognizant that its role as a source of income is only a part of its more all-encompassing character as a way of life.

### **2.1. Three Pillars of PA 2020**

PA 2020 rests on three pillars, namely: organizing and managing agriculture as a business; attacking poverty through asset reform; and nurturing the values of nature and community in our people.

#### **2.1.1. Organizing and Managing Agriculture as a Business**

To enhance productivity and efficiency, Philippine agriculture must be organized as a business. Under a regime of liberalized trade, and given the smallness of landholdings, the initial efforts should focus on: a) the farmer-focused, market-driven agriculture that attempts to transform traditional small farmers into entrepreneurs; b) the agribusiness systems within the context of socio-economic policy environment, improving the efficiency of the supply chain and enhancing efficiencies within the subsystems; c) product and market transformation to simultaneously capture the dynamic changes in domestic and global markets, from low-value to higher-value processed products; and d) industry clustering to internalize the linkages among industries within the sector and in the economy. The industry cluster model aggregatively incorporates the three other modalities. It is focused on sub-sectoral productivity, competitiveness and sustainability.

Agriculture as a business must encompass the supply chain of inputs, production, post-harvest, distribution and foreign trade. The strategy must be informed by our resources and the needs of our people, as well as our global competitiveness as importers and exporters. It must be oriented to the market, and therefore must be accompanied by periodic and accurate reading of supply and demand. The lead role would be given to the private sector but government, civil society and the farming communities must join in making investments in the countryside attractive.

#### **2.1.2. Asset Reform as a Key Instrument for Reducing Poverty**

Asset reform involves transferring property and/or usufruct rights to assets to the poor as a key instrument for attacking poverty and in the same breath to stimulate increased investments among rights holders on making the assets productive.

The prominence of poverty alleviation as a strategic policy concern in the agricultural sector will likely rise to compete (even more than at present) with food security and competitiveness as goals of the sector.

In the lowlands, it is imperative that agrarian reform be accelerated and completed and agrarian reform communities organized to become viable social and economic entities. This requires husbanding the solidarity of neighborhoods and cooperatives in co-management of certain crucial infrastructures like irrigation facilities; nurturing the entrepreneurial spirit of the forward-looking among them, and encouraging cooperatives, people's organizations and NGOs as well as universities, local governments and the private sector to energize the agricultural extension system for these newly emancipated farmers. It also challenges Filipino firms to invest in the rural areas and invent viable partnerships with farming households and cooperatives for the production and use of hybrid seeds, integrated pest management, post-harvest facilities, the marketing and distribution of their produce and so on.

For the uplands, PA 2020 suggests a radical change of policy regarding production forests most of which are now covered by community-based forest management agreements. The more entrepreneurial beneficiaries in many CBFMAs have begun planting forest trees in their individual homesteads. Our recommendation is to build upon the momentum of this innovation in social forestry by granting them private titles to encourage more forest occupants to invest their labor and resources, to planting trees and related agro-forestry activities in the forestlands they tend. The phased release of the CBFMA lands (now covering 5.71 million hectares) will be coordinated with incentives to private corporations, cooperatives and even LGUs to put up processing plants to absorb the produce of the incipient tree estates. Priority will be given to the CBFMAs which are complying with the stewardship contracts.

At least ten percent of the Philippines' 26 million ha of coastal waters are suitable for mariculture. Only 59,000 ha of these suitable shallow coastal waters are farmed for seaweeds, finfish, abalone, and sea cucumbers. Yet our coastal dwellers are among the poorest of the poor in our country. The farming of 255,000 ha of shallow coastal waters would provide viable livelihood to a million households throughout the country, but would have special resonance in Muslim coastal communities in Mindanao. This would then be not only an economic imperative but a social justice one as well.

### **2.1.3. Nurture of Nature and Community Values**

The values of community and respect to the environment that agriculture as a way of life engenders are necessary underpinnings not only for agricultural reform but for the strengthening and complementation of the rural and urban halves of the country as well.

Present awakening to the values of nature and community augur well for their nurture that PA 2020 submits as its third pillar. One of the programs that

can exemplify it is genuine eco-tourism which should be run as a business, but should not only be a business. Local governments may use it as a starting point for getting the community to focus on their sources of pride, and how they themselves live in harmony with nature. They may see it as a means to exercise the vaunted Filipino hospitality without feeling inferior or becoming subservient to the outsiders with whom they share their portion of nature's bounty.

Solidarity is a value engendered in agriculture as a way of life, but is not confined only to those living in the farms. The work of cooperatives, people's organizations and NGOs hews us closer to the ideal of broad-based participatory democracy that is the ultimate underpinning of equity, sustainability, and justice and peace. A major contribution of civil society, of direct concern to Philippine Agriculture 2020, is its effectiveness as an instrument in safeguarding the use of common resources, as may be shown in the performance of NGOs and POs in community-based natural resource management (CBNRM) and coastal resource management (CBCRM). In these ventures, they have fostered either indirectly (if NGOs intermediating between the people and the state) or directly (as members of people's organizations and cooperatives), stewardship in the use of resources, respect for the rights of indigenous peoples and the other rural poor communities, and participation in the conservation of the environment and other public ideals.

## **2.2. Enabling Strategies**

Three enabling strategies will buttress the three pillars of PA 2020: technology development, investments, and governance reforms. Technology development is the "efficiency driver" of the supply chain in the provision of agricultural goods and services. As an enabling strategy, production technology innovations will reduce per unit cost of production resulting in enhanced efficiency in the agribusiness system. Green technologies on the other hand will reinforce the integrity of ecosystems and guarantee their sustainability over time.

The modernization of agriculture calls for substantial investments in 1) infrastructure such as farm-to-market roads, irrigation and drainage, postharvest systems and storage facilities, information, communications and transportation infrastructure, 2) in human capital, and 3) in institutions, particularly those engaged in R&D and extension. To optimize our productivity and competitiveness, it is imperative that these investments, both public and private, be in place.

Finally, under the Philippine context, governance reforms, the third enabling strategy, is the "binding force." First, the public sector plays a major role in

initiating development interventions. Second, majority of the institutions that implement the enabling strategies are public in character, and third, good governance implies broad-based participation of stakeholders, which is a requisite to sustainable development.

There are two basic characteristics of the three enabling strategies of PA 2020 under Philippine conditions. The first and foremost is the public nature of the technology development, investment and governance reforms. At present, most strategic activities of these three are public sector-driven, generating “public goods,” especially those related to the enhancement of agro-ecological systems that produce goods and services. The production of public goods, whether in technology, investment and governance reforms, is a necessary, but not sufficient condition, in optimizing the benefits of the agro-ecological assets. To complete the optimization, private sector investment in the agribusiness system must take place to ensure economic sustainability. A final dimension of the enabling strategies is the need for conscious public investment in resource recovery of the assets. This strategy is consistent with the MA framework.

### **2.2.1. Technological Development Directions**

Following the agro-industrial cluster framework, technology development within the next fifteen years and even beyond should anticipate the technology needs of the different industrial clusters to make Philippine agriculture more efficient in the use of scarce resources, more competitive in the global market and thereby more profitable to producers, while assuring the sustainability of resources for future generations. The direction of technology development is organized along the supply chain components of primary production, distribution system, processing or value-adding and cross-cutting concerns in agricultural mechanization and water use, biotechnology, as well as social science and policy research.

#### **2.2.1.1. Primary Production Technology Support**

Remarkable yield improvements are achievable with the widespread deployment of crop hybrids. Breeding for tolerance to biological and environmental stresses, particularly as a consequence of climate change will continue to be major plant improvement objectives. In addition, improvement of quality and nutritive value (bio-fortification), particularly, of certain essential minerals and vitamins to combat hidden hunger, as the dietary requirements for protein, carbohydrates and fats are progressively met, will require increasing investments.

Integrated pest management has drastically reduced the application of harmful pesticides. The ecology of major pests and diseases, the identification,



multiplication and deployment of bio-control agents, the use of sex attractants, and judicious stacking and deployment of resistance genes will likewise require more attention.

With declining per capita availability of land, the opportunity of increasing production and income from the same piece of land by way of intercropping and relay cropping will need to be more aggressively explored. Earlier research on short maturity crops, tolerance to shading, and higher planting density need to be revisited.

Integrated soil fertility management, coupled with the development of new fertilizer materials like slow-release/controlled release fertilizer is a rich area for future research. Dependence on inorganic fertilizer can be lessened through this approach with positive implications on environmental health and farm income. Innovative approaches on soil erosion control, sloping land management technology, green mulching, cover crops, precise fertilizer application and management and bio-organic farming, among others, will go a long way in our attempt to achieve sustainability and improve the profitability of the farm enterprise.

Livestock and poultry have been the fastest growing sub-sectors in Philippine agriculture in recent years. Future researches should focus on reduction of production cost, improvement in quality and the development and promotion of niche products (e.g. organically produced meat, duck eggs and meat, native chicken, halal food, etc.). Moreover, there is a need to develop better structures and strategies for solid waste management while ensuring high animal performance and environmental safety. In the case of ruminants, use of improved breeds and the accompanying production technologies should be given emphasis as well as improvement in pasture carrying capacity.

On animal health, there is a need for the country to persevere in its efforts to achieve the status of being FMD-free and to make sure we are spared from emerging livestock diseases such as BSE and avian influenza. Thus, efforts should be focused on sustaining/enhancing the quarantine procedures and surveillance of these diseases. It is also necessary to support the development of diagnostic/detection kits.

Research activities in forestry should provide the necessary technology support to the establishment of high quality wood and non-timber plantations and their efficient/optimal processing. There is also a need to initiate the development of R&D programs on log production of lesser known species from the second growth or residual forest. Research activities designed to minimize wasteful raw material utilization, and the use of these wastes into useful products like fiberboards, activated carbon materials, etc. are also

necessary. The development of GIS that provides data (i.e. climate, soil, physiography, elevation aspect, land use, etc) and the development and management of decision support systems for forestry are also important.

To promote sustainable forest management, the following approaches need to be undertaken: the delineation of forest boundaries and complete demarcation of forest line on the ground; the identification and allocation or release of forestlands appropriate for the establishment of industrial tree plantations, that would make the country, in due time, self-sufficient in timber and do away with costly importation; the creation of an investment climate that would attract local and foreign capital in the rehabilitation, development and management of the country's forest resources and biological diversity, for their various products and services, including ecotourism and climate change mitigation and the promotion of synergistic efforts through mobilization of regional and international cooperation/collaboration on sustainable forest management.

In fisheries, research directed at the primary production system should focus on the cage culture of high-value fishes (e.g. grouper, seabass, pompano) as well as disease management of prawns. Hatchery and nursery techniques will have to be refined to produce high quality seed stocks. Intensive research and development is also needed for lowering the cost of producing cultured stocks particularly by developing cost-effective feeds from locally produced substitutes for fishmeal and soybean meal. In addition, there is a need to further develop and improve hatchery/nursery and mariculture technologies for high-value invertebrates (i.e. abalone and sea cucumbers). Other future research areas should include diversification of seaweed species and culture, and genetic improvement for better growth and disease resistance.

#### **2.2.1.2. Technology Support for Processing and Distribution Systems**

Future research effort should be directed towards expanding value-added activities at the farm and village levels. Important areas for research would include the development of food processing technologies compatible with small-holder operations, innovative packaging and design, and food products standards, safety and quality assurance.

Other research activities should help address problems of distribution systems such as inefficiency, high postharvest losses, too many intermediaries and high marketing cost exacerbated by poor roads and underdeveloped ports. Development and use of cold chain systems, better packaging materials and technologies designed to minimize deterioration during transit and storage (e.g. refrigeration, modified or controlled atmosphere/environment, etc.) and improvement of marketing schemes are imperatives in this area.

by a cooperative or a private entrepreneur which is networked to supply chains within the Philippines and globally.

#### **2.2.3.2 Institutional Reforms**

Effective public governance implies the presence of strong public institutions that can implement reforms. The Agricultural Commission of the Congress of the Philippines has made a thorough study of the agriculture sector and has made specific recommendations for its reform. Some of these have been incorporated into the AFMA. PA 2020's recommendations in this regard complement the reforms started by AFMA.

**Reform of the Department of Agriculture.** The Department of Agriculture is the national planning, coordinating and monitoring and evaluating body for agriculture and fisheries programs. As such it is the government agency in charge of the development, promotion and regulation of all agricultural policies and programs in the country. At present, it is principally involved with primary production, and its attached agencies are devoted to single commodities.

The major reforms needed in the Department of Agriculture are the following:

1. To develop agriculture as a business, the Department must undergo a paradigm shift from its historical emphasis on commodities and primary production. It must reorient its institutional structures and operations to agro-industrial clusters and pay increased attention to the efficient production of inputs, and post-harvest, storage, processing, packaging, marketing and distribution aspects of the supply chain. These can be achieved through (a) internal rationalization; and (b) more effective partnership and collaboration with other agencies like the Department of Trade and Industry, the Department of Land Reform, and local government units as well as with the private sector and civil society organizations.

2. Its regulatory agencies must focus on improvement of competition. Their rules and regulations should be simplified to minimize discretion of regulators and to improve transparency through clear rule-based procedures.

3. Transparency and accountability should be the hallmark of a reformed Department of Agriculture. While not singled out as an extremely graft-ridden department, high profile cases have periodically put it under scrutiny. Reports by the Commission on Audit and investigations by Congressional committees show malpractices and questionable decisions in the use of Government resources.

4. The completion of agrarian reform as land transfer is expected by 2013. Thereafter, there would be no need for separate departments of agriculture and land reform and the two should be merged. There would then be a single department developing the business of agriculture as a way of life, with units for forecasting agriculture product futures, product standards and development of supply chains (in coordination with Department of Trade and Industry), provision of infrastructure support (in coordination with Department of Public Works and Highways), and agriculture research and extension [in coordination with the Department of Science and Technology and the National Agriculture Research System (NARS)].

**Reform of the Department of Environment and Natural Resources.** The Department needs to be restructured to take account of its new responsibilities in asset reform in the uplands, its continuing functions in implementing community-based forest management (CBFM) projects, and the devolution regime started in 1991. The rationalization of human resource and fund allocation must show these altered emphases.

#### **2.2.3.3. Integrated Research and Development and Extension System**

The PA 2020 fully supports the MTPDP provision which pushes for the full implementation of the AFMA provision on the consolidation and rationalization of the ANR RDE system to improve productivity, competitiveness, environment-friendliness, effectivity, and responsiveness to the sectors' needs. To facilitate this efficiency and reform objective, the disparate component agencies and networks of the RDE system (DA, DENR, and DOST) should be harmonized.

The agricultural extension function has been weakened, partially due to lack of synergy between the National Agricultural Research System and the National Agricultural Extension System, and partially as a consequence of the devolution of the function to local government units. Government should develop priorities and funding for research particularly relative to biotechnology, plant breeding, etc. Among the incentives for scientists would be the protection and safeguarding of their intellectual property rights over their discoveries and innovations. Applied research from the demonstration end of the research, development and extension (RDE) spectrum can be substantially enhanced through the DA Regional Integrated Agricultural Research Centers (RIARCs), which will provide technical information support to the provincial offices and link them to SUCs.

Agricultural extension can also be enhanced with the wider application of participatory action research paradigms, such as the farmer-scientist program introduced among subsistence corn farmers in the degraded hillsides in Cebu.

#### **2.2.3.4 The Role of Local Governments**

Agriculture should be a major component of local economic and social development in rural local governments. Their land use plans must be in consonance with not only current conditions, but also with their prediction of the trajectory of future developments in their agrarian reform communities, major crops and in areas beyond agriculture. Demand-based planning will help them encourage their farmers to focus on crops in which they will be competitive. They can also improve local standards through involvement in trade fairs and other means. Another task for LGUs is the nurture of ARCs and community-based systems operating in their areas. This props up agriculture as a way of life without forgetting its ability to provide sustained income to the populace.

#### **2.2.3.5. Convergence of Public and Private Sector (Corporate) Governance**

Good public governance induces effective corporate governance especially in joint public-private development programs. Reflective of poor governance is the Philippines' low ranking in terms of competitiveness and risk scores ratings. This poor performance stems from the relatively low volume and productivity of investments, which arises from perception of risks and deficiencies in the investment and private sector environment for private sector enterprises (World Bank, 2003).

To make asset reforms effective in the lowland, uplands and the coastal areas, the public sector must first analyze the likely governance conflicts arising from public and private statutes and the nature of utilization of the specific asset. In assets which are of open access in nature, but encroached in by private use, the likely effects will be high conflict. Examples are coastal areas and open sea access by private entities. In the same manner, high conflict situation can occur when the public will encroach in resource assets which are defined by statutes for individual use. For common property, the level of conflict will be likely at medium level.

In the long-run, export competitiveness depends on foreign direct investments (FDIs), which to a major extent depend on good governance. From 1990 to 2001, FDIs in the Philippines in terms of actual magnitude in billion US dollars and as percent of GDP lagged behind Malaysia and Thailand. In 2001, FDI for the Philippines was estimated at US\$14.2 billion which was 20% of GDP. In contrast, Malaysia and Thailand had FDIs of US\$53.3 billion

(58.4% of GDP) and US\$28.2 billion (22.3% of GDP), respectively, during the same period.

Private firms are encouraged to locate in coastal, upland and forest communities to operate core post-harvest operations. This is not charity as it will earn them proper income, nor is it the encouragement of unbridled capitalism since their ventures will be in consonance with community-based principles and will be transparent also to the main producers and their civil society supporters.

#### **2.2.3.6. Further Strengthening Civil Society**

Past experience has shown that a strong civil society plays a critical role in advancing good governance. In natural resource management, for example, there are positive results in involving indigenous people, people organizations and non-government organizations in community-based natural resource management. These groups perform the role as models for or watchdogs in the effective implementation of development programs in the agriculture and natural resource sector.

Philippine Agriculture 2020 now seeks to build upon this work by a new venture in asset reform for CBNRM areas. The developed concept is the giving of land titles to forest dwellers who are part of CBFMAs because of their proven stewardship of the forest. It would provide for sustenance of beneficiaries during the initial years while waiting for the income stream from agro-forest enterprises. Under this concept, POs and NGOs that represent forest dwellers in CBFMAs, in coordination with LGUs and the Department of Environment and Natural Resources, will take the lead in land assignment and distribution and continue to assist the new landowners in forestry management as a steward. They may organize the small holders as primary producers and as a cooperative to handle saw mill and other agribusiness operations, or backstop them in the negotiations with the private firm willing to invest in milling and transporting forest products.

### **3.0. Targets and Expected Accomplishments**

Projected targets and expected accomplishments of PA 2020 are only indicative, firstly, because at this stage of plan development the strategic plans of the 14 agricultural industrial clusters are not yet finalized. Secondly, the projections are based on individual industry projections based on the knowledge of individual experts of the clusters, crosschecked with existing time-series trends within the agriculture and natural resources sectors. Thirdly, the projections are static in nature and are not yet integrated into a quantitative model that will provide congruence and consistency across clusters.

rehabilitating the existing irrigation systems. The Plan projects a total physical irrigated area of 2.2 M ha in 2020.

Forest cover which is around 5.5 M ha (18% of total land area) in 2000–2004, is projected to expand to 10 M has (33%) due to intensified development interventions in the uplands.

Finally, the Plan also projects a 333% increase, to 255,000 ha in coastal areas for mariculture development from its low base of 58,000 ha during the 2000–2004 base period (Table 2).

#### **4.0 Financial Strategy**

PA 202 is a broad-base rural development initiative that builds upon and expands the coverage of AFMA in the management of ecosystems so vital to the viability of agriculture. PA 2020 also projects its vision into a longer time horizon.

The shortcoming of AFMA, if at all, is the lack of political will to deliver on the financing arrangements that can centrally affect its implementation.

Although the actual magnitude of funding PA 2020 has not been estimated, the source of financing, among others, can come from the following:

- Return of Marcos wealth currently being tapped by CARP
- Coconut levy – prioritized in coconut producing areas
- ACEF – with specific tariffs ploughed back to the affected subsector
- Sale of non-performing assets of government
- Bilateral and multilateral financial arrangements – with global partners interested in financing rural development programs.
- Agricultural land use conversion taxes – to be jointly implemented by National Government and LGUs
- Specific taxes on biofuels, ethanol and coconut methyl ester
- Cost recovery charges – users of water provided by watersheds, quarrying, share from ecotourism receipts
- Private contributions of industries for R&D, e.g. the Philsurin model for sugar and the Philippine Coconut Research and Development Foundation

## **5.0 Next Steps**

Philippine Agriculture 2020 is a work in progress. While the philosophy, pillars, goals, enabling strategies and general directions are clear, several steps need to be made to push us closer to our vision.

### **5.1. Improvement of the PA 2020 Draft**

The first set of steps will be technical in nature, focused on improving this draft.

1. The first step would entail the completion and review of the cluster strategic plans and logical framework. Putting together the documents needed using a new philosophy, goals and pillars has been a challenge to our team of hardworking scientists and agricultural stakeholders. The cluster approach itself is a big shift from the usual focus on commodity divisions. We also need to beef up the estimates of the levels of investments from both the public and private sector. The overall favorable response of the ASM to the PA 2020 efforts will provide the extra push to keep our volunteers focused on this work.

2. The second step will be to draft the financial strategy that will harness the resources to implement PA 2020. This issue represents the most obvious gap in the promulgation of PA 2020. The PA 2020 team needs to entice new members to provide this expertise because it is not a usual qualification of our current group of largely agricultural scientists.

3. As the PA 2020 team will be carefully listening to the views expressed during this Annual Scientific Meeting of the National Academy of Science and Technology in July 2005, the second step will be to commission specific studies on problematic issues raised in the ASM.

All these activities will result in the rewrite of the draft main report.

### **5.2. Democratic Consultation and Approval**

The second set of steps will be political in nature, as it seeks the participation, comments and endorsement of stakeholders, and the approval of the highest officials of the land.

1. A series of round-table discussions will be scheduled with representatives of concerned departments, the private sector from small-land holders to large agri-businesses, and civil society leaders.

2. This document will then be presented to the Secretaries of Agriculture, Environment and Natural Resources, Land Reform, and Science and Technology.



3. NAST will then present PA 2020 to the President and the Cabinet.

4. Simultaneously, the congress will be consulted on draft legislation that will emanate from the proposals of PA 2020. NAST and the now-expanded PA 2020 team will shepherd these bills through the public hearings in both Houses.

5. Parallel moves to present PA 2020 will be made to the people in different regions. This will increase public awareness of the directions agriculture will not take, and to encourage local communities and governments, corporations, producer groups, POs and NGOs to buy into the program.

## **VISION AND ASPIRATIONS FOR PHILIPPINE AGRICULTURE**

**Arthur C. Yap**

Secretary, Department of Agriculture

### **Abstract**

This paper describes the Department of Agriculture's vision of prosperous rural communities built on profitable farms that provide surplus for agro-industry and food security. Two major goals which the Department has focused on are (1) searching and developing 2 million ha of agribusiness land and aquamarine areas and (2) converting surplus production to lower prices of food items. For goal 1, 350,000 ha have been identified of which 70,000 ha have been developed with private sector, generating 124,000 new jobs. For Goal 2, the Department has expanded the supply and reduced the cost of basic food items by establishing efficient logistics and marketing system. Further, the Department has recommended a shift in focus from big farmers to small farmers and a change of program model from one that is supply-driven to one that is demand-driven and which is based on the principles of good governance based on transparency, accountability and predictability and allowing meaningful participation by stakeholders.

**Keywords:** Philippine agriculture, market-based, sustainable, agribusiness, food security

It is a great honor that as I end my term as Secretary of the Department of Agriculture (DA), you find it fitting to accord me this honor to be your keynote speaker and more especially, that you have placed agriculture at the center of this year's meeting of the Academy.

I hope that after this two-day meeting, you would have concretized your long-term plan which is market-driven, private sector-led, anchored on aggressive infrastructure and technology development, and which would require good governance by the DA family, local government units (LGUs), and other concerned stakeholders, including the private sector. During

my inaugural address in August 2004, I asked that all agriculture and fisheries stakeholders join me in bringing into reality the vision of prosperous rural communities built on profitable farms that provide surplus for agro-industry and food security. I believe this is a very critical plan that can contribute significantly to attaining such aspirations for our agricultural sector.

At the end of the day, for me it is not only food that is important, because if food is our only goal, then we can say that Philippine agriculture today must already be prosperous. This year, we see rice production growing from 11–12 to 13–14 million metric tons (mt) and we are targeting 14.8 to 15.1 million mt. Corn production is increasing from 3–4 to 5.5 million mt, and our target is 5.7 to 5.8 million mt. Philippine fisheries production is increasing geometrically. But somehow, rural poverty has not changed. For the past 30 years, the percentage of poverty incidence has remained the same. And therefore, when I came in, I was not just looking at the production component but at a prosperous rural community, prosperity built on profitable farms that provide a surplus for agro-industry and for food security.

Last month, we convened the National Agribusiness Summit participated in by the LGUs. During this summit, the LGUs pledged PhP700 million while DA pledged PhP280 to 300 million. The battlecry was that DA should concentrate on steering agriculture at the national level, provide the infrastructure and build a very strong research-based regulatory road mapping-based DA so that when the local governments make a decision, such decision is supported by the proper law or regulation. The LGUs should have a free hand to work on their plans and the details of their plans.

Since the second half of last year, we have been focusing our efforts to attain two major goals as spelled out by President Gloria M. Arroyo. The first goal is to search for and develop additional 2 million ha of agri-business land and aquamarine areas. As the President calculated, every one hectare that is opened is equivalent to one job created and which will eventually result in more jobs. This strategy will also help in decongesting the major urban centers. For the second goal, the President wants to convert the surplus production to lower the prices of food items like rice, sugar, vegetables, fish, poultry, pork, and maize in the major urban centers. The lowering of the price of maize will also benefit the livestock and poultry industry. Attaining this goal will also lead us to sustained farm and fisheries production, higher income and stable supplies.

Regarding the first goal, we have identified 350,000 ha out of the 2 million ha target. Of these, we have developed only 70,000 ha. This has

generated about 124,000 jobs already and I wish to highlight that this was done in tandem with San Miguel Corporation. We will develop the land only if the market is ready — if there is a ready market for cassava, for maize, for livestock, coffee or coconut or fruit crops. We are emphasizing here a market-based and sustainability-based agriculture. When I came into agriculture from the outside, this was what I first saw, the lack of market for agricultural produce. And I am really glad that PA 2020 is grounded on market-based and sustainability based-agriculture.

Some of the things we have done for Goal 1 are: a thousand hectare cassava contract-growing with San Miguel in Kalinga, a 500-ha coffee nursery and techno-demo farm in Maguindanao which is connected to the coffee outlets and coffee growers and exporters, 400 ha of cassava, banana, cardaba for banana chips and sweet potato in Quezon. In Bondoc Peninsula, we opened 13000 ha connected to the banana chips export, cassava and corn requirements of San Miguel. We likewise opened 60 ha for milkfish growing, deboning and processing plant in Capiz, a 150-ha seaweed nursery project in Pangasinan. We have also opened 1,500 ha in Southern Tagalog, in the Mt. Banahaw area. This is important because if the typhoons hit Central Luzon, this new area in Southern Luzon could supply the needed vegetables.

For Goal 2, we have addressed the expansion of supply and reduced the cost of basic food items. Thus, we are establishing an efficient logistics and marketing system that would facilitate the movement and distribution of products to the markets and eventually to consumers. As part of the strategy, we established the *Huwarang Palengke* or Model Markets. Initially, we opened ten markets for our farm producers. Many of you probably know that not all of the so-called “Baguio vegetables” come from Baguio or from Benguet or the Cordilleras. Some of these vegetables are actually produced in Region 1 or 2 and are brought to Baguio and brought back again to the lowland! Thus, carrots which sell at PhP 10, potato at PhP 10 or 15 per kg in the Cordillera, when brought to Manila will cost PhP40 to 50 per kg. The average layering of vegetables is 5, thus the price hike as they get to the consumers. We have the same situation with produce from Mindoro, from Palawan etc. We have the resources and the products but what we lack is proper market linkage.

In these model markets, you can buy basic food items which are easily PhP 5 to 10 per kg lower than the regular markets because of the more direct connections between producer and vendor. We are also constructing

more farm-to-market roads and we provide refrigerated trucks which can be rented. We are connecting them to the Ro-Ro. Right now, the President is studying a new Executive Order (EO) which will convert noncommercial ports to private commercial ports. We are looking into the possibility of opening 380 new ports. Why will one wait for the government to construct ports when right now, there are 380 private noncommercial ports which are not being used? When the President signs this new EO, there will be 380 new destinations and this can further spur investments in domestic shipping. Incidentally, the Development Bank of the Philippines has laid aside PhP5 billion for the deregulation of domestic shipping industry to aid investors. However, there have been no takers because of the few destinations available. Thus, it is critical that this EO be signed to open up the new destinations.

To further help our producers link up to the markets, we have interceded with logistic movers like the Aboitiz Group to drop their 15% tariff for food transportation. We have asked the Metro Manila Development Authority to provide a food lane for pre-agreed routes so that food can be transported around the city unhampered. We have also linked our agricultural producers with supermarkets such as SM, Rustan's, Shopwise, Waltermart, Landmark and Hi-Top.

We are also trying to address the high costs of fish. We observed that at the Navotas fish port, when a *banyera* (large basin) of *galunggong* is first brought, it costs only PhP 25 per kg. By the time it gets to the market, the cost is already PhP 55 per kg. We want to reduce the cost of fish from source to the final market place. We are trying to build this chain. This is critical in the implementation of PA 2020.

The first pillar of PA 2020 is managing agriculture as a business way of life, as a livelihood which is what we have been trying to impart to stakeholders. We are doing our best to influence our farmers not just to sell to the first buyer that comes. If what we want is to build a constant supply of food at affordable prices, you must guarantee the market, including going into processing food. And so, one market strategy that we have adopted is packaging mixtures of vegetables for different viands, such as for *chopsuey*, for *kare-kare*, for *pinakbet*, and even including the sauce mixes. We devised these packages with the National Nutrition Council. However, the regular markets have not accepted these packs because they claim that such packs compete with their own retailed products. Thus, we are selling them now in supermarkets and in three weeks we sold 60,000 packs on a trial basis.

What we are discovering is that you must control your point of sale if you want to help market linkage. For PA 2020, to really help the farmer constituents, you also need to find a way to link them up to the market and open up your own market. Unless you control your point of sale, whatever gains and benefits made along the supply chain will be confiscated by the market player at that point. And they are not going to pass the savings on to the consumers.

We are also coming up with other projects on pork, vegetables and fish, giving them attractive names such as “Fish be with You” and new packaging. We want to inspire our farmers and fisherfolks by showing them how things are done. There is no dole out in our programs. They pay rent for trucks, they pay the fare on the Ro-Ro, and they pay the packagers. Not only do we increase the development of agri-business lands. We bring them to really small communities.

To close my talk, I also wish to inform you that we are recommending a shift in focus from big farmers to small farmers and a change of program model from one that is supply-driven to one that is demand-driven. It is a model based on the principles of good governance based on transparency, accountability, and predictability, and allowing meaningful participation by stakeholders.

On Friday, I am turning over the reigns of leadership of the Department to Secretary Domingo Panganiban. Most of the things that I have discussed with you are in the terminal report which I will submit to the new secretary and which is part of the Economic Policy Reform Agenda that has been developed by Dr. Cielito Habito, former National Economic Development Authority Secretary and now Director of the Ateneo Center for Economic Research and Development.

I would like to end by thanking many of you whom I have had the honor, pleasure and privilege to have known and to have worked with. Many of you have been selfless and generous in giving ideas and inputs. I hope to continue meeting with a lot of you and taking your ideas and initiatives into the Department of Agriculture as we make this long quest, this journey to transform Philippine agriculture toward the creation of prosperous communities and food security for our country as our contribution to nation building.



## **PHILIPPINE AGRICULTURE 2020**

**Academician Emil Q. Javier, Ph.D.**

Vice President, National Academy of Science and Technology

NAST is the country's highest scientific recognition and advisory body. It is composed of about 50 members divided into six disciplines, which takes turns in organizing the annual scientific meeting and so this year is the turn of agriculture. In the exercise of NAST's advisory function, the agricultural sciences division decided to take a crack at articulating a strategic long-term plan for agriculture. Over the years we have had four- to six-year medium-term plans of successive national administrations but as far as I can recall we have never had a longer-term strategic plan. Clearly, we are changing secretaries in agriculture so fast that I have lost count. I think we have had eleven or twelve during the last eighteen years. One is stepping down by Friday and we have another secretary by Friday. Clearly, we need a long-term vision for stability and continuity.

The monumental task of putting this strategic plan was assigned by the National Academy to a writing panel whose job it was to look at previous plans of NEDA, the plans of various departments and agencies, and the medium-term plan of the GMA administration, and then harvest ideas from knowledgeable people and stakeholders and put them together into what is now PA 2020. The PA 2020 document will consist of the Executive Summary, the main report and 14 volumes of industry cluster of strategic plans, and a number of stand alone contributions. At present, only the Executive Summary is available to the general public while only the panelists and moderators have the rest of the documents.

Actually PA 2020 is a huge collective effort involving the staff of three departments (Department of Science and Technology (DOST), Department of Agriculture (DA) and Department of Environment and Natural Resources (DENR)) and their agencies, the academe, farmers, and agribusiness representatives, NGOs and foundations.



### **Vision for Agriculture in PA 2020**

What is the vision for agriculture in PA 2020? The vision is of robust and vibrant agricultural and natural resources production systems and ecosystems services that improve and sustain human well-being in the Philippines. This is a collective vision of well meaning Filipinos. Many of them are here and they are academics, teachers, specialists, administrators, farmers, and agribusiness representatives who have something in common: their love for the land. PA 2020 is at the same time a message of hope and confidence which I know you'll realize is most timely in the current atmosphere of national despair and uncertainty.

If there's one thing we all seem to agree, all is not well in agriculture with (1) anemic agriculture performance due to failed policies; (2) inadequate infrastructure; (3) declining competitiveness; (4) deteriorating environment; (5) continuing food imports; and (6) pervasive rural poverty. But if you look at agriculture in the last 20 or 30 years, and we try to benchmark ourselves with our neighbors in Asia, we find that we pale in comparison in almost all counts. The bottom line is: poverty continues to be pervasive in the countryside. We are facing formidable challenges, our population is growing at 2.36% per annum adding a million Filipinos every year. It is a population growth we regrettably have to anticipate to continue in foreseeable future in the absence of a strong family planning program.

Globalization is upon us and tariff rates in agriculture will go down to five percent across the board and we must shape up to compete or to be flooded under by imports particularly from China. But we refuse to accept this state of affairs because we know we can do better. We know we can do better because we have the people and the basic institutions are in place. We have the natural resources, technologies are at hand or forthcoming but most importantly we have a grand vision and an imaginative plan to get there.

### **PA 2020 Targets**

What do we expect by 2020 in agriculture? What are our broad targets? Our agriculture grew at the anemic rate of 2.5% during 1980-2004. That is just barely keeping up with the population growth rate. We know we could do much better than that. Our plan is to grow at the rate of 7%. Mind you, although we had a 2.5% growth rate over the past 25 years, during the last 3 or 4 years, we were growing at 4.5%, so 7% is a reasonable and realizable target. If we do that, then the growth value added from agriculture will more than double from PhP 206 to PhP 422 billion, we will generate for

more Filipinos from 11 to 23 million and the export receipts will rise from US\$1.9 billion to US\$9.4 billion so their gross value added will be more than double, the same with employment and a four-fold increase in export receipts over this 15-year period. During the same period, our population will grow from 84 million to 105 million, or a 25% increase in population.

### **Conceptual Framework**

In formulating PA 2020, we adopted for our conceptual framework the Millennium Ecosystems Assessment Framework that connects human well-being with integrity of ecosystems and their services. This came out of a document of March of this year from a huge World Bank and UN global study involving 13,000 experts from 95 countries over a four-year period. This framework emphasizes the linkage between human well-being and ecosystems. But it has a very important basis which is that the action of people results not just from their concerns about human well-being but also considerations of the intrinsic value of species and ecosystems in themselves irrespective of their utility to someone else. I think it is very important to note because that is the inspiration for the third pillar of PA 2020.

In practical terms, this framework says that human well-being is influenced by three subsystems: the systems that deal with agriculture, the systems that deal with environment and natural resources, and the social environment. It is, in this sense, that PA 2020 departs from AFMA—the legislation for the modernization of agriculture and fisheries, because AFMA rightfully focuses on the agricultural systems but this framework says that the ultimate objective is human well-being. The attention to agriculture must be complemented by simultaneous attention to the ecosystems that support agriculture and social environment in which that system operates. Up to the 1970s, we had the old Department of Agriculture and Natural Resources (DANR) and for some reasons this was split up. This framework suggests that perhaps it is time to revisit the structure of the executive department and maybe the old DANR setup may have been correct after all.

The Millennium Ecosystem Framework defines human well-being in terms of access to basic materials for a good life, access to good health, good social relations, security, and freedom of choice and action. Thus, in a parallel manner, our plan translates human well-being into five national development goals. We are all familiar with this enumeration. We want to eradicate poverty and hunger, we want to be globally competitive, to be able to hold our own but we want to make sure that we attain these objectives not at the expense of the long-term sustainability of our

environment. We are familiar with the first four goals but the odd entry in this enumeration is justice and peace. Perhaps, we should begin wondering what justice and peace have to do with agriculture and natural resources. Justice and peace, which are very obvious development goals in the Philippine context, have a lot of impact on agriculture. Crops can be least in the midst of war. The grievances of the peasants and the fisherfolks about the unfairness of the distributions of benefits affect productivity and investments.

Having a grip on the vision and the course, there remains the practical matter of relating vision, goals, and objectives and relating objectives to targets, activities and measures of progress and in order to do that we adopted a logical frame, which is a simple systematic way of linking visions with activities and so forth and so on.

This is admittedly one of the methodological contributions and the problems of PA 2020. I mentioned already the fourteen industry cluster strategic plans and so our writers and panels must now conform their strategic plans into the logical frame and this is proving to be a very complicated task. First because all of us are doing it for the first time and second, the natural resources and ecosystems objectives are quite new to us and therefore more difficult to quantify. The bread and butter of PA 2020 rest in the strategic plans of the fourteen agro-industry clusters. Another point of departure of PA 2020 from AFMA and the previous NEDA plans is the amount of technical details in these documents compared with the NEDA plans. In other words, this macro numbers that I have mentioned in terms of targets will build up from these very detailed technical studies by panels representing the fourteen agro-industrial sectors.

This conceptual development framework is summarized in this graph (Figure 1).

### **The Philosophy, Pillars and Enabling Strategies of PA 2020**

The social philosophy that underlies PA 2020 is the awareness that agriculture is a way of life, that agriculture is also culture, and that the business of agriculture, the livelihood, is only a part, albeit a very significant part of its all-encompassing character as a way of life. This strategic plan rests on three pillars: organizing and managing agriculture as a business, directly alleviating poverty through asset reform, and nurturing the values of nature and community in our people.

The first pillar is the agribusiness model; the focus is on productivity, profitability, and competitiveness. The second pillar is about equity and

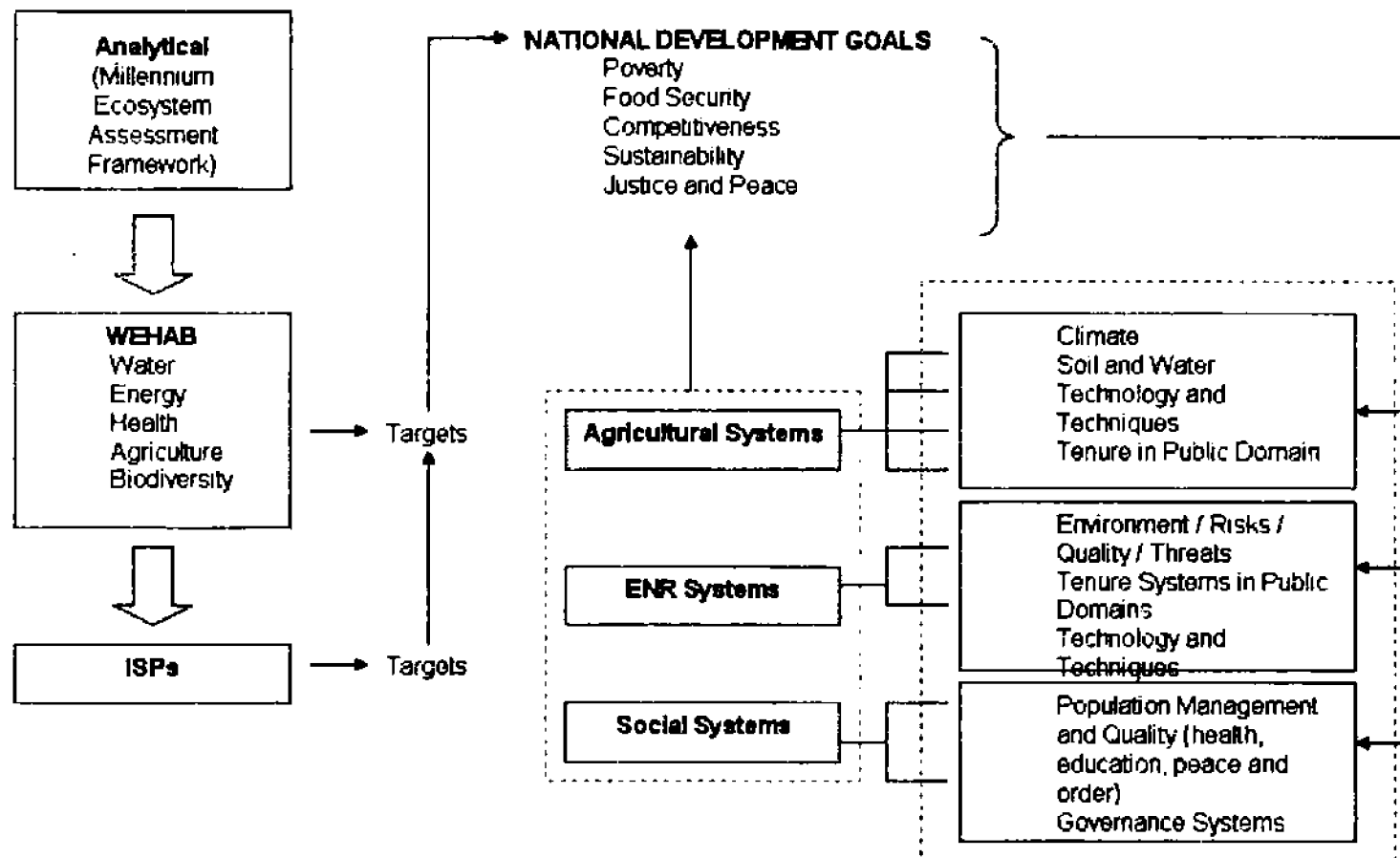


Figure 1. Conceptual development framework of Philippine Agriculture 2020.

income. The third pillar which reinforces the first two, are two aspects of the culture of agriculture which has to do with love and respect for nature in the sense of solidarity with our fellowmen. The first pillar organizing and managing agricultural as a business has four elements—making entrepreneurs out of subsistence farmers, improving the efficiency of the supply chain, transforming products and markets for higher value, and the clustering of industries to strengthen the linkages between primary producers, input suppliers, processors, markets, and so on.

After hearing Secretary Yap, we could see very clearly that this is the first and easily the most important pillar as far as the Department of Agriculture is concerned. As the Secretary mentioned, this agribusiness model of organizing and managing agriculture as a business requires a paradigm shift. Not only would the farmers themselves look beyond primary production but they have to make sure they have markets to bring the products. This will also require a paradigm shift in the Department of Agriculture itself, in the universities that conduct research on agriculture, and so on. The pillar on asset reform as a key instrument for reducing poverty is based on the fact that in the hierarchy of development goals clearly, reducing poverty is cardinal. What is poverty? It is the lack of access to income or lack of assets that generate income. Poverty largely is a rural phenomenon and land is the major asset and, therefore, a redistribution of assets is the most direct way of attacking poverty. Second, assets reform would hopefully stimulate investments by the rights holders themselves to make assets more productive.

### **Major Recommendations of PA 2020**

What are some of the major recommendations as far as this PA 2020 is concerned? In asset reform, you could look at asset reforms in the lowlands, uplands, coastal communities. As far as asset reform in the lowlands is concerned, we have two recommendations: we must accelerate the completion of the Comprehensive Agrarian Reform Program (CARP), the original coverage of 4.2 million of which 800,000 hectares are left. So we are saying, we have to move on, accelerate completion of the land reform program so that by 2013, the land transfer part of agrarian reform is completed.

But we know that land transfer is not sufficient, it is necessary but not sufficient condition to reducing poverty. The second recommendation is that the beneficiaries must be given the means to make the land assets productive. Here as part of the agrarian reform program, the beneficiaries

are being organized into agrarian reform communities (ARC). So far, 1600 ARC have been organized but only half of them had been provided government support to make them productive. The PA 2020 idea is to complete agrarian reform in the lowlands. We must organize finance and empower at least those 1,600 agrarian reform communities so that they become viable agro-industrial planters.

In terms of the asset reform in the uplands, this is easily one of the more interesting recommendations. We suggest the private titling of production forests to deserving forest occupants. The Department of Environment and Natural Resources has classified public forest lands into protection forests and production forests. Out of the 8.4 million ha of production forests, more than five million ha are now covered by the so-called community-based forestry management agreements involving more than 400,000 thousands forest households organized into 2,800 people's organizations. We propose a radical change in forest lands policy, building upon the initial successes of the social forestry program, and provide incentives for better compliance with this collective community-based forest management agreements. We have to rely on the people's organizations, the local government units and of course, DENR. Similarly, as in agrarian reform in the lowlands, the mere transfer of land in the private domain will not be enough and therefore this initiative must be coordinated with incentives for the establishment of processing plants in those production forest areas to absorb forest products of the incipient tree estates because if these forest lands are now given to occupants and they are encouraged to plant forest trees or farm or whatever, we have the markets that will absorb their produce by way of forest product establishments.

Finally, the poorest Filipinos are the coastal fisherfolks. Right now, we have 59,000 ha of coastal shallow waters farmed with seaweed and some finfish, abalone, and sea cucumber. In 2003, this sector of mariculture was worth PhP 3.67 billion. We propose that we expand this area under mariculture from 59,000 ha to 255,000 ha over 15 years. I think you can sense that in fact this is a major recommendation that will have impact on justice and peace, because a lot of those suitable coastal shallow waters are in Mindanao and part of the Visayas where many cultural minorities live.

The third and final pillar has to do with nurture of nature and community values. Agriculture as a way of life has many dimensions and we are focusing on the value of respect and love for the environment which has implications

on sustainability and solidarity with fellow members of the community. Because as long as we have small fragmented holdings, you need people coming together, cooperating together, so they become more efficient, more vigilant in protecting the natural resources and so on. One financial implication here is the prospects for ecotourism.

### **Enabling Strategies**

But how do we accomplish all these objectives of PA 2020? These activities and strategies can be bundled into three enabling strategies—technology development, investments, and governance reforms.

Technology development is the “efficiency driver” of the supply chain in the provision of agricultural goods and services. As an enabling strategy, production technology innovations will reduce per unit cost of production resulting in enhanced efficiency in the agribusiness system. Green technologies on the other hand will reinforce the integrity of ecosystems and guarantee their sustainability over time. Secretary Yap has mentioned that we have to analyze the weaknesses and opportunities of the supply chain at every step and that should provide us some indication of where our research priorities ought to lie.

The second enabling strategy is investment because all of this will not happen if you do not have investments in irrigations, roads, seaports, information and communications and post harvest. This will not happen if we don’t invest in human capital, and if we do not strengthen the institutions engaged in or responsible for agricultural development.

The third enabling strategy is to address the whole range of things under governance. As Secretary Yap mentioned there is a parallel effort led by Dr. Cielito Habito, former NEDA Secretary and now Director of the Ateneo Center for Economic Research and Development to look at those policy and governance reforms necessary to get agriculture moving. We have a long list but let me just focus on the legislation that would be necessary if we were to proceed with this plan. First of all there is a pending legislation on the collateral value of CARP lands. There is a debate on this but the writing panel and our resource persons are of the opinion that it is best that the CARP lands have collateral value so that the asset holders can now go to the bank and obtain credit to invest in their lands. A second legislation is necessary if we are going to release the public forest lands to the forest dwellers. As I have said this is a very important paradigm and this would require legislation. There are now plans for producing biofuels on a large

scale—ethanol from sugar and from cassava, and coconut methyl ester from the coconut. The investors are waiting for signals because they would not go into huge investments in alcohol refineries and biodiesel plants without the corresponding legislation that would make mandatory the blending of ethanol with gasoline and coconut methyl ester as biodiesel. This will save precious foreign exchange but also make us all in compliance with the Clean Air Act.

The document is not yet complete simply because the clusters have not really finalized the report. In the case of sugar and coconut which are the better prepared cluster plans for now because there are agencies responsible for them, unfortunately the biofuels programs of those two clusters have not yet been incorporated.

### **The Example of Rice**

So how do we see Philippine Agriculture in 2020 as far as rice is concerned? First we will be self-sufficient in rice in 2020 in spite of the fact that today we are still importing a million tons every year. And mind you, we will reduce the area harvested from rice from 4 million ha to 3.5 million ha and in spite of the fact that our population will have increased from 84 million to 105 million by then. And now how do we do that? One obvious way is to expand hybrid rice from 250,000 ha to one million hectares. We will use certified hybrid seeds, we are going to double our fertilization rate from 65 kg of nutrients per hectare to 130 kg. We will increase the rice milling recovery from 6.5 to 6.7%. By the way, I hope all of you will eat brown rice because it is more healthy. It has more fiber but the recovery for brown rice is 72%. So if only all of us will eat brown rice at 72% milling recovery we would have met all our rice requirement. We will reduce postharvest losses from 15 to 10% and of course we will be very rich by then, and we will eat less rice from 105 to maybe 100 kg per capita.

### **The Next Steps**

What are the next steps as far as this document is concerned? We have to review and complete the industry cluster plans and make them conform with the logical frame. We have to consult with the departments, with the agencies, producer groups, processors, traders and civil society, but most importantly we have to flesh out the financing plans and strategy. We have a very skimpy treatment of that section but that is a reflection of the expertise we have access to because we scientists normally have very little to say in terms on where to get the money. Then the document of



course must be approved by NAST because this document will have the imprimatur of the Academy. By 15 December we should be ready to endorse Philippine Agriculture 2020 to the President, to the Cabinet and to the Congress. And also we have to bring this to the regions to promote awareness and concern for agriculture and support for agriculture.

### **In Conclusion**

We have presented to you the broad outlines of this long-term strategic plan. We have a conceptual development framework, social philosophy, pillars, and three enabling strategies. One of the reasons in bringing this work in progress before you is to solicit your reactions and comments to this broad outline of the Philippine Agriculture 2020 so that we can go back to the drawing board, consult more people and finalize this.

Philippine Agriculture 2020 is a vision of a bright future, is a message of hope and confidence in ourselves and our future as a nation. And we submit that this is very timely especially during this period of national despondency and uncertainty. But we have all the reasons to be confident and hopeful of the future because we have the people, we have the institutions, the natural resources, we have the technologies and we can generate our own, and because we have a vision and a plan. What we need to do now is to build a national consensus to see this plan through.

Let me end with a quote from a very learned Sanskrit poet and dramatist: "For yesterday is but a dream, and tomorrow only a vision, but today well-lived makes every yesterday a dream of happiness and every tomorrow has vision of hope."

This is our vision of hope. Thank you.

**Philippine Agriculture 2020: A Strategy for Poverty Alleviation, Food Security, Global Competitiveness, Sustainability, Justice and Peace**

**ENABLING ENVIRONMENT FOR PA 2020**

**Donato B. Antiporta**

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First let me congratulate the leadership of NAST for this important initiative. I believe the initial importance of this undertaking is the way the NAST has become an advocate for the development of Philippine agriculture and the rural sector. I wish to thank the organizers for the invitation to participate as a panelist and I consider it as a rare honor and privilege to share my perspective and views on Philippine Agriculture with this group of eminent scientists and academicians in the country.

I also would like to congratulate the writing panel for a job well done although many more things are needed to complete the draft. I know you have put quite an effort to produce this document and it comes very timely because having seen agriculture in many other countries in the region, it saddens me to know that the performance of our agriculture can quite be quickly summarized as having lagged behind those of other countries in the region. More disturbingly, the growth rate of Philippine agriculture, during that period, if you take away the first few years of this millennium, has lagged behind the country's population growth rate. However, I share the vision of hope and confidence that the previous speakers so eloquently conveyed. The reasons and causes behind the performance have been expertly assessed and analyzed in many documents and the present volume in progress also represents an attempt to comprehensively evaluate and integrate all aspects of knowledge on this topic. I share the many visions and recommendations contained therein and after hearing the Secretary of Agriculture, the keynote speaker this morning, there seems to be very little to add.

However, I would like to see this great vision articulated in terms of strategy, a complete agenda of action plans, a road map that states what

needs to be done by whom and when, who should do what in the next 6 months, in the next year, in the next 5 years and so on and so forth. It would have to lay out the resource requirements to realize the vision and where the resources would come from. In this regard, I would only add that we should be realistic in terms of what the public sector can do and can spare. The crucial role, in my view, of the public sector lies in the provision of an enabling environment that will encourage participation and initiatives in the development of agriculture in the rural sector. This includes supplying of public goods and preventing market failures through appropriate policies. The distinction between the roles of the public and the private sectors need to be embedded in the strategy and road map in order to assure that we would have a sustainable approach to agricultural and rural development. Indeed, the role of government can easily be overly estimated and it could become overbearing as to stifle private sector initiatives.

I also agree with the other speakers on the need to move the strategy and road map away from a commodity-by-commodity approach and to be more oriented to the development of resources and endowments of farmers, particularly the small and marginal farmers. I believe that the PA 2020 has made references to this, moving away from commodity-by-commodity approach. Nonetheless, there seems to still have a focus on a few commodities in the outline of the action plan, although I noted from Dr. Javier's presentation that this is because the other contributions have not yet come. I am sure this apparent inconsistency between the recommendation in the main document and what the outline implies would be remedied in finalizing the strategy document.

Let me then make some comments on competitiveness as one of the dimensions of the vision. Here I would say that affordable prices of food as well as price stability are a necessary condition before competitiveness. Our studies show that food price levels and stability can make a difference in poverty incidence by as much as 12–15% points in the short run. Food security in nutrition and health linkages can accelerate the demographic transition to a lower fertility rate. Demographic transition is needed to reduce household dependency rates and that way generate internal savings that would fuel economic development. This is an important consideration that has not been taken into the policy thinking in the country. The experience in East Asia is essentially that the demographic transition increased savings rate that fuel the investment that was needed for the economic development.

I would emphasize, however, that low and stable prices of food must be mediated through productivity gains. The productivity gains must cut

across commodities as opposed to emphasis on single crops. Why? This is because the aggregate agricultural supply must shift to the left for the gains to be sustainable. The problem with emphasizing commodities is that what you gain in one, you might lose in the other because they compete in production resources and prices. So what fundamental ways should be followed? One is to focus on applied research and development and its delivery mechanisms because the conveyor of technology from the laboratory to the farms is the seed. Thus, the document must give some thoughts on how to encourage development of a vibrant, competitive, private sector-driven seed industry. Without this, the technology will not be available to the farmers. The second point I want to emphasize is the improvement of the resource-base of the small and marginal farmers, the adoption of land-augmenting technology because land is scarce and the adoption of small-scale low-cost farmer-own irrigation technology. These will offer some opportunities to mitigate the constraints.

I fully endorse the recommendation of PA 2020; this is quite doable with a short gestation period. I'd like to end my comments with some caution about asset reform. I'm not against it; on the contrary, I am for it but the way it is done must be thoroughly and critically analyzed and evaluated. Not doing it could introduce so much uncertainty which might deter the needed investment in various sectors. Once again, thank you very much for this opportunity.



**Philippine Agriculture 2020: A Strategy for Poverty Alleviation, Food Security, Global Competitiveness, Sustainability, Justice and Peace**

**TRANSACTION COSTS OF EXCHANGE OF ASSETS AND  
PROPERTY RIGHTS**

**Ramon L. Clarete**

Professor, School of Economics  
University of the Philippines Diliman  
Quezon City

First of all, I would like to thank the Academy, particularly, Dr. Javier, for inviting me to provide comments on the draft of the Philippine Agriculture 2020. I think it is a great draft document and I would like to congratulate the people behind the drafting of this particular report for its very comprehensive nature and the report is moving in the directions I would personally like Philippine Agriculture to be moving to.

My comments actually would be more like a complement in terms of the philosophy of the particular document and I would like to highlight a framework that is gaining ground in the academic circles, at least in the economics profession, the concept of transactions costs. We do have poverty in the rural areas and that, in particular, poverty is the result of the underdevelopment of the rural areas and of our agriculture. And I think it hinges on the fact that people are not exchanging assets as frequently or as fast or as substantially as it should. There are farmers, for example, who own lands; they have a lot of neighbors but, unfortunately, are not utilizing much of these resources. And there is a very good reason why they are not doing this. It is because there is no sense in increasing your productivity if you cannot sell this to the market, and that highlights the first concept of transactions cost, which is really cost associated with exchanging assets, especially for agriculture. This is very important because we are moving products across space unlike in industry where factories in the urban centers and the markets are nearby. We do have a very important challenge in agriculture on how to do this very well. In the past 25 years, we have rightfully called for investments on infrastructures, highways, ports, transport

systems in order to reduce this particular cost. And we have actually succeeded a bit but we need a larger degree of success. I think this draft document Agriculture 2020 is moving in that particular direction.

But let me highlight the fine points with respect to this first type of transactions costs. This is the whole business of logistics, moving the product across space in a way that actually makes the product competitive at the final end of the market. There would be some need not only on just public infrastructure, the highways, the bridges, the ports etc. We also need investments in some local private goods such as common service facilities. If they are not there, this is going to sort of block the flow of the goods from the rural areas to the population centers of our country and across our borders. We can address this problem by pooling together several players in the supply chains that have their own self-interests, coordinating their investments to form one effective system in producing the product, processing the product and bringing this product across space to the market. This is actually a very important innovation that we should promote and study very well. There is no single model because this particular idea will work with the environment it is in. That's why we need comparative institutional analysis on what works. This calls for researchers particularly those in the agribusiness department of the universities to analyze models that work, why they work, and how they effectively reduce the transactions costs associated with exchanging assets from among stakeholders in Philippine Agriculture.

The second point is on another concept of transactions cost, that of property rights. Before we are going to deal business with one another, it is important to know whether or not we are going to be protected with respect to our property rights. There's even a prior concern about whether or not property rights are well defined. One of the pillars, for example, the second pillar that I recall is about returning forest land to forest dwellers and we need legislation for that. This is very good because these forest dwellers can be mobilized to protect the environment, but without assigning the property rights to them, they will not be able to do that. Thus, defining property rights is a very important first step to do.

Of course, there is the business of enforcing property rights especially when you are going to make investments. Since these are large investments that would last for years, you need to make sure whether your interest as owner of this particular money that is about to be invested is going to be protected with existing laws and that the judiciary system is efficient enough

to enforce those property rights. Now if that is very weak in the system, even though we have the infrastructure to cross space and move products from rural areas to the population centers, there would not be major investments in Philippine agriculture by private businessmen.

I would like the framers of PA 2020 to consider one important role which is really the role of coordination. The role of a coordinator is to bring various players who should be part of the supply chain. These include the scientific community who developed the technologies, and others that are needed in order to bring the right product and to process them more effectively and efficiently. They too need to be part of the supply chain. The coordinator could be one of the leading investors in a supply chain. The coordinator does not have to be from the Philippine government or the DA but we need people who have developed skills in this area who can identify what actually is needed, what works and who to contact, and who to share this information that he has for business opportunities for Philippine agriculture. Thus, coordination is actually an antidote to the underdevelopment that is there. Many resources are underutilized and they are underutilized because the owners of these resources do not know how best to use these resources for private gain. The coordinator may have the advantage of getting, of knowing this information and we need more of this kind of people for Philippine agriculture.

I was really glad to hear the speech of Sec. Yap basically expounding on his own experience as secretary of agriculture towards this end. I think he really showcases what we have been trying to understand on what works in this particular area of underdevelopment in the rural areas. In the end I would just like to share the optimism of the framers of the PA 2020. It is just right to aim for something that may be ambitious to others but it is always good to have some fighting targets. But I think it is important to focus on strategy, on how to do this, and my own contribution, I think, to this is really to highlight these two concepts of transaction costs—one, the costs associated with exchange of assets and second, property rights. Thank you.





**A Strategy for Poverty Alleviation, Food Security, Competitiveness  
and Sustainability**

**HIGHER PRODUCTIVITY, FOOD SECURITY AND  
AGRIBUSINESS**

**Manuel Q. Lim, Jr.**

President

National Agribusiness Development Center Foundation Inc.

**Introduction**

The Main Report is monumental and daunting. In the first part I will therefore limit my comments on and around Dr. F. A. Bernardo's paper, *Food*

*Security and Poverty Alleviation: Trends, Realities, Challenges and Strategies*, not because it is not monumental, nor daunting, but because it is bite-size. In the second part I will throw in a few other supplementary notes.

**The Main Report**

**1. Megatrends Affecting National Food Security**

The technology advances in rice and corn production may be turning the supply problem around through higher productivity with less than proportionately higher cost, and in the case of corn at reduced pollution levels. More work is needed to reduce the cost of inorganic fertilizers and farm chemicals, at the same time shifting to more cost-effective organic and biological substitutes. Here the technologies may be ready for kick-off, but policy reforms are needed to encourage their adoption, such as tax and market price incentives.

The opportunities for expanding irrigation are there, not only for rice, but especially for corn where advanced technology will allow additional crops without risking borer infestation, in some cases maybe even drought conditions. Irrigated corn will receive the bonus of better volumes when prices are higher—also bonus for the millers and growers whose inventory carrying costs will be reduced. This will become even more beneficial as

more corn is grown where the pigs and chickens are, and the other way around — a triple win, if one includes transport cost reduction.

But something has to be done to induce the farmers to maintain their irrigation systems. Community-base is a good move. Perhaps new and even existing national systems could be redesigned for wholesale delivery to smaller CISOs. But more importantly, maintaining the systems should not only be affordable but imperative for attaining/maintaining profitability of the farming operations, the responsibility for which the farmers may become more willing to assume.

It is clear that mechanization will help by lowering production costs and improving yields. Moreover, it will reduce post harvest losses and transport and handling costs. The local industry is ready to supply most of the needs, even including ingeniously designed farm tractors and implements.

Hopefully these improvements will bring the cost of “wage goods” to a level where economic gains are not eroded by higher food costs, particularly in in-migration areas.

As an afterthought, why does NFA buy high and sell low? NFA is supposed to be the buyer of last resort, i.e., when *palay* market prices fall below costs; and seller of last resort, i.e., when rice market prices rise beyond affordable levels. This does not happen when rice is traded for political favors. A businesslike management of NFA can be self-sustaining, or close to it.

## 2. Major Socioeconomic and Production Factors Affecting Food Security

These are my comments and recommendations on the socioeconomic and production factors affecting food security.

People may find the uplands less inviting if there are attractive jobs or livelihood opportunities in the sloping and lowlands that will allow them to earn enough to buy their food, rather than grow it.

Aquaculture is the wave of the future, in so far as supply of animal protein is concerned. Additionally it delivers to where it is badly needed and it affords additional income. The technologies and other needed resources are there.

There is a need to re-examine the recommendation of leasing land as a permanent business step, or exchanging it for shares in a corporation. A better idea may be to look into re-consolidation of small parcels under progressive conditions.

Credit is a distinct and serious problem. While it can be attenuated by good organization and/or supply agreements, there is a need to request the Agricultural Credit Policy Council (ACPC) to finalize and implement the Agro-Industry Modernization Credit and Financing Program (AMCFP), as directed by the AFMA. Credit and finance remain critical hurdles in agricultural development. In fact, credit and finance should occupy a much more prominent position in the section "Infrastructure and Services" in the Main Report, even as a separate strategic plan.

Regarding enhancing household food security through poverty alleviation/ need for major changes in government policies and reorientation and reorganization of RDE services:

Certainly, those who do not even have enough staples to eat deserve prior attention.

The shift from monocrop to system cropping is not a problem. In fact most subsistence farmers follow system cropping precisely for subsistence, rather than for optimizing resources use. They are trapped in it. Moving from that to agro-industry is not even thinkable. But superior cropping systems become attainable with organization.

Therefore the reorientation of RDE has to be sensitive to the kind of resources that farmers have access to, either individually or communally. Some are rich in resources, some can be rich, or richer, if they join forces with others, and others are simply destitute.

The topic of organization cuts across, and will be taken up more thoroughly below. Suffice it to say here that there is a critical need for honest and meaningful coordination between government agencies/ bodies in RDE to improve the sector's share in nation building at the same time raising the quality of life for those who live and work there. **But government should only support, not undertake the effort, not even in the organization of the smallholders/Rural Producers Organizations. Only the private sector can do that.** This will be discussed more below.

## Supplementary Notes

### 1. Situation

R.A. 6657, the Comprehensive Agrarian Reform Law (CARL), was approved on 10 June 1988. It was the culmination of ferment for social justice in the rural areas that dates back to the Spanish occupation. This

law's centerpiece is the principle of "landowner-tiller", meaning that the farm worker should own the land he tills. Thus the law sought to attain the sociological goal of empowering the farm worker through the economic means of transferring the ownership, over the resources that he works, from the landlord to the tenant.

Since agricultural land is the major resource in agriculture, the law sought to distribute this among those who were tilling it as the means for attaining the principle of landowner-tiller. The principal task under the law, therefore, became the acquisition of land, in excess of five hectares for each beneficial owner, and distributing it among the legally-vested beneficiaries.

**But the real bottom line of agrarian reform should be access to and management of agricultural resources. While land is the major resource, it is not the only resource in agriculture.** In its statement of policies, the Act seeks to improve the lot of the former tenants, to offer former landowners opportunities to reinvest the proceeds from the transfer back into agriculture, and to spur economic development in the rural areas. Thus, from the broad objectives of **agrarian reform**, the Act's provisions for implementation narrowed down to purely **land reform**. And in this constricted scope, the drive for access to and management of agricultural resources deteriorated to an obsession for pure transfer of land ownership with little or no regard to, not to mention effectiveness of, other resources that make up farming systems, or even to the adequate preparation for the agrarian reform beneficiaries (ARB) to effectively use the acquired land.

At the time that CARL was enacted, smallholder farmers had to depend on off-farm work to materially supplement their income. It was not unusual for this source to exceed the income from the land. With CARP, the number of smallholder farmers naturally increased, thus increasing the importance of off-farm income.

This off-farm income source is largely employment in the upstream and downstream **employment generators** of the **agribusiness system**. These phases cover, in the upstream, enterprises that supply such production inputs as fertilizer, farm chemicals, planting materials and animal stock, farm machinery and implements, research and development, and many other inputs to agricultural production. Downstream, we have harvest and processing, warehousing and transport, and marketing. These are all employment generators.

Not only did the authors of CARL miss out on other major resources, they forgot that by and large the beneficiaries were not prepared to go on their own — not individually — worse, not communally. This is perhaps the deepest of ravines in the path of successful agrarian reform. The Department of Agrarian Reform has made laudable efforts towards forming farming communities through the creation of *agrarian reform communities* (ARCs), but between organization development and business development is a journey of many years.

DAR has in fact demonstrated the efficacy of enterprise development through organization development in its FAO-assisted project, *Sustainable Agrarian Reform Communities – Technical Support to Agrarian Reform and Rural Development*, begun in 1995. This project demonstrated the efficacy of organization development as an entry to enterprise development. DAR's experience also drove home the lesson that "there is no one ideal approach towards establishing linkages or business arrangements, considering the wide diversity in terms of specific requirements of agribusiness companies, corporate philosophy in relation to small farmer groups and business strategies." I will show later, however, that the farmer groups become agribusinesses themselves.

An analysis of the AFMA paradigm, not surprisingly, reveals an agribusiness structure.

### 3. Exacerbation from WTO

It is evident that in the environment of agriculture today, to survive the smallholder farmer needs to learn and practice agribusiness management. Very little reflection will show that this is a time-consuming learning process. The situation is worse for the new landowner-tiller. Compared to the smallholder farmer, the new landowner-tiller (ARB) is likely to be starting from a negative position. A landless farm worker hardly knows even farming per se if he has been assigned to specific and narrow duties such as weeding or fertilizing or harvesting. So even as he learns farm management he has to also learn farming itself; and after farm management, agribusiness management.

More than transforming into an agribusiness man, both smallholder farmer and ARB have to learn how to consolidate resources and manage the consolidation. Some of the critical resources are not accessible to individual farmers, such as integrated pest and disease control, irrigation, farm to market roads, credit, industrial markets, and many others. What

this shows is that as the farmers and ARBs are learning agribusiness, they are also learning how to organize themselves not only into communities but also appropriate business organizations.

The appropriate business organization is not necessarily a cooperative. In fact, very often the cooperative has shown itself to be inappropriate for business enterprise. This poor cooperative performance suggests the generation of some kind of a hybrid between a cooperative and a corporation. We see an even longer gestation period, and that gestation period ended seven years ago.

Shift from the domestic market to export and the problem becomes compounded. There are the added dimensions of larger volumes, stricter specifications and consequent tighter quality control and higher levels of rejection, price-depressing competition, etc. Retreating to the domestic market will not be a viable alternative since there will be very little difference between the two markets once tariffs disappear. Thus foreign suppliers, with all of their advantages of scale, superior technology and lower input costs can drive local producers out of the domestic market. In fact they are already doing that even now when there is still some residual tariff protection in place. When smuggled in, or under *minimum access volume*, local products have capitulated. We are looking at zero to three percent tariffs.

And so, even as the new landowner-tiller is learning to stand and stumble, WTO is telling him to run with all his might, against "Olympic" grade foreign sprinters and long distance runners. Many of our aspiring competitors have miserably failed in basic organization, not to mention organization for business enterprise. As indicated above, our individual farmers will be standing far from the starting block in this race, their organizations even farther. Before they can reach the starting line, they will be eating the dust from the foreigners.

### 3. Agribusiness

This is the direction for agriculture-based development. In fact, as shown above, in a liberalized market economy we have no choice. For better perspective, let us look at an agribusiness definition suitable to this situation.

Given the lack of time for gestation under a WTO environment, I suggest a **two-step approach**. The central idea in this approach is to develop a working relationship between producers of farm goods on the one hand

and users on the other. The kind of relationship can go from simple open market supply modality, to contract growing under simple or complex arrangements, and where advisable, all the way to a joint venture modality. The joint venture's scope of operations could cover single phases such farm production or the whole range of the agribusiness system.

As one can gather from the foregoing sections, in most cases the farmers are not able to enter initially into a good partnership from lack of social preparation and business experience. One therefore has to be satisfied with starting with a modicum of basic organizational maturity, and work out the working relationship from there.

Still this would be faster than for the farmers to go on their own in building up business expertise. The bottom line is to accelerate this gestation by first restoring the synergy between land and labor on the one hand; and capital, market and management on the other; and to use this synergy as an accelerated on-the-job learning experience for the farmers – as an **initial step**.

But this time it must follow another paradigm. The new paradigm posits a partnership between the farmers and agricultural companies, where the farmers contribute at least land and labor while the companies bring in the markets, appropriate technology, credit, and management. The farmers may also contribute assets at hand, such as farm machinery, harvesting and processing equipment, and other facilities.

To be a real partnership the farmers have to work together, as an organized business group, rather than as individuals. Needless to say, these farmer groups have to be brought “up to speed” business wise, to level the playing field to the extent possible. The prospective business partners do not want to deal with too many parties because of the time demand, complex organization, and vulnerability to conflicts inherent in such a fragmented relationship.

Moreover, if the business firms accept the complications and opt for this type of relationship, the disorganized or inadequately organized farmers are further disadvantaged in an even more steeply uneven playing field.

On the other hand, the companies also have to learn to deal with a situation where they do not have complete control, as they may have had in the past as agricultural companies. Now they will have to plan together with the farmers who now control at least land and labor. This is especially true in a joint agribusiness venture, but so even in a looser type of relationship such as contract growing.



Conceivably the business firm partners could enjoy near pre-CARP conditions in a straight lease of farmlands. But such arrangements are frowned upon by DAR, and may inherently be less advantageous for the farmers in the long run, thus suffer from lack of sustainability. However, the lease modality may precede contract growing as the farmers' organization matures, and even end up as a joint venture.

Given the discussions in the earlier sections, the low incidence of organizationally mature cooperatives and other forms of farmer organizations will limit the applicability of this approach. But success breeds success. Neighboring farmer groups watch one another closely.

The next step would be to gradually wean the farmers from this synergy until they are able to carry on by themselves, but still maintaining some suitable business relationship with the business firms, such as downstream processing and diversification into related lines. This is where relationships between equals begin to take place.

**All this preparation/development takes time, and money.** Because of the exigencies of government service, which discourages overtime and weekend work – when most of the organizational development work takes place – only private sector can perform all this. However, this is clearly not a moneymaking or even self-liquidating enterprise. Government support will therefore have to come in. But this is not really a subsidy since it is the government's job to do it, and therefore part of governance. In fact, **the enterprise could spawn a career: agribusiness management developer.** As mentioned above, the problem of credit may be attenuated by the presence of a business partner. Banks tend to look kinder at loan projects where there is a "big brother", particularly if well known in the business circles.

**Philippine Agriculture 2020: A Strategy for Poverty Alleviation, Food Security, Global Competitiveness, Sustainability, Justice and Peace**

**THE NUEVA VIZCAYA EXPERIENCE**

**Rodolfo Agbayani**

**Congressman, Lone District of Nueva Vizcaya**

I would like to thank the organizers particularly the NAST people for having invited us from Nueva Vizcaya to share our experiences in managing and utilizing its uplands. Nueva Vizcaya is 265 km north of Manila and the first province you will encounter in going to Cagayan Valley. Nueva Vizcaya is a landlocked province bounded by six provinces, Isabela, Quirino, Aurora, Nueva Ecija, Benguet and Ifugao. The province of Nueva Vizcaya is the watershed of the big dams in the surrounding provinces, and thus, Nueva Vizcaya has been assigned the role as the watershed haven and an outgrow forestry hub by the Regional Development Council of Region 2.

This morning, I will present to you the agro-forestry activities we have conducted in the province of Nueva Vizcaya. In 2000, our province won 3<sup>rd</sup> place in the *Gawad Sapat Ani* which gave us a price of PhP 25 M which we used in starting the agricultural terminal in Nueva Vizcaya. The province of Nueva Vizcaya consists of 437,000 ha, 80% of which or 349,000 ha are classified as forest zone. Of this classified forest zone, 50% of the total land area is classified as critical water shed and 30% is production area.

In the 1980s, Nueva Vizcaya had 86% forest cover, which has been reduced drastically to 25% or 87,000 ha and of the watershed, 75% of the forest are without trees. The alienable and disposal lands are about 88,000 ha or 20% of the total land area of Nueva Vizcaya. The 88,000 ha which are alienable and disposable consist of 26,000 ha fully-irrigated rice lands and 5,000 ha rain-fed, 20,000 ha potentially-irrigated ricelands and vegetables, banana lands, 5,000 ha corn lands, and 32,000 ha settlement which are for residential, commercial infrastructure, roads, irrigation and for other purposes.

Nueva Vizcaya has 15 municipalities and 275 barangays. It is a lone district. We do not have a city yet, no first class municipality, only one

second class and the rest 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> classes. In the year 2000 census, the population stood at 367, 000. The poverty incidence in 1992 was 45% and when I assumed the governorship, it was 52% and most of these are in the upland communities mostly belonging to the indigenous tribes.

Migration of our population in the upland resulted in marginalization of forest lands through kaingin and other activities in the forest land. Thus, heavy downpour or rain or typhoons would result in flash floods in the low lands, with erosion of the riverbanks, widening of river beds, damage to agriculture, residential and commercial properties and infrastructure projects. This has cost a lot of expenditure on the part of government. There is low productivity of agriculture in the lowlands inspite of increased cost of production.

What interventions have we made in the uplands? We started first with the hill of about 120 ha in the lowlands, the Bangon Hill which is owned by the State College, now a university located at the capital town of Bayombong of our province. We first negotiated with the state college to lease 50 ha of that hill. It was barren and a grazing land; grass fire occurs every now and then especially during summer. Squatters had also settled on parts of the hill. The state university was just too glad to lease it to the provincial government at P1.00 a year as rental for 25 years. So what did we do? We subdivided this into one hectare each then invited civil society and different government agencies to sublease one hectare each, and plant it with fruit bearing trees. We started with P200,000 granted by Sen. Alvarez and the condition was that they are going to harvest the fruits of whatever they plant there during the period of 25 years.

The second intervention we made was with the Barobog watershed. We asked the Department of Environment and Natural Resources (DENR) to devolve the 439-ha Barobog watershed to the province of Nueva Vizcaya although in the Local Government Code, the municipalities and not the province can manage the watershed. Since we were supplying the potable water of two municipalities, Bayombong and Solano, the two biggest towns in our province, we were allowed to manage the said watershed and it is supplying also the irrigation water in seven barangays and municipalities of Bayombong and Solano. This is a case of partnership between the provincial government and the stakeholders or the occupants. When DENR was administering the watershed, they had difficulties in containing the migration of people to the watershed. What did we do to prevent this? We subdivided again or we recognized the occupants of the watershed and we granted to

them a Memorandum of Agreement assuring them that if they will make good in managing the respective areas in accordance with the development plan which they have prepared with the assistance of the provincial government, then they can have it renewed for 25 years, otherwise they will be evicted from their place. And we, therefore, were able to convert the squatters or the occupants into land managers and this made them very proud to be even called in the Memorandum of Agreement as land managers, instead of being squatters who are chased by the DENR.

The third intervention we made was in the Lower Magat Reforestation Project which is an example of a partnership among the provincial government, the DENR and the stakeholders. This covers 24,000 ha located in two municipalities with 24 barangays and a population of 19,000; the area is heavily settled with squatters. We granted the Memorandum of Agreement to occupants to manage this area which is the watershed of the Magat Dam. We also issued this instrument to the occupants with a Tree-for-Legacy which gives the right to tree planters to harvest provided they are going to protect the natural grown-up trees in the area which is allocated to them, and this covers the whole province of Nueva Vizcaya.

Let me mention some of the impacts of these projects. They have provided production of forest products and conservation of natural grown forest trees, and allowed the rehabilitation of denuded forests. They have also resulted in revival of springs. What lessons have we learned? That there is a need for continuing DENR's expertise in resource management, partnered with LGUs capability in the delivery of basic services and instilling people's management as a practical strategy in national resource management. The DENR provides the expertise while the local government units provide all basic services needed by the occupants. Thank you.



## **A STRATEGY FOR POVERTY ALLEVIATION, FOOD SECURITY, COMPETITIVENESS AND SUSTAINABILITY:**

### **OPEN FORUM**

**Dr. R. Gloria**, former DOST Secretary: I would like to congratulate very sincerely and very heartily the NAST for putting up this document the PA 2020. This document is a very good, strong guidebook for the next secretary of agriculture and of the Philippine Government but a word of caution. I have stayed in Indonesia for 11 years, helping Indonesian agriculture. They developed a strategic grand design for agricultural development for Indonesia, of what agriculture would be in Indonesia in the next 20 years. They obtained money from the World Bank, from ADB and they got the best experts from the CGIAR and other various scientific institutions in the world. What happened. When the plan was submitted to Indonesia's Minister of Agriculture, the Minister said —thank you very much; it is good on paper, but it is very difficult to implement. With the PA 2020, let us all work to have this but we need to be sure that our plans to achieve PA 2020 are doable.

However, in 2020 I will be 80 years old. It will be good if we hand landmarks after 5 years, 10 years and then 15 in 2020 which we can look forward to. Again, my thanks to NAST. I also would like the group to study very well the case of rice and corn. I know that if you want to be poor, plant rice and corn; but if you want to have a better life, you plant commercial crops. As a Mindanaon, I hope that Mindanao will be involved in the planning process as we go along because Mindanao is the food basket of the Philippines.

**Academician F. Campos:** I will be very brief. I am going to comment on the speakers and here are the key words that I would like to bring out. The word “business-size”. This was talked about by Secretray Yap, “business-size” the farmer. What does that mean? I'll tell you the farmers very often would say, “we are the ones who produce food, but it is the middlemen who become rich.” So it is the middlemen whom we “business-size.” For example, a basin of fish is sold initially at PhP 25 by the fisherman and is sold at PhP 50 by a middleman in the same place.

Regarding the CARP program, what happened to the CARP program after the Masagana 99. After that program fizzled out, many of the farmers given land titles sold the properties and the title because the farmers say they do not have the money to buy fertilizer and so on. Regarding eating brown rice, although it is high in nutrition, poor people prefer to eat well-milled rice. They say that they do not have money to buy food so if they have well milled or white rice, they just add fish sauce and a little oil and the rice will already be good to eat!

I would like to comment on Dr. Clarete's reaction. He says that we have to look at models that already work and let us improve on those models. I agree with him, let us adopt technologies like the Japanese and Koreans who dismantled and studied American cars, and introduced innovations into the same cars! Last but not least, I would like to congratulate politician panel speaker Congressman Bayani for the projects he has established in Nueva Vizcaya where they have good roads and large areas planted to vegetables, and most of corn and rice are coming from there. One last thing, I would not like to dampen your enthusiasm for this project but I have heard all of these some 50 years ago. Thank you.

**Dr. R. Labadan** from the private sector: By 2020 I will be 85 as most of the people here in NAST. Let us all be practical. Can we fast track the PA 2020? What do we need to research on? The next question is, as Dr. Gloria said, if you want to be poor, plant rice and corn. I am writing a book about coconut and it's a revelation that coconut is not the tree of life, the title of my book is "The Philippine's Money Tree". Everything in the coconut can be used to make money. So before doing more research, let us commercialize the research results that we already have. Thank you.

**Academician RF Abarquez, Jr.** We have been talking about distributing lands, what is the statistics, what is the track record of land that has been distributed. Was the original purpose for the distribution achieved?

**Academician EQ Javier:** The total land under the Dept of Agrarian Reform which are the private agricultural lands was 4.2 M ha target and out of that 4.2 M, 800,000 ha are left. Most of the private lands that have been reformed are the smaller land holdings. The remaining 800,000 ha are the bigger sugar and coconut lands. So the irony is, we broke up the lands which are already small, but now we have the remaining 800,000 ha and unfortunately, there are some voices that we should stop agrarian reform now. We end up in a situation that you have land reformed the small ones and left the big ones.

But this does not answer the question. The question is— was the intention to divide the land achieved? That is the issue.

**Academician RD Guerro III:** There is a study that shows that the beneficiaries of land reform are better off than before. And for most of them, the immediate benefit was the education of their children. However in the matter of productivity, this is a big question mark, because in the absence of supporting measures the land transfer by itself would not necessarily lead to higher productivity. But I think you have more peace and order in the countryside. So if you compute how much army resources we would have needed to keep the countryside peaceful, then perhaps that should be part of the equation. But clearly, the beneficiaries of land reform will have to be provided assistance. They are now being organized into agrarian reform communities and out of the 1600 or so agrarian reform communities have been established and 800 of them have been supported mainly by lateral grants. So land reform must be accompanied by inputs to help the land holders make their new assets more productive.





## **Highlights of Agro-Industrial Cluster Analyses**

### **SWINE, POULTRY AND CORN INDUSTRY AND PASTURE RUMINANT INDUSTRY CLUSTERS**

**Javier P. Mateo**  
Technical Director, Agri Specialists Inc.

First of all I would like to thank NAST for the invitation to be one of the panelists in today's plenary session. I would like to limit my reactions and comments on the analysis done on the two industry clusters—the swine, poultry and corn industry cluster and pasture ruminant industry cluster. The strategic plans for both swine, poultry and corn industry cluster and pasture ruminant industry cluster were very well described and discussed in the papers presented. They were tailor-made so that these industries can become more competitive in the line of global concern as well as address the need for more meat and dairy products from ruminants and meat from swine and poultry as a major protein food for the increasing Filipino population.

The strategic direction of the cluster as well as the planned targets, the action programs, implementations and monitoring requirement are given in the said paper. However, what was lacking was the financial budget needed to implement and monitor such strategic plan. I believe this important concern must be embodied in the strategic plan as nothing concrete could be accomplished without this monetary consideration in play. Government should pledge its support for the continuous implementation of this plan and the private sector should involve itself in this plan to help the government.

Agricultural development is very elusive and this can be attributed to low investment in agriculture. RA 8435, the Agriculture and Fisheries Modernization Act (AFMA), intended to provide additional PhP 20 billion per year, over and above the yearly budget of the Department of Agriculture. This could have been a major source of funds to be allocated in the modernization of agriculture. But in reality, funding for AFMA fell short of the expected PhP 20 billion.

How to get agriculture moving? Government must be serious in the implementation of the provision of AFMA to improve the production environment i.e., infrastructure like construction of bigger roads, bridges, slaughterhouses, animal health and quarantine facilities, breeding farms and the more sophisticated and ambitious port facilities and railway facilities to facilitate the delivery of the products from the point of production to the point of consumption. The provision for post harvest facilities can significantly minimize losses reported to be around 30% in corn production. With the projected increase in both production and demand for poultry and swine products, the requirement for corn will similarly increase. Presently, about 5.5 million metric tons of corn is needed to meet the requirement of our poultry and swine industry. The present corn production is not sufficient to meet this requirement, such that there is a shortage of about a million metric tons of corn and in order to remedy this gap, government imports corn or corn substitute like feed wheat. Another area in which government can help in the swine and poultry industry is in the area of rationalization of tariff and this will affect the production of poultry and swine. The importers of feedstuff, feed additives and feed supplements needed for production of complete meats of swine and poultry are having difficulty with the Bureau of Customs, because of tariff application. The review on the classification of feed stuffs, feed additives and feed supplements is now in progress at the Animal Feed Standardization of the BAI in the Department of Agriculture. The results of this review will be used by the Bureau of Customs as a guide for tariff application.

At present, there is very little acceptance by the Filipino consumer for carabeef as a substitute for the more expensive cattle beef as food. There should be an aggressive campaign to promote this type of meat to the Filipino consumer. Not until we have successfully addressed this limitation could we succeed in inviting more business participation in this industry.

I believe that all agribusiness plans are worthy enough for us to spend our time discussing these problems and possible solutions. However, most plans made in the past, ended up as files with no concrete actions. This I believe should not happen with these plans for swine and poultry and corn industry cluster and pasture ruminant industry cluster. These may be the only hope left for our animal industry to prosper in the future. Therefore, we, in the private sector, shall give our support to this endeavor and hope for the success of such strategies and action plans.

In conclusion, with the projected demand of 2.865 million metric tons of corn, 1.473 million metric tons of chicken meat and 429 thousand metric

tons of chicken egg by year 2020, the current production must at least be doubled. This is critical to the attainment of our national goal, of eliminating poverty and improving the quality of life by providing adequate, safe and nutritious food for our Filipino people. We, in the poultry, livestock and related industry sectors, must join hands to achieve our vision of a progressive nation, where protein sources are accessible, available and affordable to the present as well as to future generations.



## **Highlights of Agro-Industrial Cluster Analyses**

### **THE FISHERIES AND AQUATIC RESOURCES**

**Felix R. Gonzalez**

**Secretary General**

**National Chamber of Fisheries and Aquatic Resources**

I would concentrate my comments on several most important issues that I see in the development of Philippine Fisheries. But first, may I say that the Bureau of Fisheries and Aquatic Resources (BFAR), seems to be not included among the agencies which crafted the strategic plan. The draft considered the changes in the alcovial system, natural resources system and the social system. What about the cultural and traditional considerations in framing the plan? The draft plan recognizes agriculture, and of course, this includes fisheries, as a business and that the lead role would be given to the private sector. I think the word "would" should be changed to "should" because of the compelling role of private sector.

The draft plan recognizes the importance of harnessing of the coastal areas for aquaculture and marine culture production with emphasis on the social aspects of coastal areas development. May I also stress that RA 8550 or the Fisheries Code of 1998 was not considered nor mentioned substantially in the draft plan. This Fisheries law touches on a wide range of fisheries program, policies and projects. Among others, the draft plan does not merely focus on productivity but it recognizes the importance of post harvest and marketing. A strong point towards making changes in agriculture and fisheries is the recognition of transparency and accountability in the Department of Agriculture. Integrated research and development in extension systems must be given the highest concerns not only in paper as we have witnessed during the last decades. The fishing industry of the Philippines has lagged behind Thailand, Vietnam and Indonesia. Before, we were number 1; now we are last in Southeast Asia.

In terms of involvement, I noticed that BFAR as an organic agency involved in fisheries was not included in the writing panel nor mentioned as sponsor maybe because no scientist from the fishing industry is a member

of NAST but we are very happy that Philippine Council for Aquaculture and Marine Research and Development (PCAMRD) Executive Director Dr. Rafael Guerrero and UP Marine Science Institute Director Dr. Eduardo Gomez are members of NAST and they have helped a lot in the framing of the plan. It also appears that BFAR was not listed as a stakeholder or a support agency among the various agencies noted in the main report. I believe that the fishing industry sector needs to be more involved in the framing of PA 2020.

It appears that in the PA 2020, fisheries were not given substantial considerations. Capture and culture fisheries were treated as a sub-item only in the agro-industrial cluster. References are, of course, an indication of the depth of analysis of a chosen subject. I noticed that the main report sorely lacked published materials in the area of fisheries. I am aware that there is a huge body of literature dealing with various sectors of fisheries, e.g., in aquaculture development, in marine culture fisheries and in municipal fisheries.

Here are some broad comments on the presentation on capture fisheries and aqua culture. Most data used were those reported as of 2003 which did not clearly show the behavior of incremental growths, in production, labor, income, government budgets, exports, infrastructure and others. There was no attempt in the plan to compare the growth of protein sources either from animals and fish. The comparison will allow the planners to discuss the sources that may not be able to sustain growth. Fish as a source of fish meal, may not sustain the growth of livestock and poultry in the next ten years. There is therefore a need to plan for the development of protein substitutes. I hope to see the plan with the yearly projections on increased production, changes in per capita consumption, percentage contribution of each of the species or group of species, employment and others. The yearly projection will allow us to detect behaviors in the growth of various aspects of the industry.

What will be the effect of the lack of food sources from fish as a result of closed seasons, limited access and regulation on the utilization of fishing vessels. According to RA 8550, abandoned, unproductive and underutilized fish ponds now estimated at around 200,000 ha must be reverted to their original mangrove state. Aquaculture must then be further developed because of the dwindling productivity and income from marine fisheries. The numerous provisions listed in the Philippine Fisheries Code of 1998 should now be reviewed if we want the fishing industry to support the

growing needs of the population towards the immediate decade. Most of the provisions are supportive towards conservation but are against productivity. Where shall we go? Shall we support conservation while we lack food for the stomach? These are the things that the planners should look into.

The following must be considered in framing PA 2020: (1) creating a department of fisheries to give impetus and support to the growing importance of fisheries. In our neighboring countries like Thailand and Indonesia, fisheries are at the level of department. (2) Opening up of our fisheries beyond the 20 km limit towards the 200 mile economic zone. In the Philippines, we only think of our own coastal fisheries. It is high time that we look into the development of international fisheries beyond our 200 mile economic zone. (3) The numerous provisions listed in the Fisheries Code should now be reviewed if we want the fishing industry to support the growing needs of the population. Allowing municipal fishermen to use more than 3 tonnage gross for them to qualify to fish further beyond 18 km and thus promote expansion and growth of income. (4) Full implementation of the National Fisheries Research and Development Institute (NFRDI) to answer the growing needs of R & D in fisheries. Sometimes the fishing industry says that PhilRice is to rice, then NFRDI should be to fish to speed up the developments in R & D in fisheries. (6) Absentee Fishpond Lease Agreement holders should have their lease automatically cancelled by the government and should be forfeited in favor of the government and dispose to willing investors, to speed up the strengthening of the municipal fisherfolk. (7) The Fisheries Aquatic Management Councils should be set up and be operational in all coastal municipalities. (8) According to the Philippine Fisheries Code, BFAR should prepare and implement a comprehensive national fisheries development plan for long term sustainability. This should have been done in 1998. Up to this date, BFAR has not yet started preparing the plan.

The fishing industry capture fisheries and aqua culture are waiting for guidance from the government. Is there room for further markets? Investments? Where will they go and expand? What species shall we develop? What will be the concentration of public investments? To prepare for the expansion of the fishing industry under RA 8550, government has to create financial schemes. I would like to enumerate these schemes to give us an idea that the government has already set all the guidelines for this country to really develop its fisheries. These are (1) the Fishery Loan and Guarantee Fund of P100 M to finance the development of the fishing



industry; and (2) the Fishing Vessel Development Fund to enhance the building and acquisition of vessels to be administered by the DBP at P150 M yearly for 5 years. The fund is critical because our fishing vessels are aging and we need new and higher capacity vessels to address the potential increase in growth.

I hope the Department of Science and Technology through the PCAMRD and the Department of Agriculture through BFAR will join efforts to work out a workable fisheries plan with a very clear concern to consider the targets set in the medium term development plan. In the industry level, we have to see a discernible increase in unit productivity annually and an increase in the physical growth facilities like vessels, fish ponds, post harvest facilities and others.

Lastly, while we consider the fishing industry to be still a poor relation of agriculture, more efforts should be done to put fisheries in the forefront with agriculture towards 2020. I long to see the day when Philippine Agriculture 2020 will read as Philippine Agriculture and Fisheries 2020. Thank you.

## **Highlights of Agro-Industrial Cluster Analyses**

### **STRENGTHENING GENETIC RESOURCES AND ENTREPRENEURSHIP**

**Noel G. Mamicple**

Vice President for Quality Control  
St. AgriTech Corp.

I wish to congratulate NAST for coming out with PA 2020. It is a landmark output for Philippine Agriculture. One of the innovations noted was that rice and white corn were clustered as one. Rice and corn were always treated as separate commodities. This is logical because white corn is a staple in Mindanao and the Visayas and their increased production could somehow relieve the pressure for the production of rice.

Another innovation is the clustering of yellow corn with poultry and swine, again very logical because yellow corn goes more to hog and poultry feeds making up more than 50% of feed constituent. So these are two new groupings involving corn. As usual, vegetables as a group is very complex because they range from leafy vegetables to root crops. Sugar cane, of course, stands by itself and so does coconut, abaca and coffee.

The PA 2020 reports follow a pattern starting with the vision for the cluster, goal, objectives and then industry analysis - present state of the industry, costs and returns, and whether the crop is competitive as an export crop or as an import substitution crop. SWOT analysis was also done for each cluster noting strengths and weaknesses. In some clusters, there are proposed activities and/or actions to address some of the weaknesses.

What are my overall comments? First, I agree in general with the analysis for each cluster of crops or group of crops. I will leave to the commodity experts what interventions are needed to address problems in these commodities.

In relation to the goals of PA 2020 namely: decreased poverty, enhanced food, fiber and bio-energy security, improved agro-industrial competitiveness, and improved sustainability of the ecosystem, these goals have two things

in common - increased productivity and production efficiency - regardless of the crop or group of crops. Thus, productivity and efficiency are fundamental goals for development of agriculture in the Philippines.

For productivity to be sustainable in the long term, biodiversity underpins productivity. The 2020 report affirms how rich the Philippines is in biodiversity. In plants, the country has an estimated 15,000 species and that 50% of these are endemic. Somehow I did not read in the documents that this is a very important component of our sustainability for the next 15 years. Thus, my first suggestion is that the 2020 documents must emphasize that conservation of genetic resources is fundamental to our current and future improvements in agriculture. This should be made part of the PA 2020 development strategy through the reinvigoration of the National Plant Genetic Resources System with its nucleus at the National Plant Genetic Resources Laboratory, Institute of Plant Breeding, College of Agriculture, U.P. Los Banos. This point should be explicitly stated in the documents considering that present conditions of the Philippine environment are putting pressures on the country's agricultural productivity, efficiency and sustainability due to losses in soil fertility, erosion and loss in biodiversity, among other losses.

The document states further that "technology development within the next 15 years or even beyond should anticipate the technology needs of different agro-industrial clusters to make Philippine agriculture more efficient, more competitive and more profitable to the producers while assuring sustainability of resources for future generations." With genetic resources conservation explicitly stated as a development strategy, the government must devote sufficient resources to maintain and to conserve our plant, animal and other biotic resources.

Another point I wish to bring out is that science-based technology can transform traditional farmers to entrepreneurs. One of the premises in this document is that agriculture must be organized and managed as a business. From the viewpoint of poverty alleviation among traditional farmers, I contend that this could be the case. I would like to cite an experience under the current hybrid rice program in the country.

During one harvest festival of hybrid rice in Laguna, comments of a farmer were very revealing in relation to this point. It took him a long time to try to grow F1 hybrid rice because he was always thinking of the higher cost of the seed. When finally persuaded by the LGU technician, he succeeded with a really good harvest compared to his previous crops. The

farmer said he began to think not only of the cost to grow rice but was now looking more at how much he could potentially get from his crop! A big step in the transformation towards entrepreneurship.

Hybrid seed as an example of science-based technology has been established and has boosted the local corn industry as well as the vegetable industry. In rice, the technology is spawning a local hybrid rice seed industry. And this development is pushing modernization of rice production in the country as well. Hybrid seed companies are expanding their markets and have gone global in the region. Indeed, science-based technology could be a key to organizing and managing agriculture as a business.



## **Highlights of Agro-Industrial Cluster Analyses**

### **FOREST-BASED INDUSTRIES**

**Florentino O. Tesoro**

Former Undersecretary

Department of Science and Technology

I find the analysis of the forestry cluster very comprehensive and I have picked out a few items I will comment on. Firstly, the strategic plans suggest that in order to be able to supply sufficient raw materials to forest-based industries, we should improve the remaining second-growth production forest through assisted natural regeneration timber improvement and enrichment planting. It has also been suggested that as a target, we should develop 400,000 ha of tree plantations, 5,000 ha of bamboo and 20,000 ha of rattan plantations. The private sector can best do these things. However, in fact, in the Philippines, many more plantations had been developed by government. It should be the other way around. There should be more plantations developed by the private sector. However, private sector has not been investing in plantation developments mostly because of uncertainties with respect to policies of the government. Moreover, the areas for development have not been properly or fully identified. There are conflicts in tenure of areas and there had been very little incentive or assistance provided by government to the private sector in the development of forest plantations.

From 1991 to 2001, the developed plantations in the Philippines totaled about 520,000 ha, 62% of which was developed by government mostly in the protected forest areas. Thus, it would be difficult to harvest these plantations. We should provide incentives in plantation development. In 1974, Chile decided to go in an all out plantation development. That was about the same time that the Philippines approved the Forestry Reform Code. However, Chile has provided a lot of incentives such as 75% of the cost of plantation development, which include development of fire roads, fences, and pruning subsidy. They prune the trees while they mature and thus, the

stand of the trees becomes even better with age. They provide 30 years tax exemption on the use of the land and no tax payment on the plantation prior to the first harvest. They give a direct grant of 10% tax credit on equipment for producing export products and a direct grant of 10% of gross export receipts. Their incentives and subsidies are certainly large and attractive. Chile now has 3 million ha of plantations and they are one of the countries exporting plantation-grown wood.

If our government cannot provide this type of incentives, at least private sector should be provided with some guarantees. While private sector wants to plant trees, they cannot obtain loans to do so. What we can do? I repeat a recommendation I have given before—we should establish a guarantee fund. Government should establish a guarantee fund and the private sector can take a loan from a designated bank and that loan could be guaranteed by the guarantee fund. Many government policies constrain plantation development by private sector. Another policy which has been corrected by former DENR Secretary Elisea Gozun is that if you plant trees in your own backyard, you cannot cut the tree unless you get a permit from the DENR. This has been changed. You can now cut the trees you planted but you will need a transport permit to transport the log. With DAO 2004-4, former Secretary Gozun deregulated trees planted in private lands. If they can permit trees planted in private lands to be cut and transported, why can they not extend this permit to trees planted in government lands. The government is probably afraid that this will be used in illegal cutting. But this can be prevented. Since there are only 622 active sawmills, all government has to do is post a staff in the sawmills who will then see to it that no illegally cut logs enter that plant. This will also eliminate the problem at checkpoints. Let me share with you a story. We were running a processing plant in Zamboanga; we contracted to buy gmelina from a tree farmer at PHP 500 per cubic meter. When he delivered the wood, he asked for more money because he had paid more than 10% of the cost at the checkpoints.

With respect to the development of 20,000 ha of rattan plantations, DENR has a policy that rattan permit holders pay PHP0.50 for every linear meter of rattan. They call this rattan deposit. The problem is that this rattan deposit, which is supposed to be used to establish rattan plantations, goes to the national treasury and is difficult to retrieve. What should be done is to cancel the permit of these permit holders if they do not establish rattan plantation commensurate to the amount that they have paid for every linear meter that they cut from the forest. For bamboo, we have 5,000 ha but this is small considering the 15% growth rate of the bamboo furniture industry.

One of the targets of the Forestry Industry Cluster is the rationalization of forest-based industries. One of the proposed activities is to provide fiscal incentives for forest-based industries for equipment, rehabilitation and retooling. Many years back, forest-based industries enjoyed some incentives for importing machineries. This incentive was removed two years ago. If we can have this incentive back and if we work for the inclusion of the wood-based industry in that omnibus incentive package for industries, the cost of importing machineries for retooling the forest-based industries will be considerably reduced.

Furniture and handicraft exports are the two bright spots in forest-based industries. Furniture export increases at the rate of about 12% per annum. The main problem of this industry is the supply of raw materials. The expansion of plantation development in the Philippines particularly in areas that can be utilized for furniture will be most beneficial to this industry. In fact the furniture industry has developed product lines that they have been promoted abroad, with the use of gmelina as the species. The housing sector is still one of the big markets locally for lumber, but the problem is that we have lost the mahogany type of lumber species and the architects and design engineers are shying away from the use of wood because the available wood does not have the appropriate properties for structures. Presently, a new technology called machine-stress graded lumber is now being piloted in the Philippines. This was developed by DOST and the Association of Structural Engineers has endorsed the use of machine-stress graded lumber. A lumber company in Cebu is selling the machine-graded lumber.

The forest-based industries have been relying on industry associations such as the Philippine Wood Producers Association, the Chamber of Furniture Industries of the Philippines and the Philippine Chamber of Handicrafts to fend for themselves against the policies of the government detrimental to their business. I propose that the PA 2020 should support the establishment of a Philippine Forest Industry Development Board. In Malaysia, they have the Malaysian Timber Industry Board, which provides assistance to the timber-based industries. They work on policy development with government and develop local and foreign markets. They link with capital sources. I believe that our forest-based industries need this board which can oversee and address their needs.

Thank you.





## **HIGHLIGHTS OF AGRO-INDUSTRIAL CLUSTER ANALYSES**

### **OPEN FORUM**

**Mr. Ed Lim:** First of all I believe the setting of the year 2020 as the target is too far away. So I believe first of all, perhaps a target of 2010 for the achievement of self-sufficiency in agriculture particularly in rice and corn, fisheries etc. the agro-industrial clustering is a major strategy to achieve the goals set out by this conference. However, the concept of clustering has to be tied directly to the market chain. For example, if you are talking of rice, we must relate this to the rice millers and the wholesalers. We have to cluster them as one chain. For corn, we have to cluster them to the livestock raisers and feed millers. I am talking about yellow corn. And for coconut we have to tie that to the copra processing plants and the processors of various crops that are going to be raised under the coconut trees. This could be as wide ranging as livestock raisers or exporters, processors or food processors, mango, calamansi, dalandan whatever as well as food, crops, vegetables. And for fisheries we have to cluster them with the market, the fish culture, the fish cage raisers, ranching especially the market where do we market this.

Now the government's role should be devoted to providing incentives because it is really the business sector, the private sector that will move this project quickly. The incentives have to come in terms of actual realistic financing. As now, Landbank, Quedancor etc give a maximum of P16,000 per hectare for rice growing. How can you plant rice for P16,000? It's impossible. For corn, can you grow corn for P12,000? So you need a realistic amount that will cover also the livelihood of the farmers during the time of the gestation of these products.

Government should do planning and zoning. We have 3 million hectares of rice today but if we double our production of rice, we'll probably have an excess of 2 million hectares of rice. The same thing with corn, 3 million hectares at 1.8 tons per hectare, but we can do 6 tons easily. For copra of coconut, we have 3 million hectares but if we doubled coconut production we'll have more than enough for our oil mills. And now you have an excess of 4 or 5 million hectares which you have to plant on. What do we plant there, how do we process, export or market this? I think this is a very crucial point for this conference to consider. Thank you.



## **Infrastructure and Support Services for Philippine Agriculture 2020**

### **ROADS, PORTS, IRRIGATION AND MECHANIZATION**

**Proceso T. Domingo**

Administrator  
National Irrigation Administration  
Department of Agriculture

Let me focus on the important infrastructure and support services of roads, irrigation and ports.

Regarding roads, the block allocation formula should be revised to reflect the priority trusts. Block allocation means that certain specific percentages of the budget are allocated to various road activities, for maintenance, rehabilitation, construction of new roads etc. Besides considering population and infrastructure density, accessibility to agro-industrial centers and tourist destinations should be improved. Traditional factors such as rehabilitation of damaged road sections and widening of heavily traveled roads should, of course, be retained.

In addition to the National Irrigation Administration (NIA), there are other agencies such as the Department of Public Works and Highways which receive sizable funds to construct and maintain farm-to-market roads. NIA has constructed irrigation canals and irrigation facilities which have about 12,000 km of farm-to-market roads that serve about 1 million individual farmer beneficiaries. Our study should give some emphasis on the farm-to-market roads for the interest and benefit of our farmer beneficiaries. In addition to roads which service the more highly populated areas, roads that lead to tourist area which are usually not well maintained should be improved to stimulate the tourism industry.

Regarding ports, I agree that to push agro-industrial development, there will be a need to upgrade existing ports and build ports in those without ports. This will enhance inter-island and inter-municipal trade and commerce that will accelerate rural development. This will also create opportunity for the expanded role and business of small shipping lines that the big players

have marginalized. Whenever we go around the country, we see small ports that need maintenance and improvement to better serve our countrymen.

Next is irrigation. We need to accelerate our irrigation development. A shift from medium-to-large gravity systems to low lift pumping systems may not work. The potential distribution considering the service area of low lift pumping system outweighs that of medium-to-large gravity system in development strategy. The pumping system is very necessary but the initial cost is very high to small farmers. Our individual farmers have an average area of 1.8 ha and not all of them maybe able to afford the initial cost of the pump. Moreover, fuel and oil are very expensive, nowadays. The life span of pumps may only be five years or so and the pumps may need some repair and large maintenance cost. However, the goal to attain rice self-sufficiency besides investment cost and buying capability should be factored in. I still think that the small reservoir, irrigation projects that have minimum capacity with proper maintenance of about 80 years will be more economical in the long run and will serve more people in many years. I think that in the Philippines, there is a need for medium to large gravity system of irrigation

About mechanization, to expand the agricultural mechanization level, mere promotion of the advantages of mechanized farming operations will not work. Low mechanization is attributed to low ownership among farmers caused by high acquisition, maintenance, and fuel cost. Farmers will endeavor to obtain equipment, if they could use the time they save for off-farm part-time job. If there are equipment, the farmer may have more time. However, some of them have nothing to do after planting. I would like to suggest that aside from mechanization, what is really important is to encourage farmers to raise animals, for example, carabao, cows, the cattle, not only for farming but also for other livelihood activities.

Next for some minor corrections, on roads, in the PA 2020 document, it was mentioned that there are about 201,000 km of roads but this figure not include farm-to-market roads that serve our individual farmers or farmers nationwide. And as I said, we have about 12,000 km of farm to market roads. And on irrigation, NIA data says 65% irrigated area during the dry season and not 52%.

And lastly, may I point out some minor corrections in the rice and white corn industry strategic plan which says that the NIA budget is PhP 7 billion. Unfortunately, NIA has an actual budget of only PhP 4.1 billion which is

lower than what is needed by NIA for its operations. NIA needs more financial assistance from the government so that it can serve the people better. Presently, it relies only on irrigation service fees as major source of income. Thank you.



## **Infrastructure and Support Services for Philippine Agriculture 2020**

### **AGRICULTURAL ENGINEERING CURRICULUM, MECHANIZATION AND STANDARDS**

**George Q. Canapi**

President

Agricultural Machinery Manufacturers and Distributors Association

My first recommendation is the establishment of a semi-specialized agricultural engineering curriculum. In the past, the normal practice in our industry is to hire agricultural engineers as cadet engineers for 2–5 years. The training is costly, and after the training, these trained engineers transfer to our competitors, or go abroad. Right now, we would like to hire agricultural engineers at entry level efficiency.

My second recommendation is the establishment of a department of agricultural mechanization services group. A recent study mentioned the fragmented mechanization programs of the Department of Agriculture. The commodity-based program of the Department of Agriculture has its own interpretation of mechanization requirements and implementing strategy. The World Bank stated that if mechanization does not keep pace with other agro-technologies, then this fragmented mechanization could slow down development. In the AMTEC section 46, the above concern is addressed and the establishment of a strong agricultural engineering group both at Department of Agriculture and LGUs was recommended.

At present, the Department of Agriculture has a national agricultural engineering coordination office which has to be strengthened and fully supported. Thus, for this purpose, an executive order can be used by the president to address this concern and implement section 46 of AMTEC.

Several specific projects should be planned and implemented.

First is the prevention of the occurrence of saline-intrusion. Our industry, the machinery industry is supplying a huge quantity of irrigation machinery all over the Philippines. According to studies by the World Bank, India,



China, and other parts of Asia have arid regions due to over-harvesting of ground water. In the Philippines, we are experiencing that, in some areas, we have saline-sulfur water coming out from our tubes. I think we should put in place a program to prevent the occurrence of saline-intrusion and to prevent the formation of arid region/areas.

Second, we need a master plan for farm-to-market roads. A more practical name perhaps will be a farm access road because the farm-to-market road is seemingly damaged by its implementation. The implementation is not as we expected.

Thirdly, we need to develop standards for the construction of farm-to-market or farm access roads. I was appointed by the Department of Agriculture to be the chairman to develop standards for farm-to-market road, culvert designs and riprap. The standards when developed can be followed by whoever constructs the farm access road, whether it is the National Irrigation Agency (NIA) or Bureau of Postharvest Research and Extension (BPRE).

Fourthly, credit should be available. There must be a program for high value farm machinery and equipment registration, so that these registered farm machinery and equipment can be used as collateral to acquire additional farm machinery and equipment needed by farmer owners.

A special credit program for agricultural machinery manufacturers to acquire more manufacturing equipment is needed. This is a partial solution to substandard level of manufacturing as mentioned in the paper given to us.

Lastly, we need to strengthen the linkage between and among the stakeholders, the farmers, the private sector and the farm machinery developer to address the continuous mismatch of available mechanization and technologies and farmers. Dr. Cachuela has produced many prototypes in the BPRE but because of lack of funds, these products like the beans player, corn picker, corn planter, etc., have not reached the farmers. I would like to also mention that we have standards in the production of machineries through the leadership of Dr. Arsenio Resurreccion of the Agricultural Machinery Testing and Evaluation Center of the University of the Philippines Los Baños.

We hope that through creativity and resourcefulness, we can establish better standards for agricultural machinery. Thank you very much

## **Infrastructure and Support Services for Philippine Agriculture 2020**

### **INCREASING PRODUCTIVITY BY REDUCING POSTHARVEST LOSSES**

**Ricardo L. Cachuela**

Executive Director

Bureau of Postharvest Research and Extension

As most of you would probably know, the Department of Agriculture has the full mandate in the area of postharvest of grains, high value crops, fishery, and all other commodities that do not fall under processed products.

In fact, PhP 2 billion each year are spent on this program of postharvest. In the 70s, losses were estimated to be 37% in grains postharvest. In the 80s, this was reduced to 23%. Our program is simply to keep on upgrading whatever postharvest technology is available. For high-value commercial crops, we try to reduce postharvest losses in the upland production scheme by promoting the use of the cold chain system.

For fishery, meat, or livestock products, we are also upgrading through the use of cold chain technology which we are doing with private sector. For the grains postharvest, we have examined every operation and we have come to a conclusion that the drying component is the major contributor to postharvest losses. The Philippines is very high in humidity and we have a very distinct wet season. Therefore, we really need to modernize our postharvest system by putting up dryer facilities for rice and corn to reduce not only the physical and quantitative losses but also the loss in the quality of produce. The high humidity makes corn more susceptible to fungal infection which could produce, e.g., the aflatoxin in corn which is transmitted to livestock and to our feeds, and therefore to the food that we eat.

But one major constraint to dryer technology is the use of petroleum-based fuel or energy and thus its cost. Thus, even the traders who are supposed to be the richer sector are still using the highway to dry *palay*. That's one of the reasons that we recommend to put more money into drying facilities.

For high value commercial crops, there are enormous losses at about 40%. For upland vegetables, postharvest losses can be as high as 100%, because of poor handling facilities. These are high value crops and are one of the sectors which can be in a better position than the rice sector. So, we put in the tramline systems as part of the handling technology. We also have cold chain facilities that include pre-cooler, cold storage and refrigerated transport.

In summary, the Department of Agriculture has adopted a bottom-up approach. You probably have heard of the *huwarang palengke* or model market which is basically trying to get the market involved in the supply chain. The strategy is to establish strong market linkages between markets and producers. Market information is fed to the farmers/producers so that they can program their farming to meet the demand. Another strategy is the reduction or even elimination of middlemen. In some areas, there are seven layers that, for instance, for high value crops, the consumer ends up paying so much for the commodity. At the bottom of the *huwarang palengke*, we also put up the food lane. The food lane enables the transport of the commodity, especially perishables, to go straight to the market from the trading post or even the production sites faster without any problems in checkpoints, delays in the highways and poor handling management.

I believe this is where the private sector can come in. If they cluster themselves well, they would be able to reduce the difficulty of handling the investment cost in establishing and using the cold chain and handling facilities such as refrigerated truck and vans.

One of the greatest difficulties of the farming sector is the impact of energy. Postharvest handling will involve energy, especially in the need for drying. This is one of the serious concerns—investment of the government in drying facilities. Finally, it might be worthwhile to think that mechanization and postharvest could be put together. For example, a tractor can do land preparation as well as production, harvest and postharvest handling. Good afternoon to everybody.

## **Infrastructure and Support Services for Philippine Agriculture 2020**

### **LINKING THE PRODUCTION SYSTEM TO THE MARKET**

**Academician Ceferino L. Follosco**  
Chairman, Follosco Group of Companies

The topic that has been assigned to me is to link the production system to the market. This is a very big order. I will just try to go over some major points that have been discussed by the previous speakers and add my own findings and observations.

First: On the infrastructure and support system, hard infrastructure includes the transport network, including land, water and air transport. I think we all know that the quality of our transport system in the country is very poor. According to the survey of the International Management Development, based in Geneva, the Philippines is ranked number 30 out of 30 countries based on the basic infrastructure index and competitive index. This is an indication of the poor state of our basic infrastructure which is found not only in rural areas but also in the cities like Makati, a first-class city where some of the roads are dilapidated and continue to be unrepaired.

What is the impact of poor road conditions on transport logistics cost? There are 4.2 million vehicles in the Philippines excluding those that are "colorum". Around 300,000 of these or 6.7% are used primarily for freight and for the farming sector. The increasing vehicle population is exacting a toll on the roads. Studies indicate that the number of vehicles increase by 9% or 3.7% times faster than the expansion of the road system.

Are you still wondering why we are so congested all over the Philippines, especially in major cities? It is because the road network is not increasing at a rate that is commensurate to the increase in vehicle number and human population. Due to poor road conditions, operating cost of vehicles has increased at an average of 12% per annum.

Let me summarize a few observations of local productivity levels from the production to the market. First, the productivity of our farms is very low compared to other countries. For example, coffee production in the

Philippines is only about 500 kg/ha; in Vietnam, it is 2000 kg/ha. The national productivity level of rice is only 3 metric tons per ha. For corn, we are getting 3 metric tons compared to 12 metric tons/ha in the United States and other European countries. These could be due to more sunlight, bigger mechanized farms, and advantages in their system— from farm to market.

Second: The price of vegetables from Mt. Kitanlad in Bukidnon is only PhP 15 sold by the farmers; this rises to PhP 75 when they sell it to SM, and when you buy it in the market or in the grocery, it is already PhP 125 per kg. This represents an 800% increase from the farmer's price to the consumer, with a total of seven layers of marketing!

Third: Transport of corn from Iowa to Manila is only one-third of the cost of transport from Mindanao to Manila. We have to take note of these weaknesses as we study the clustering system. Fourth: The price of rice is only PhP 5 per kg in Thailand and landed rice in Manila is PhP 12. The price in the market is about P17 to P22. Fifth: Almost all of our agricultural commodities are not competitive in the global market, with the exception of banana, pineapple, mango, seaweed, and maybe a few others. All the rest are not competitive, such as rice, corn, sugar, coconut, etc. Cotton, fiber, machinery and others are uncompetitive in the global market, as analyzed by many in the business sector.

What is common between uncompetitive and competitive sectors?

All those which are not competitive have government agencies dedicated to the development of the particular commodity. Therefore, how did I arrive at this conclusion? You just go over all the agencies of the government and will conclude that the commodities they focus are not globally competitive. Therefore, this is a cause for concern because in other countries those with dedicated agencies are mostly successful in having competitive commodities.

Our total exports to the ASEAN countries are another indicator whether we are globally competitive. Indeed, Philippine exports are very low at about 3%, even with the electronic sector, whose value-added is only about 20%. But Singapore, Thailand, and Malaysia, although much smaller countries, are way ahead of us.

How can we improve our competitiveness?

Firstly, (1) increase crop yields; (2) reduce postharvest losses; (3) repair and construction of various types of irrigation system; (4) improved productivity and quality.

After 50 years as a farmer, an industrialist, a businessman in multinationals and with UN agencies and as a government administrator, I thought that this concept of clustering should be adopted in the country and that we should have our own clustering model, considering the various conditions, and social-cultural aspects in the localities.

I would just like to point out that under the Medium Term Development Plan which started in year 2001, the definition of the clustering approach was adopted by the Philippine Export Development Program. This model is that of total collaboration. It is a total concept that we are following. The agro-industrial cluster Philippine model could be developed as a systems approach considering different conditions, competitive edge, location, climate, and others. For example, let us look at the coconut industry. Value-added products of the coconut lead to a higher value chain. This is the only way we can make the coconut industry competitive because we are no longer the leader in Asia on output or productivity. What is not included here is agricultural diversification. Because the farmer is not making enough money as a coconut farmer, he is advised to plant other crops under the coconut tree. Such crops used with coconut should be carefully chosen since they should be able to grow well under shade.

In the process stream for corn leading towards the production of cattle. Here we need to consider transport cost. The first study I made on this was four years ago which I gave to the Philippine Port Authority, MARINA, Department of Transportation, DBP and others. Unfortunately, nothing has been done about the report. But what we really wanted was to improve the port and shipping sectors. Presently bulk handling is not used in our ports. I have proposed the establishment of a cluster to avoid very high transport costs, starting in Bukidnon and Isabela for the last three years, since the time of DA Secretary Montemayor.

Another example is the milkfish cluster. Only two months ago, I had a four-hour meeting with the milkfish producers in Panay and Iloilo regarding proper clustering of the milkfish industry. As a result of this meeting, the stakeholders in this area will now cluster by themselves. Thus, the value chain will be improved. Before they would ship only fresh refrigerated milkfish, unlike in Sarangani and Dagupan which have been processing milkfish into various products and thus have improved the value chain of milkfish. Traditionally, the producer sells milkfish PhP 50 per kilo and the merchant then sells it at about PhP75, with about seven distribution layers. This is the characteristic of almost every commodity in the Philippines.

About the vegetable industry under the Normin Veggies Cluster in Mindanao, we started to cluster them three years ago but the first cluster was really about ten years ago which we did for the whole region. Here you can see that the market in the farm was P15; this goes up to about P75 when they sell to SM. This is indicated in the cluster value chain that they have been doing by themselves.

I have developed a firm-level model which will really be for businessmen. The segmentation of the various clusters can be undertaken as independent businesses. I would like to point out that we should shy away from too much government support because there is not enough government funds. The business approach should be done as discussed earlier, since we lack product development for various sectors in the Philippines, from the furniture to GTH that makes toys and housewares. In fact, two weeks from now we will have a workshop for various sectors of the economy. Research is done by the UP system in many areas but the development and design portions are not generally pursued. Many researches stay in laboratories and not commercialized. The supply chain, and marketing and distribution can be an area you can decide to do because many of these modules can be profitable enterprises. You can operate on a network basis and start business on various segments of the chain.

Regarding financing and credit, we have divided this into: finance, credit, and collection as independent systems. The other specialized services are accounting, administration and legal. For example, in the outsourcing business, about 300 lawyers were hired by a firm in Manila to do contract review in the United States by the BPOs. We can develop many of these even for agriculture because many of these are really very weak as of now.

The abovementioned segmentation is not exhaustive and can be compressed or expanded depending on the situation. In some cases, product development is part of the supply chain. Supply chain has already emerged. We are using it now to increase the productivity of the supply system. However, I am not using the supply chain alone because I use the so-called cluster approach which includes product development and all the institutional development needed. There are some support and activities that we can enhance especially for farm mechanization, information, common service, common training, common promotions, common distributions, and common business services. Support services, transport services, agricultural services, industrial services, environmental services, science parks, technology

incubators and all of these are models that are working not only in many parts of the Philippines but all over the world. Each of the foregoing cluster segments can be outsourced to achieve economies of scale. The challenge for agricultural engineers, industrial engineers, agribusiness managers is how to manage effectively the whole cluster and its segments that include you, government, research agencies, academe, private sector, and other stakeholders.





## **Infrastructure and Support Services for Philippine Agriculture 2020**

### **OPEN FORUM**

**Dr. R. Gloria**, former Secretary, DOST: Firstly, how would you address the cost of fuel and energy in PA 2020, this was mentioned already? Secondly, we would like to suggest that the writing group and NAST look into the privatization of agricultural extension of the country. Thirdly, we request and suggest that NAST and its scientists volunteer as experts for the Department of Agriculture, DOST, CHED, and DTI at one peso per year. We would like to suggest in the writeup that they should include the role of state universities and colleges in this PA 2020. What is the role of UP Los Baños which is supposed to be the national conscience of Philippine Agriculture? I think the battleground in the next years to come is not the land; the battleground is knowledge. How are we going to harness knowledge, science and technology to achieve poverty alleviation, food security, etc. Finally, I recommend a chapter on the level of investment and strategy on human resource development to achieve our target of Philippine Agriculture 2020. Thank you Sir.

**Academician CL Follosco**: I will try to answer first, and then, my colleagues here can handle the other questions. It's not an easy thing. First, regarding energy and fuel, we expect fuel to become a major problem. Since we are talking of agriculture, we have not tapped our bio-resources and bio-wastes. Rice hull is not being used for fuel; bagasse is now being partially utilized. The use of bio-wastes including agricultural wastes are the concern of all the countries in the world especially United States. In the latest meeting I attended on energy sponsored by the Association of Academies of Sciences in Asia (AASA) in Dalian City, China a year ago, the recommendation was to go into alternative fuel on a bi-breed system. Second, privatization of agricultural extension can be done except for few technologies that are pioneering. The private sector should take over. I learned this when I visited Academicians Emil Javier and Ruben Villareal in Taiwan at the Asian Vegetable Research and Development Center. They said that in Taiwan, even if the research is not yet complete but the product is promising, the farmers and businessmen already take it and complete it

for commercialization. In the Philippines, 20 years after the research, nobody takes it. Either the research is not market-oriented or the businessman is not technology or knowledge-oriented. Third, regarding NAST as volunteers to the Department of Agriculture and other agencies, I think that is now being done by many of the NAST Academicians and National Scientists. I for one spend 60% of my time for free just to help other government agencies and the private sector. However there are only 51 members of the Academy and we cannot be all over for that. Regarding the role of SCUs, with their reduced budget, then they have to be more or less sustainable. Unfortunately, the SCUs are not market-oriented and their products are not attractive to investors, as we have observed in their presentations to the Management Association of the Philippines. Regarding knowledge, the primary concern of the country is on knowledge management, in which we are still very weak. Our engineers are having a hard time getting APEC accreditation. There were only six accepted as the first batch of engineers who were registered in APEC. I hope steps can be taken to further improve knowledge management. If the company is not going to put attention to knowledge and all other industries will not do it, then we will not prosper. We'll just be assemblers of electronics or exporters of overseas workers. Next, the level of investment for HRD is low which should be increased. In my case, even for small firms that I manage myself, I have to create an HRD department because that is the key to our success.

**Unidentified:** In the PA 2020, there is very little or no presentation and analysis on the production of crop, livestock, fisheries, and wood and on postharvest. All of these entail the use of a lot of energy. I suggest a section on productivity and a whole section on energy. How can we be self-sufficient and be globally competitive when we have no control in the external factors at the cost of our production and processing? Thank you.

**Academician CL Follosco:** I think you're right. Energy is our major concern and therefore we'll have to take a look at certain regions of the country where energy can be generated by windmills, steam power, hydroelectric power, etc. We can use manure from the livestock industry for methane gas. You can use hybrid systems that are suitable for a locality. We have biodiesel but it is very expensive compared to fossil fuel. We have tried it and could not justify its use but I heard the one in Romblon is doing alright so I still have to see the economics of that on methyl ester. In addition, I am personally involved in a new technology for the use of crude oil for processing called ozonation. This is in addition to the methyl ester and this will be slightly much cheaper as a fuel additive from coconut.

**Sec. Manuel Lim:** I have good news for you about energy. There are two firms that are now supplying gasifiers for use in dryers and they use their waste from the wastes such as rice hull and corn cob. The other is the Romblon plant which is planning to sell its bio-diesel at P39 per liter.

**Unidentified:** It is known that corn cob is in fact of higher energy value compared with rice hull, although there is more rice hull available than corn cob. But there are other more valuable applications for these commodities than just for biomass applications. A couple of government agencies and also private sector are looking at composites. But we need to go beyond the use of biomass technology to address our energy problems. I think we should advance further to use passive devices, absorb more efficiently solar energy, reduce that five dollar per watt energy conversion to electricity to a more economical scale. Thank you Sir.

**Academician CL Follosco:** Maybe I can add to that. We need to include in our concern that the energy utilized should not contribute to the ozone layer. Regarding gasifiers, we have the technologies in the Philippines. At ITDI, DOST, there are gasifiers which have been installed in many brick plants already in many parts of the country. But maybe, we need to consider other sources of energy. It is interesting to note that there are some companies in Europe that like to put up malunggay farms for the production of diesel fuel and I said how can you justify the economics of it? They said yes, we have done it in Africa and we are going to ask the Philippines to see where we can get credits under the Kyoto protocol. Some Japanese have already come here to improve the systems of the sugar mills utilizing the Kyoto concept/credits. The developed countries are willing to donate the credits to the developing countries as long as we can reduce global warming.

**Ms. Aurora Peralta:** I'm Aurora Peralta from the Fiber Industry Development Authority. I'm one of the writers for the Abaca 2020. We are last in agricultural development among the ASEAN countries, in spite of the brilliance of the minds of the Filipinos. I think George has stated in different words that it is because of our weak political governance. How will you factor politics in achieving the objectives of agricultural 2020. It is not part of the outline that was presented by Dr. Javier, and I think everybody will agree that our plan will result in nothing, without factoring in the influence of weak political governance. Thank you.

**Academician CL Follosco:** The recommendations that I have proposed now consider the social factors which include the political factor. That is

why it is strong for private sector involvement. I mention the fact that the more a commodity is managed by a government agency, the more it becomes uncompetitive. Banana, pineapple, mango and other seaweeds are not managed by any agency. They are very competitive. The point is, what we need are government support in terms of infrastructures and incentives as was done in the case of clustering approach which is in the investment priorities plan under IPP.

**Ms. Aurora Peralta:** If I understand you right, you may have to define the limits to government participation in developing agriculture. How shall we do it?

**Academician CL Follusco:** We should refrain from giving dole outs. The dole out mentality has destroyed the farmers' culture. When you give free fertilizer they just wait, when you just give loans coming from government agencies, they will not pay because they will just say *gobyerno naman yan*. Many of these we have to factor in. That's why it should be private sector oriented like Thailand and Taiwan.

Just earlier, I was talking with several of our panelists that when a new secretary comes into the department, he brings in new consultants who will say that what they are doing is wrong. And so their department plans are changed. In contrast, Japan has ten-year plans which do not change just because the leadership changes.

We have tried clustering with some successes in different parts of the Philippines that is why by next year, we shall be able to come out with a convention on success stories on clustering. The many discussions we had are those that have come to my attention because I go over the Philippines. On the national cluster approach, we have now a memorandum agreement between and among DA, DTI, DOST, and private sector all working together including the academic sectors in all the regions and provinces of the country and the various sectors including the knowledge sectors. We are pushing this year the tourism cluster including eco-tourism, health sector, engineering, etc. All these should be done and we hope that you do also some clustering by yourselves. But when you cluster, remember the four Es that I like to impart as a final message. First: after clustering, we must reEngineer the whole system and it can take many steps. Second: we need to Educate our people. Third: we must study Entrepreneurship. Fourth and the final one, let's try for Excellence because if we are content to be number 57 for jewelry and in the furniture business, if we do not work for excellence, then we will always be way behind. So with this, I would like to thank you for the interest in this subject. We hope that we have challenged you all.

## **Social Dimensions of Philippine Agriculture 2020**

### **AMENDING THE COMPREHENSIVE LAND REFORM LAW**

**Academician Raul V. Fabella**  
Dean, School of Economics  
University of the Philippines Diliman  
Diliman, Quezon City, Philippines

Thank you very much. I am honored to speak before you today as a panelist on the social issues surrounding agriculture.

You already have been provided with ample data on the backwardness of the Philippine agriculture. While to a certain extent, this state of backwardness of Philippine agriculture can be attributed to natural calamities such as typhoons and floods, the greater part of the blame must be charged to institutional failures. The Philippine government has not only failed to provide proper irrigation facilities and farm-to-market roads, it has also failed to provide progress-enabling policies in the agricultural sector. Some of them are associated with great social engineering experiment called land reform.

The rest of my comments will focus only on land reform. This is touched on in Section 2.8 of the Philippine Agriculture 2020 authored by Academician Javier and Dr. Alberto Aquino. So, I will dwell on a few particular issues associated with the land reform law which may help put in perspective Agriculture 2020.

A comprehensive agrarian reform law has of course the social desideratum, equitable asset distribution, on its sails. This is, no doubt, very appealing. The equitable distribution of land assets it is argued will improve both the politics and the economics of the farm sector. This has two parts: better democratic politics as rural politics begin to be divorced from the grip of large landownership and greater farm-level efficiency as small landholders, energized by "ownership" work harder to make the land flower. The economic efficiency argument had for a long time the weight of econometric evidence on its side. Before 1987, studies appeared to show

that per hectare production of rice increased with a fall in farm size. In 1988, a study by Bhalla and Roy (1988) showed that when land quality was controlled for in the earlier studies, the farm size-productivity nexus reversed sign and robustly so. The economic efficiency argument for land redistribution disappeared. There may indeed be scale economic forces at work in farming. The political argument however remains and, given our legacy of insurgency based on land disputes, it may still be worthwhile to sacrifice economic efficiency for better democracy. But because of the way this project has been implemented in the Philippines, it has become a veritable millstone on Philippine agriculture.

The enabling law for land redistribution, the Comprehensive Agrarian Reform Law (CARL) was passed in 1987 and will be 20 years old in two years time. The fact that this has taken so long (20 years for CARL and almost half a century since the first land reform law, RA 27) means that our agricultural economy has suffered decades of ill-defined property rights and highly uncertain investment climate. This has led to virtual drought in private fixed capital investment in agriculture. This cost is incurred long before the area becomes a land reform area. But the cost escalates when the area becomes a land reform area.

I will focus on Section 27 of CARL.

(1) Section 27 outlaws any market transactions (the sale, rent, usufruct or other tenancy contracts) on land in all land-reform areas (that is after the area is declared a land reform area and before the tenant beneficiary has paid in full). After the tenant has paid in full he/she may sell but in a distorted legal market where the potential buyers are the landless who can't afford and can't borrow to afford. The delegitimizing of land transactions has virtually destroyed the legal rural credit market especially that associated with crop loans. The rural economy is of course a matrix of linked contracts and the rural credit market is intimately linked with the rural land market. If the land market is outlawed, legal credit also dries up since land asset no longer qualifies as loan collateral because the creditor can neither hold it (>5hectares is illegal) nor sell it. Well, if the beneficiary of land reform cannot access production credit, he and his land becomes unproductive.

As a result, the formal credit market has been supplanted by the underground credit market where enforcement of contracts is private (some illegal arrangement in the use of land as payment such as "posiyentuhan" which in the murky waters of DAR jurisprudence is not considered a tenancy

arrangement or mafia-style physical harm). A farm sector without a functioning credit market is a dead sector so the underground credit market is a savior. It has two very pronounced toll: First, it is a very high borrowing cost market. For example, 60% is the interest rate charged per crop season in Maragol and Gabaldon, in Nueva Ecija in one survey in 1998 vs. 9.5% every 6 months from the local bank. That makes for poverty-stricken farmers. Second, it also erodes the rule of law in the area. When law-breaking is the only way to survive, law-breaking becomes a way of life which spills over to other laws. Section 27 of CARL, in effect, imposed a permanent *credit crunch* in the rural sector.

In economics there is a beautiful result called the "Coase Theorem", after Ronald Coase, Nobel Memorial Prize winner in Economic Science. The Coase Theorem is actually very intuitive, very simple. It says that asset redistribution to favor equity should not prejudice economic efficiency as long as assets can be readily traded in the market.

CARL violates the second part of the Coase Theorem and therefore militates against economic efficiency. For example, take the case of two people, Pedro and Juan. Pedro has the title to a piece of land L; Juan does not. Pedro produces 100 cavans of rice per hectare; Juan can produce 20 cavans per hectare (is less productive for whatever reason some of which will be treated below). Suppose, we redistribute land L from Pedro to Juan but do not allow any market transactions on land and do not allow other tenancy arrangement. Now Juan produces 20 cavans of rice per hectare instead of the hundred previously produced. Society loses 80 cavans per hectare! This is very economically inefficient!

If however, land can be traded in the market and other useful contracts are allowed, then Juan can for example lease the land to Pedro who proceeds to produce a hundred cavans of rice. He gives Juan 30 cavans per hectare as rent and keeps 70 for himself. Juan is better off and society is better off with 80 cavans per hectare more and economic efficiency is served. That is the Coase Theorem. And the Comprehensive Agrarian Reform Law (CARL) Section 27 has outlawed the Coase Theorem.

Land conversion from farm to urban in locations where that can be very lucrative has become a cash cow for the politically powerful people who can influence local DAR decisions and enforce contracts if need be outside the law (the Remulla syndrome). For this to happen, the farmer has to stop planting and leave the land idle. Furthermore, extant irrigation may have to be destroyed to avoid the legal restriction on irrigated land conversion.



Thus land transactions and consolidations are still happening but outside the law.

The second problem with CARL is the "entrepreneurship fallacy". CARL mandates that all bona-fide tenants be awarded a parcel of land. Now, as lowly as society views farming in this country, running a farm is truth be told a complex entrepreneurial undertaking as many NGOs have found out which went into farming. The farmer-owner has to arrange financing, do the land preparation, procure the seeds and fertilizer, do the weeding, decide on the timing of planting, seeding and harvest, contract a buyer and negotiate the price and hope to God the weather cooperates. Since this climatic cooperation is a random event, the farmer has to arrange an insurance of some form or other. Only a small part of these had she/he the exposure to deal with. To think that the only barrier to farmer entrepreneurship is ownership of land is the height of fallacy! If the beneficiary doesn't have entrepreneurship ability, he may founder and may be better off as an employee. But with Section 27, he/she cannot legally opt out anymore. He is forced to be an entrepreneur! This can be remedied with the Coase Theorem which Section 27 bars.

There are many other reasons why the farmer-beneficiary may want to opt out. He/she may be physically incapacitated; he/she may feel that the best use of the land asset is to sell or mortgage it for a sum that will finance an OFW job for a child or the graduation thereof. In many rural areas, people no longer associate upward mobility with farming but with OFW remittance and for good evidence-based reason.

The third most glaring problem with CARL is a uniform land-ownership ceiling of five hectares across all crops. The assumption is that a farmer can become economically progressive at five hectares whether in rice, sugar, coconut, banana or whatnot. This is hardly warranted. There is a study (Fernandez and Nuthall, August 2001) that shows that sugar farms averaging 4 hectares on average lose P227 per hectare. They also produce the smallest tonnes canes per hectare (41 vs 52 for farms averaging 26 hectares). But even this arbitrary area ceiling problem can be remedied if Section 27 is abolished.

A fourth glaring problem is that most awarded lands are in a state of limbo called Collective CLOA (Certificate of Land Ownership Award). Under collective CLOA (which comprises about 2 million hectares and about 1 million farmers), beneficiaries cultivate parcels of land they are not sure of eventually owning. Thus the extra care and diligence expected of

an owner in the use of his land especially as regards permanent improvements such as tree planting may be discouraged.

There are several bills pending in Congress intending to address the contentious issue of how to provide credit to farmer-beneficiaries. The corollary issue is the collateralization of land assets so credit can start to flow. One approach is just simply freeing the rural land market. This involves lifting all restrictions on land transactions after land has been awarded. The beneficiary can simply opt to part with his land for an agreed fee that pays the liabilities of the land with the Land Bank plus a premium which represents a redistribution of wealth. This effectively takes out Section 27 of Comprehensive Agrarian Land Reform Law. This changes somewhat the philosophy underlying land reform: it becomes a transfer of property rights to redress the historical injustice, the "the original sin" of land being forcibly grabbed from original (indigenous) owners, and sanctioned by the state. What happens after that is a market outcome. This is the *Second Fundamental Theorem of Welfare*.

The second approach is to make the state a guarantor of all loans contracted by all the agrarian reform beneficiaries. This is a prescription for an orgy of moral hazard: the farmer borrows and use it for production or something else; the bank does not care either to collect or to check how it is used because the government will pay! There is no accountability anywhere! This is a prescription for a fiscal quagmire and endless rent seeking!

My own feeling is that the reform should be two parts: First, CARL should, if continued, be amended in one fundamental area: abolish all restrictions on land transactions after awarding. Second, the country should enact a law mandating a land tax graduated on the basis of land size.

Thank you.

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## **Social Dimensions of Philippine Agriculture 2020**

### **“PEOPLE” CHARACTERISTICS OF PHILIPPINE AGRICULTURE**

**National Scientist Gelia T. Castillo**  
National Academy of Science and Technology Philippines

Philippine Agriculture 2020 is not starting tabula rasa. Although looking forward to a 2020 which envisions “robust and vibrant agricultural and natural resources production systems and ecosystem services that improve and sustain the Filipino’s well-being,” Philippine agriculture has a past and a present which either stands in its way or leads it toward a future as a new way of life. A science-based strategy requires that we look at what was and what is so we can chart the future with “eyes on the road”.

Some “people” characteristics of Philippine Agriculture could be relevant in this regard.

#### **1. Poverty**

A. Balisacan describes Philippine poverty as “still largely a rural phenomenon. While the share of agriculture in the total labor force has gone down from about one half in the late 1980s to only a little more than just one-third by the mid-2000s the sector continues to account for 60 percent of total poverty.”

The incidence of poverty is also much higher in some regions than in others. Moreover, farmers do not always regard farming as a way out of poverty. They send their children to school so they do not have to become farmers.

#### **2. Land tenure**

From the mid-eighteenth century when a class of landless peasants emerged until most of the 20<sup>th</sup> century to the present, social justice by equalizing access to land has been a recurrent social theme. P.U. Gordoncillo’s study of the comprehensive Agrarian Reform Program showed that despite the fact that share tenancy has been declared illegal, about

16.5% of rice farmers were still share tenants. C. Reyes on the impact of agrarian reform on poverty reduction found the following positive factors: length of time being agrarian reform beneficiaries, smaller household size, higher educational attainment, living in an agrarian reform community, tilling irrigated lands, and having access to credit or no need for credit. However despite this positive impact of agrarian reform on farmer-beneficiaries, poverty incidence remains high (more than 50 percent).

In estimating available hectareage of land for agriculture, it would be prudent to look at claimants, not just occupants. For historical, political, and inequity reasons, there is probably not much land still unclaimed by government, ancestral domain, private individuals, corporations etc. This makes land use decisions more complex. Furthermore, even in land-reformed areas, new subtenancy arrangements have emerged. Some agrarian reform beneficiaries who acquired land treated it as a tradeable asset to be used not necessarily for farming but as investment for work abroad or for children's education so they could move out of poverty. "Land to the tiller", an old battlecry does not seem to be the dominant value anymore. Land reform is asset reform, no matter what the asset may be used for.

### 3. Farm Labor Arrangements

At present, there are two types of farm labor: those hired on a long-term contract are called UPAHAN; and those hired on a daily basis are called "MAGPAPAUPA". There is no landlord-tenant relationship even for the UPAHAN. Hired labor rather than family labor is the predominant way of getting things done in the farm. This is the practice even in small farms. In general, BAYANIHAN as exchange labor in farming has "gone out of style" except in remote upland areas.

For a country which has a high rate of population growth, labor shortage is a frequent complaint of farmers. Agricultural technologies which are labor-intensive are less likely to be adopted. For PA2020, what will be required is not the traditional bayanihan but the new imperative of collective action for joint individual interests and for the common good. The use of water and other natural resources would increasingly become contentious common property resource issues requiring new norms and relationships between different users, within and beyond agriculture

### 4. Social Structure of the Farming Community

Population pressure, agrarian reform, new agricultural technologies,

increasing educational attainment, and new non-farm income resources have changed the social structure of the traditional farming community. In the past, farming was the major, if not the only source of income and landlord-tenant relationship determined the power structure. Nowadays four social classes have emerged as observed in rice growing areas:

- (a) the large farmer (2 ha. or more)
- (b) the small farmer (less than 2 ha.)
- (c) the landless agricultural laborers who have no farms but earn wages as casual farm workers; and
- (d) the new social class called non-farm workers

In general, access to farm land for new farmers has practically closed; given all the factors cited above, plus land conversions for non-agricultural uses. Only children of farmers tend to have such access although most of them, if educated would not opt to enter farming. The farming population is also an aging population.

##### 5. Rural Livelihoods

One question we have often been asked is: "Who is the Filipino rice farmer? Or the coconut farmer? Or the corn farmer? Of the sugarcane farmer? This is not a simple question which produces an instant answer. The reply involves an analysis of who has access to the land with respect to tenure status; who actually works the land; who operates and makes decisions in the farm; what the farm consists of; and the institutional arrangements with respect to the use of land, labor and capital etc. Along with the changing definition of "farmer", is the changing concept and reality of rural households' livelihood systems. It is no exaggeration to say that nowadays, the purely rice farmer is a rarity, if not a non-existent entity. Instead, we have someone who grows rice as one way to make a living or to secure the household's rice supply. This is done along with producing other crops, livestock, trees, engaging in off-farm work, non-farm jobs, and are recipients of remittances from the city or from abroad.

In coconut lands, quite often those referred to as poor coconut farmers are actually caretakers of the coconut farms which are owned by somebody else. In some instances they are allowed to plant crops or raise livestock under the coconut trees, with or without a sharing agreement with the landowner. Under such arrangement, the caretaker has temporary access to the land, but he is not a tenant.

Sugarcane workers in sugarland are not farmers. They are landless agricultural workers. Ironically, sugarland owners call themselves SUGAR PLANTERS but they are not the ones who plant sugarcane.

The definition of “farmer” is quite crucial in determining the stakeholders in agriculture; their roles as decision makers, tillers, manager and who are likely to benefit from PA2020. Most of these stakeholders are net purchasers of food and other agricultural products.

Village-level studies have shown that the structure of rural household income has shifted from mainly agriculture to multiple livelihood sources, including earnings from more urbanized occupations and remittances from household members working in urban areas or abroad. Almost half of rural households studied receive remittance as a source of income although agriculture continues to be a source of income for almost all rural households.

In other words, most farming households are now engaged in part time farming and the rural and urban are no longer the separate worlds we have always defined them to be.

#### 6. Subsistence and Commercial Farming

Agriculture experts are very prone to divide farmers into subsistence or commercial. Actually it is not a dichotomy but a simultaneous existence with either of them more prevalent than the other in the same farm. In most instances one enterprise supports the other. For example, sweet potato in Tarlac is a cash crop, earnings from which helps purchase inputs for rice production for subsistence.

As long as income security is not available to the farm household, top priority in their lives is household food security. The usual strategy is, to sell cash crops or livestock to buy rice. But if they grow rice, the first priority is to set aside some amount for household consumption. Even in predominantly rice producing provinces, households allocate more than 22 percent of rice harvest for home consumption. Households in rice-deficit provinces keep above 42 percent of their harvest for food. When supply runs out, they end up being net purchasers of rice. But it is always a source of pride for farm households to say that they do not have to buy rice.

#### 7. The Emerging Protagonists in the Land Issue

Population growth and urbanization has led to changes in patterns of land use. What is most interesting is the new protagonists in the land issue. While in the past, it was landlord vs. tenant, now it is farmers vs. real estate

developers. The land market has tempted even agrarian reform beneficiaries to part with their land for much better earnings than the rice, corn, or sugarcane harvest.

The real estate developer has a powerful argument for land conversion. They say that a three-hectare rice farm can house hundreds of urban dwellers but it could provide livelihood for only a few farmers.

#### 8. A New Breed of Farmers

"PA2020 rests on three pillars, namely: organizing and managing agriculture as a business; alleviating poverty through asset reform; and nurturing the values of nature and community in our people."

Because of the knowledge management, organization-intensive, and value-laden nature of these pillars, we need a new breed of farmers. The slogan "to see is to believe" will no longer suffice. Some, if not most of what will be involved in this agricultural transformation will not always be immediately experienced and may not always be directly visible to the naked eye. Seeing and thinking not only in the abstract but also in the future and for the common good must be learned. The pedagogy of this learning process particularly the social learning part has scarcely begun to unravel.

As a society, we need a new ethic of sharing and collective action for the common good as Filipinos. Despite our romanticized bayanihan, these values do not come to us easily. They have to be translated into tangibles for development, so people can experience the difference in their lives.





## **Social Dimensions of Philippine Agriculture 2020**

### **THE ENABLING STRATEGIES**

**Jose M. Yorobe Jr.**

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The Philippine Agriculture 2020 long-term plan of the National Academy of Science & Technology comes in a period of mediocre performance of the agricultural sector. Agricultural productivity has been low particularly in the 1990s and poverty in the sector is becoming more pervasive. The anticipated changes in productivity and efficiency are far from realized.

The PA 2020 therefore, envisions to provide the necessary reforms to make the sector an engine of growth by the year 2020. The approach is to first integrate agriculture, environment and natural resources sector and the social systems follows using three enabling strategies of technology development, investment and governance reforms. This plan is welcome and timely. It is timely in part as it addresses the urgent need for agricultural reforms in a changing global environment. It is also a welcome endeavor primarily because it improves the well-being of the real stakeholders in agriculture—the farmers, the business managers, extension workers, civil society, academicians and scientists.

Considering the complexity of the plan, I will not address all the issues on social concerns particularly those I am in broad agreement with the writing panel such as those addressing governance, technology development and the transformation of production areas in less favorable environment. Instead, I will focus my discussion on the enabling strategies of the PA 2020.

I will deal with the specific strategies related to the goals of the plan to improve human well being and that is reduction in poverty, enhancing food security and improving the sectors' competitiveness. There are probably several measures of poverty and I believe that the plan follows the purchasing

power of parity indicator used by the World Bank and the U.N. Millennium Development goals, that is, the number of people whose per capita daily consumption is less than one dollar per day. This measure however, reflects only the level of income but there are other equally important dimensions of poverty such as health, education, justice, and the environment.

To combine all these poverty dimensions into one measure will be difficult but more relevant in terms of gauging the general well-being of a person. Poverty as envisioned in the PA 2020 strategies is more of "income deprivation" although one can argue that this can have the greatest weight among the dimensions. By promoting "productivity enhancement programs" in the agriculture and forestry sectors, poverty is addressed in the long-term plan as productivity translates to higher farm income. However, studies have shown a weak correlation between poverty and income. Even in large increases in real income, farmers may still not feel better off simply because of their present circumstance other than income which is outside the realm of agriculture.

Second, food security is addressed in the PA 2020 through food self-sufficiency programs that can be achieved by raising the level of productivity and efficiency in the food sector. The objective is to increase agricultural production by 10% and the gross value-added of agriculture by 30% of Gross Domestic Product (GDP). I consider this as modest targets for the strategies proposed in the plan. For example, planting all of our corn areas with Bt corn can already satisfy the 10% increase in production as it can increase yield by as much as 37%.

But raising the level of output does not readily translate to higher income. Given the existing traditional markets, the expansion in production may drive prices to very low levels in the local markets unless safeguards are put in place e.g. better post-harvest facilities and market information. There are now testimonies to support this, e.g., the tomatoes in Northern Luzon, calamansi in Mindoro, and vegetables in Central Mindanao. To address the increase in output, the broadening of alternative markets need to be developed. These may include export, retail and other consumer markets. As a strategy therefore, market development will be a key instrument for farmers to realize the income generated by the additional supply.

Third, the role of the LGUs will be instrumental in the implementation of the technology development strategy for they now perform the agricultural extension function as a consequence of the devolution law. Technologies and programs are developed by the DA in tandem with state universities

and colleges (SUCs) but, the actual delivery to small farmers is mainly the function of the LGUs agricultural technicians. In the extension continuum, they represent the final link to the farmers. The strong linkage between DA and the LGU will then be a major determining factor in the continuum.

I just came from a field survey for a research in agricultural marketing and requested for the assistance of the agricultural extension officers in the field. In most cases, the assistance was either delayed or limited. Farmers also complained on the quality, quantity and timeliness of technical assistance delivered to them. Since their functions have been devolved to the local government units, their full assistance may sometimes falter particularly in LGUs with little appreciation of agriculture. In addition, their extension activities are very much constrained by the limited resource allocated to the unit. The investment capabilities of the LGUs can also be harnessed to develop and improve local agricultural infrastructure, human capital, and institutions. This is now piloted, I think, in Mindanao by the World Bank. Agricultural policies will also play a key role in the development of the agricultural sector by strengthening the environment where production, marketing and investment take place. Many of these policies and program are now in action but, policy reforms will be necessary to make them consistent with the goals of PA 2020.

There is now an urgent need to review these policies and programs due to conflicting objectives by some of these policies while others are no longer relevant to the present conditions. And equally important, it goes without saying, that these policy-reforms should be implemented as planned.

The last is on the issue of competitiveness. I dwell on the role of the cooperatives and how they operate as a business as participated in by small farmers. Due to smallness and limited resources, farmers cannot ordinarily compete in the market place. The needed investments to make them more efficient are not within their reach. To operate and compete as a business, they have to act collectively and pool their resources to improve their bargaining power. Considering their operational structure, this will be difficult to achieve without the necessary management skills.

Agricultural cooperatives with production, credit and marketing functions are now in operation but, many have become insolvent due to mismanagement. Two years ago, we had a chance to evaluate 10 out of the 40 cooperatives that were given public funds for post harvest facilities to include transport, buying and selling, milling, and facilities for grading and standardization. Out of the 10 that we have evaluated, only 1 was

**profitable and the others were either inefficient or simply mismanaged. Many of these cooperatives simply do not know how to operate the business side of the postharvest scheme.**

**As a strategy on competitiveness, the PA 2020 should have a second look at these cooperatives and explore the role they can play in the development of the agricultural sector. Thank you.**

## **SOCIAL DIMENSIONS OF PHILIPPINE AGRICULTURE 2020**

### **OPEN FORUM**

**Dr. LS Sebastian, Philippine Rice Research Institute:** First of all, I have a disclaimer, I am not a social scientist so please pardon me for my language if I do not use your lingo very well. I am one of those research managers who advocate a strong social analysis of whatever we do especially in our R&D activities. I think with the Philippine Agriculture 2020, there is a need for us to really make a very good analysis of our social situation and incorporate this in our plans. I say this based on my experience and especially when we are dealing with farmers just like what Dr. Castillo has mentioned while ago. Most of them are very poor in their social preparation and the social analysis of this group is very important if you are to succeed in recommending any good plan or any technology in the future.

Dr. Castillo mentioned for example the “abroad syndrome” of farmers. I think that this is also true among us planners and researchers. Sometimes we also have that abroad syndrome, not because we want to go abroad but sometimes we tend to compare ourselves with other countries and then prepare plans that are either better or even grander than what Thailand or Indonesia, our neighbors have, but we forget our people, the Filipino. So there is a big gap between lands that we are preparing and the people you would like to have. So, I think Dr. Castillo and her group, I hope, will do a more thorough analysis in setting the framework for the Philippine Agriculture 2020 because I believe that if we will fail in the analysis of the social and political aspects of our country, our plan will be as grand as it has been and it will never be implemented by future generations and it will probably fail also just like other plans that we have today.

**M. Lim, Former Undersecretary:** I have a question which is more directly concerned to Dr. Yorobe. We know that in general, cooperatives and similar farmer groups lack preparation in enterprise and this has therefore resulted in a very high level of failures. My question is does PA 2020 adequately address this problem of social preparation of farmers for enterprise particularly farmer groups?

**Dr. J Yorobe:** PA 2020 mentions the importance of farmers organization but it has not mentioned anything about social preparation for this organization to succeed. Actually, the concept of this collective work has already been introduced before. If you can remember the “selda system” introduced by the Department of Agriculture during that time. I do not know if it was Secretary Tangco or Secretary Sebastian who introduced it but the number is only very small compared to a cooperative system.

## **Health and Nutrition Issues in Philippines Agriculture 2020**

### **FOOD AND NUTRITION SECURITY**

**Rodolfo F. Florentino**

President, Nutrition Foundation of the Philippines

Let me focus my remarks on food and nutrition security, which certainly must be one of the goals of Philippine Agriculture 2020, just as it is in the national development goals.

First of all, I wish to emphasize that food security pertains not only to availability, accessibility and affordability of food but to the nutritional quantity and quality that satisfy the dietary needs and food preferences of people for an active and healthy life.

This implies a number of attributes of our food supply in order to achieve food and nutrition security. First of all, it is obvious, that food must be available, accessible and affordable to all. And then, however, it must be adequate in calories to satisfy energy needs. Food also has to be appropriate in quality, that is, it must be nutritionally adequate in the pattern to satisfy the requirements of the various essential nutrients, particularly, protein that would enable the population to pursue a healthy and productive life, devoid of nutritional deficiencies. Then of course, it must satisfy food preferences and cultural practices of the various geographic and cultural groupings of our population. Finally, food must be safe, referring of course, to the absence of toxins and hazardous elements in food.

So, what then is the situation today? The latest information on our nutrition situation says that there has been a significant improvement in the prevalence of underweight school children, a reduction from 34% in 1990 to 27.6% in 2003, as shown in the latest national nutrition survey of the Food and Nutrition Research Institute of the Department of Science & Technology. Prevalence of underweight school children is an indicator of the nutritional status of the population.

We see also an improvement in the per capita food consumption from 1993 to 2003. Our total food consumption in 1993 was only 803 grams per



capita per day. But it increased to 879 grams per capita per day in 2003. This shows that there is some improvement in our nutritional status. In terms of caloric intake, there was an increase from about 84% in 1993 to almost 100%, or 98% energy requirement in 2003. These show that there has been in fact some improvement in the nutrition of the population.

However, if we look at the trend of the nutritional status up to 2015, we will still be unable to reach the medium term goal of 17.2%. There is such a big gap between the trends in our nutritional status to our medium term goal as expressed in the medium term plan. In fact this 17.2% is only a very conservative estimate. In Taiwan, for example their figure for malnutrition in the underweight children is already in the order of 15% whereas we are still in the area of 27%.

If we now look at the food pattern, we notice the large proportion of cereals, mainly rice, in relation to the other food groups and this is reflected also in the proportion of total carbohydrate in our food intake in proportion to total caloric intake. The amount of carbohydrate is in the order of 70%, while the fat intake is at a low level of 18%. But then, this local pattern is actually the pattern of our present food supply. Thus, if we compare our food supply to a desirable dietary pattern, we could see deficiencies in animal feeds, in fats and oils, and in beans in terms of nutritional requirements.

Another indication that the quality of our food intake is not good enough is the inadequate intake of micronutrients, for example, iron, calcium, thiamine A, thiamin riboflavin and ascorbic acid. They are all very low compared to our recommended nutrient intake. And that is the reason why we still see a large number of micronutrient deficiencies, namely, anemia and vitamin A deficiency which are still prevalent among our children.

Even among adults, we see the prevalence of chronic energy deficiency to the extent of 10% up to the age 49 and it goes up in the elder years to as much as 23%. I have not shown here the other side of the picture, the increasing prevalence of overweight and obesity particularly among women in the middle age group. The prevalence of overweight in the elderly is about 25%. Thus, we now are facing the double burden of under nutrition among the poor segments of our population and over nutrition on the other side.

So, faced with this scenario, may I suggest the following:

- 1) There is a need for a paradigm shift from simply trying to satisfy current and future food demand based mainly on current food pattern

and on population projection to one which is gradually trying to improve this demand to a chain in food supply pattern towards one of higher nutritional quality in anticipation of the socioeconomic improvement of the population. As a first step, I suggest that the agriculture commodity goal consider nutritional objective both in terms of quantity or caloric requirements as well as in terms of quality, meaning food supply pattern in terms of food group based on nutritional contribution. We could project supply needs in the coming years with nutritional requirements, particularly, in terms of calories and proteins and consider these patterns in planning our food supply goals. However, of course, we should take into account the inevitable losses and inequality distribution in terms of both geographic and demographic distribution. In our earlier estimates, the margin to allow losses and inequality distribution amounts to about 25 to 30% above our nutritional needs.

- 2) I think we should consider regional food requirements as well as urban rural differences in dietary preferences in planning for the food supply pattern. As the population shifts from predominantly rural to predominantly urban, food requirements will change both in terms of both in quality and quantity. In other words, agricultural goals will need to satisfy these shifts. Most specifically, I suggest that the goals consider improving supply of animal foods, added fats, pulses and beans, fruits and vegetables in order not only to diminish our dependence on cereals and carbohydrate food but more importantly, improve the nutritional quality of our diet towards higher quality protein, more vitamins and minerals and dietary fat.
- 3) Pursue biofortification as expressed already in Agriculture 2020 by using both plant breeding and modern biotechnology to improve the intake of micronutrient such as iron, beta-carotene and zinc.
- 4) And finally, as we make our plans for improving our food supply there is an emergent need to improve the economic lot of our farmers and fishermen especially the fishermen whose condition is worse than the agricultural farmer, through extensive extension work together with focused social and economic programs. Thank you very much.



## **Health and Nutrition Issues in Philippine Agriculture 2020**

### **MODERN BIOTECHNOLOGY AND OTHER INNOVATIONS**

**Nina Gloriani Barzaga**

Professor, Department of Medical Microbiology  
College of Public Health  
University of the Philippines Manila

In its assessment of Philippine agriculture, then, now and in the next 15 years, PA 2020 addresses the very core of what I see as a major driving force that will propel Philippine Agricultural growth to greater heights especially in having a positive impact on our nutrition and health.

Currently, we have a number of medicinal crops in the market such as *lagundi*, *banaba*, *ampalaya*, *noni* and *sambong*. These are produced through conventional plant breeding practices. They have not been refined but they have been put in table form so that they are more easily administered in relatively measured doses. This has become a multi million peso agri-medicinal product that has transformed our market in the pharmaceutical industry.

As a scientist affiliated with the health profession, I have also been for the last five years or so an avid advocate of biotechnology and have seen how we have commercialized in our country crops or food products of modern biotechnology which do not only increase yield but also reduce pesticide or herbicide dependence.

The integrated pesticide management that is practiced with the use of Bt corn and herbicide tolerant soybean has already reduced farmers' exposure to pesticide and more toxic herbicides. The planting of such pest resistant crops such as transgenic corn has also produced good quality corn kernels without the microbial toxin contaminants seen in traditional corn borer susceptible varieties. This would translate to reduced aflatoxin exposure which we know has carcinogenic potential.

I have also realized the tremendous potential that merging of agriculture, food biotechnology and medicine can bring. The agricultural sector has set

the pace for biotech industry in research development of genetically modified crops, controlled animal breeding and the production of transgenic animals. On the one hand, biotechnology will soon provide more and better agricultural products for producers and growers for food and feed. On the other hand, I see that it will expand crop or animal production options as more and more pharmaceuticals and industrial chemicals are produced in green plants as well as in animals.

We are going to see a real convergence of food biotechnology and human health therapy. PA 2020 with its vision and plans for technology development can make this happen in our country.

Other products of biotechnology that we use in testing microbial agents that may infect our livestock are those diagnostic tests that detect foot and mouth disease virus, avian flu, and prions that cause bovine spongiform encephalopathy or mad cow disease.

The modernization and upgrading of our laboratory capability as set forth in PA 2020 will certainly help us strengthen our quarantine procedures and surveillance for emerging diseases that have devastating consequences to human health. Thus, three points in PA 2020 that I think are most relevant to medical and food biotechnology and public health in general are the following:

On the first pillar of PA 2020— that of organizing and managing agriculture as a business. We can start seriously looking at ways by which we can apply our laboratory findings, our discoveries to commercial products of higher value. My talking point here is that of creating transgenic crop like tomatoes or bananas that have pharmaceutical properties. Such crop would have definitely added value and would expand productions options for farmers and generate livelihood. The idea is to think of producing and selling for example tomatoes or bananas expressing vaccine molecules. And we at UP Manila are working on just that, inserting the salmonella type A gene in banana or tomato. Using this edible vaccine as an example for the transformation of banana or tomatoes alone takes on new uses generating new product and using value-added processing that will make them sell more.

The second enabling strategy of PA 2020 is setting the relevant technological development direction that looks at primary production technology support and biotechnology. Technology innovations must be looked into at various stages of product development, at primary production,

distribution system and processing such as value-adding like concentrating active components, freeze drying, or making such products available in easy to use form and with attractive product presentation.

And third and last is the need to further put in place appropriate regulation. This includes establishing food product standards, safety and quality assurance, not only for food derived by modern biotechnology but also for use of plants as biofactories for pharmaceutical products.

In summary, the multitude of scientific discoveries and technologies that have the potential to make "Philippine Agriculture a way of life must be fully harnessed to produce beneficial human health products. These technologies may further blur the lines between agriculture and the production pharmaceuticals and health products but I believe, this may be the way to go. PA 2020 offers this as an option. Thank you very much and good day.



## **HEALTH AND NUTRITION ISSUES IN PHILIPPINE AGRICULTURE 2020**

### **OPEN FORUM**

**Academician R Abarquez, Jr.:** The issue between agriculture and nutrition is a long way. A proposal to adjust the production, the source of food to the end user has a lot of pathways. One pathway which can determine nutrition is the social aspect of food patterns. So, I would like to get a reaction from our social scientist whether there is a likelihood of modifying food patterns. For example, there are regions that would prefer food that are rich in salt. There are regions that would prefer food that are rich in certain nutrients or lack of nutrients and, thus, from the production to the end users is a long way.

Another issue is in the advertisement of products. Usage of food, whether plentiful or inadequate, is driven by what advertisement can do to sell that product. So, this is an aspect that may account for the obesity problem in certain parts of our country.

And the last comment I have is on the issue of coconut oil. I hope that Academician Juliano can say something about this. Thank you.

**Dr. RF Florentino:** Well, I agree that we should look at the coconut as a source not only of nutrition but also cause of economic source. And therefore, in terms of nutrition, I think we could very well see the value of coconut oil. As a matter of fact, the reason why one of the many reasons why our caloric intake on the average of per capita basis is low is because of our low fat intake, mainly from plant oil and with low animal food consumption. But then, we have to look at the current supply. Because most, I think, of the fats and oils available goes out of the Philippines by export and in fact, the amount of fats and oils that is in our current food supply for domestic consumption is not enough to satisfy the caloric requirement and the proportion of fat in our diet is low. This should be in the order of 25–30%. Right now, we are only taking about 18% of our calories from fat.

**Acd. EQ Javier:** One of the more exciting clusters in the course of preparation of PA 2020 is the cluster on herbal medicine and health supplements. Our producers who are now engaged in exports are very



excited over the income and value adding potentials of herbal and health supplements. And, in fact, among the sectors, they were the most bullish in terms of their growth rate. But, I think there is a problem on the medical profession side. They are complaining that our national medical science system is reluctant to recognize the real health value of herbal medicine and other health supplements. And therefore, they have difficulty getting clearance or recognition for them to be able to expand their exports. So, we want to hear from our colleagues in the health field whether in fact this is an area that has scientific basis for promoting good health and how do we go about helping our producers, farmers and our exporters gain valuable foreign exchange for our country?

**Unidentified:** The primary problem is that drugs before they can be licensed for commercialization will undergo a long and very expensive process of isolation, purification, bioactivity testing and three phases of clinical trials. The most difficult is Phase 3 study on humans which require very specific criteria. On top of that, there is a postmarketing surveillance which is the responsibility of the company. As long as the drug is on the market, continued monitoring of its side effect is performed. And the moment that there are enough evidence to show that it is harmful it is withdrawn in the market.

Our herbals have not complied with these basic requirements, so they are sold not as prescription drug but as food supplement. When marketed as food supplement, then the control in terms of quality, toxicity, etc. may be lax. I agree with Dr. Domingo that there are really problems with herbal medicines and supplements but I think the way to go is to try and really provide scientific basis for their claims. Like for instance, ampalaya which has many therapeutic activities. At least on our part, we have been looking on the immunomodulatory activity of ampalaya and we have, to a certain extent, purified some parts of the ampalaya extracts which have this immunomodulatory effect. Now, if the antidiabetic principle of ampalaya could be identified, then it will be way toward having the scientific basis that we need for the medical community to accept such a product as a drug. But the therapeutic claims need to be supported by scientific evidences and this will be difficult.

At this point, I think most of what we have are in crude forms and this is because we want to sell them at probably the cheapest possible price. If we pursue further purification steps and identifying the single molecule that has the highest biologic activity then it will be tantamount to actually producing a drug. It will require a lot of resources which probably, we do not have.

**Mrs. Zenaida Salazar:** Adventist University of the Philippines, Silang, Cavite: I would like to ask what Dr. Barzaga can say. While it is true that in the Philippines, we are now reaping benefits from genetically modified food, and it seems that a lot of us agree with or buy the idea of eating genetically modified food. However, why is it that in other countries, they are negative about the use of genetically modified food?

**Dr. NG Barzaga:** Thank you for that comment and question. Actually, the issue on genetically modified food has been with us for the last six years. The problem is really not science-based but is more political and I believe social and economic.

The U.S. which produces I think more than 80% of the generically modified crops, of course, fully supports it. Europe does not but it has a lot of on-going researches that make use of transgenic plants and crops. The difference in the two is really on the problem of trade rather than scientific basis. For the last five years now, we have been doing advocacy work explaining the safe and responsible use of biotechnology and the risk associated with the use of such technology especially in relation to food. For example, two of the commercial crops genetically modified crops that we have here, Bt Corn and round up ready soybeans, have been assessed for safety already. And I would like to say at this point that over the last five years that we have been doing this education campaign, I have seen a better understanding of the public regarding such issues. It is important to fully explain what the benefits are versus the risk. There is no 100% safe food. I will have to say that. Even the food that we eat today may have some toxins. There is always risk in whatever we do. But the safety of food products of modern biotechnology is strictly assessed. If there are risks and if they are manageable, they are managed. If they are not manageable, they are not used or they are banned from being registered. So, it is a matter of education. We have had talks with farmers, professors, high school and elementary students, stakeholders, food chambers, food producers, and others.

**Academician RL Villareal:** Thank you very much. Mr. Chairman. Well, I think we should not forget that, indeed, vegetables contribute a lot of minerals and vitamins and the other aspects of functional food. But I think that if eating of vegetables will start from the family, maybe we can improve on the intake of vegetables. We have one of the lowest consumption of vegetables in the world today. And if we do not do anything about it, I think our population will suffer from malnutrition. To make the story short, Dr.

Florentino, of the Nutrition Foundation of the Philippines, what are the steps which your group has been doing to encourage the consumption of vegetables?

**Academician EO Domingo:** I would like to add a little question to what Academician Villareal has asked. Will the ideal or desirable food mix of Filipinos impact on the emphasis of PA 2020?

**Dr. R Florentino:** This exactly, what I was batting for. Instead of just looking at the current dietary pattern and say okay let us satisfy this with enough food supply and let us project this because of the increase in population, we should look at the nutritional quality of that pattern and try to improve in terms of supply and improved dietary supply pattern. I was hoping that in conjunction with the nutrition education effort of the nutritionist, for example, we would accompany this with an improvement in our food supply pattern. In the same token, we need to look at the desirable dietary pattern in our food supply. Then we can try to shift gradually the food supply pattern to something more desirable for the Filipinos.

In terms of vegetable and functional foods, this is one of the issues because we have deduced their functional values from draft scientific studies. There are also a lot of observational and epidemiological studies that have shown the value of functional foods. However, we need to determine the minimum requirements of these vegetables and other functional foods that will provide the phytochemicals and their health benefits.

## **Philippine Agriculture 2020 and the Environment**

### **ENVIRONMENTAL CHANGES AND CONSEQUENCES OF AGRICULTURAL PRACTICES**

**Academician William G. Padolina**  
Deputy Director General for Partnerships  
International Rice Research Institute  
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May I express my thanks to the panel of experts that put together the PA 2020 for their kind invitation for me to give some comments on the chapter on Agriculture and the environment. While it is true that the threat of hunger cannot be as critical as it was in the days of green revolution, the continuing existence of poverty and the increasing number of poor people continue to challenge our development agenda. We are losing farmland due to urbanization and our watersheds due to deforestation. And certainly, these trends will affect the poor because agriculture is basically a spatial operation. Productive land is needed and if land becomes unproductive, the poor will not only be dispossessed of their lands but also they will also need to take new ways for livelihood for which they are usually unprepared.

Let us just take some indications of the scenarios that are being developed now as we practice agriculture. In many countries, the farmers no longer get water they need for irrigation. Several river systems in Asia including the Yellow River in China which a year ago could no longer reach the sea during dry season falling short by 600 km and the Mekong River last year dropped to its lowest level ever recorded. When we look at rice production, for example, FAO statistics show that Indian farmers are pumping more than 21 million tube wells of 1.059 trillion cubic feet of water or 30 cubic km of water is extracted every year by farmers. This amount of water which is pumped out is more than what is replaced by rain. Also, there is now good evidence that global warming has a potentially serious impact on crop yield. The United Nations' inter-governmental panel on climate change says that without drastic action to halt emission of greenhouse gases, there will be a rise of 3.6 °C degrees in average global temperatures in the coming century, and this will certainly affect the yields of other crops.

I congratulate the panel for putting the Millennium Ecosystems Framework as the basis, as a framework for looking at the agriculture and the environment. The Millennium Ecosystems Framework recognizes the strong linkage between ecosystems and human well-being. People are part of the ecosystems; human activity and natural forces influence and transform ecosystems, and environmental sustainability is an issue that permeates all of PA 2020. But having said that, we all have to remember that food has to be cheap and affordable and easily accessible. And those producing food, the farmers have to be remunerated for what they're doing and they have to earn and their farming has to be profitable. But we also know that agriculture comes at a cost always to the environment. Very eminent scientists have looked at this question and they tell us that agriculture comes at a cost to the environment and that agriculture will be a major driver of environmental change in the next 50 years. Furthermore, the importance of looking at the environmental factors, monitoring them and understanding them is advocated and suggested very strongly by Clarke. These are the consequences that are identified as we look at environmental changes and consequences of agricultural practices—loss of ecosystems services, ecosystems simplifications, nitrification and habitat destruction and species extinction.

Studies on global warming and the impact on crop yield indicate a 7% reduction in yield for rice with the present atmospheric CO<sub>2</sub> for every 1 °C rise in current mean temperature and a regression analysis suggesting a 17% decrease in both maize and soybean yields for each 1 degree centigrade increase in growing season temperature for the period that was extended from 1982 to 1998 in the United States. So what we see here is human activity—economic, physical, social, political, exacerbates natural geological climatic changes that have impact on the environment and there is very strong evidence to show that climate change affects crop yield. But we also know that the performance and survival of plants and animals are affected, influenced by the interactions of their genes with the environment. The expression of genes maybe enhanced or inhibited by stimuli from environment and a biodiversity strategy needs to be adopted so we can manage the interaction between the gene and its environment.

Inputs and cultural management practices as we all know affect the integrity of the environment and natural resource management must now include a good understanding of the scientific basis of sustainability which unfortunately at this point in time is still very weak. When we talk about sustainable practices, we really find it difficult to translate it into specific

practices. But we now have new tools in science that will allow us to monitor and understand what is happening in the very complex situation such as the environment. These new tools include the: ability to perform high-capacity, high-speed computing, the ability to use modern biotechnology and understand genomics, ability to measure parameters in the environment using rapid high through-put chemometric methods, and in the social sciences—more and more techniques and methods have been generated for impact assessment. Integrated resource management is an important tool to control primarily water, soil, green house gases and the biodiversity parameters that are present in a farming system. But integrated natural resource management will not be effective unless you also manage the human population.

And as a last point, I would just like to put forward the idea of ecological forecasting which we will call global warning. We should use these tools in understanding the environment in order to put up an early warning system so that we can prevent further deterioration of the environment to its irreversible limits.

As a political statement, it is very important and it is a very pivotal portion of agriculture and environment agenda that a national land use plan be adopted immediately so that we can stop land guzzling which are not well thought out. It is the opinion of many experts that we may just have enough to feed the present population in the world with the present amount of land. If we expand further we will be endangering a lot of other aspects of our lives.

And finally just a food for thought, “there is no simple law of nature that makes technology the cause of economic growth or growth because of technological advance, it is always the interplay of people, economic institutions, growing markets and technology” and I say this because managing the environment and making farming profitable is going to be a very complex task and a very difficult task for all of us to undertake. Thank you.



## **Philippine Agriculture 2020 and the Environment**

### **STRATEGIC PLANS FOR RESOURCE DEVELOPMENT**

**Academician Angel C. Alcala**

Emeritus Professor of Biological Sciences and Director  
Angelo King Center for Research and Environmental Management  
Silliman University  
Dumaguete City

There are good reasons to consider seriously the environment in any strategic plan for resource development. First, the country's geographic setting is in a tectonically active part of the earth. Second, in the past 15-20 years, the frequency and severity of natural occurrences brought about or influenced by climate change and tectonic movements of the earth's crust have been increasing. Third, the effects of these natural events have been exacerbated by environmental degradation resulting from human-induced factors particularly since 50-60 years ago.

My brief presentation deals with some environmental constraints and environmental implications of proposed programs on poverty alleviation, food security, and resource sustainability, bringing together relevant material in the document, the lessons of the past, and the more recent research findings on both land and marine resources.

The four possible strategic adaptive responses, through interventions, to altered environments (Chapter 3) could well take into consideration lessons learned from past mistakes, in policy and programs, in disregarding the environment while pursuing development goals. The conversion of large areas of mangrove swamps to fishponds, prawn aquaculture sites and human settlements has compromised the capacity of mangrove ecosystems to provide ecological support and services for fishery production and for biodiversity preservation in coastal areas. Large areas of abandoned mangrove forests have not recovered to their previous status, probably because of the altered physical and chemical environment. These areas should be converted back to mangrove forests, which used to supply a greater part of the carbon requirement to sustain the productivity of coastal waters.



Prawn farming, which reached its height in 1988-1993, collapsed after 1993 due to disease and poor water quality, throwing thousands of aquaculture workers out of work. The collapse was due not only to environmental degradation but also to the greedy prawn farmers who ignored the principle of carrying capacity in pursuit of large profits in within a short time. This behavioral trait is the primary cause of massive fish kills of cultured fish in Sampaloc Lake in the early 1990s and in Bolinao, Pangasinan recently. The former event was triggered by the natural physical-chemical phenomenon of winter lake overturn. These incidents serve to remind us to incorporate long-term anti-pollution measures in large-scale aquaculture ventures.

The tendency of people to exploit marine resources to the point of local extinction without regard to sustainability is another negative behavioral trait. An example to illustrate this human trait leading to resource exhaustion is the heavy exploitation pressure on sea cucumbers presently occurring in the vicinity of the Gigante Islands in the Visayan Sea. The much lower biomass of fish and macro-invertebrates in the Spratly Group of Islands west of Palawan, a part of our exclusive economic zone, compared to that of marine protected areas in the Bohol and Sulu Seas is also readily explained in terms of this behavioral trait.

Fixing impaired ecosystem services is not easy to do. I doubt whether the projected timeframe of 15 years (2005–2020) is enough. In upland areas, one obvious long-overdue intervention is reforestation and forest protection in order to moderate flooding and the transport of large quantities of sediment produced from land erosion, negatively affecting fisheries. The massive reforestation 15 years ago was apparently not effective, as indicated by perennially swollen rivers such as the Rio Grande in Mindanao, which deposits sediment on islands 20 kilometers away. Up to 5% by area of reefs continue to deteriorate every year due to sedimentation and other man-induced factors.

In the marine environment, our studies with Dr. Ed Gomez indicate decadal timeframes of recovery of dynamite-blasted and typhoon-damaged coral reefs. Recovery in 10 years has failed to support reasonable fish biomass unless reefs are protected. Our recent studies with Dr. Garry Russ in central Philippines and that of Dr. Tim McClanahan in Kenya on fully protected marine reserves show decades of time for recovery of highly desired top carnivorous fish (e.g. groupers). The good thing about no-take marine reserves is that they result in spillover of adult fish biomass within a decade of full protection, which translates into improved local fishery production.

Although not a panacea, the establishment of marine protected areas or MPAs (coral reefs, mangroves, sea grass beds), as a proactive rather than reactive strategy, must be pursued during the next 15 years to boost fishery production in coastal ecosystems and conserve valuable marine biodiversity considered the highest in the world for near-shore fishes, according to Carpenter and Springer. One challenge is to increase the area of MPAs from the estimated 200,000 ha to at least 600,000 ha or 30% of 2 million ha of coral reefs in the Philippines. Another challenge is to set up deep-sea no-take marine reserves for recovery of deep-water dwelling and pelagic fish species (e.g. tuna, high value shells for the collectors' market).

MPAs prevent ecological phase-shifts from highly productive autotrophic natural ecosystems (e.g. coral reefs) to less productive heterotrophic ones (e.g. certain algal communities), which may include toxin-producing species. Already toxins (e.g. paralytic shellfish toxins) are produced by dinoflagellates in several bays in the Philippines during the northern summer months, rendering fish and shellfish unfit for human consumption.

The Asset Reform section of the document is a comprehensive discussion on the environmental support to production to alleviate poverty. There are a number of excellent recommendations, some novel (e.g. the concept of environmental lien of my friend, Atty. Tony Oposa) and others already in place (e.g. CBFM program of DENR; the popular CBCRM; establishment of MPAs)—all of which will increase production, preserve biodiversity and prevent or at least slow down the extinction rate of Philippine terrestrial endemic species estimated at 20-25% during the past 50-60 years. CBFM ran into trouble sometime ago, but the reason was inadequacy of the social component, which can easily be remedied. Community-Based Coastal and Marine Resource Management (CBCRM) has had dramatic results in the protection of marine biodiversity and improvement of local fisheries in the hands of empowered coastal communities and local government units under co-management and collaborative management schemes. As already mentioned, establishment of MPAs should be vigorously pursued to sustain demersal fisheries and to increase the area of presently protected coral reefs.

Increased agricultural activities (e.g. rice culture) also increases the production of ozone-depleting gases and increases chemical inputs to marine and fresh waters that could result in reduction of species richness, if not local extinctions, or in triggering red tide occurrences. Hopefully, these negative effects would be neutralized by CBFM forest areas and protected

tropical rainforests as well as by coral reefs, which also could sequester carbon dioxide. But increased domestic wastes generated by the increasing human population would require secondary physical/chemical treatments. And practically all coastal cities do not implement secondary treatment of their sewage and domestic wastes polluting the marine environment.

## **Philippine Agriculture 2020 and the Environment**

### **ASSET AND POLICY REFORM, ENTREPRENEURSHIP AND SUSTAINABLE DEVELOPMENT**

**Adolfo V. Revilla Jr.**

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#### **General Comments**

My small contribution to this “noble effort” focuses on the forestry/natural resources sector and **implementing the sector/cluster strategic plans on the ground**, but I cannot help but take a potshot at the theme, specifically on **poverty alleviation**. As a strategic objective, poverty alleviation will always fall short, thus it is **tantamount to perpetuating poverty**. While it may not be possible to eradicate widespread poverty in the country by 2020, with the appropriate development/poverty eradication plans and aggressive/sustained implementation, it can be done in certain areas/SDUs (sustainable development units). Note that the manner in which a poverty alleviation plan/program is configured, supported, implemented, monitored and evaluated is quite different from that of a poverty eradication plan/ program. For more than 50 years now, our economic development plans have always included a poverty alleviation component. That is all they have achieved and will ever achieve, **alleviate and perpetuate poverty**.

I find the major recommendations to be **quite comprehensive and relevant**, although not as comprehensive as when the agriculture sector is integrated into the total development system at the SDU (local) and national levels. And, there is such a need to integrate the agriculture sector into the whole development system.

#### **Asset Reform**

Under asset reform, I can agree with the recommendation on titling of CBFM areas (forestlands) to deserving beneficiaries provided suitable land

use is strictly followed. If private ownership is not acceptable then the usufruct rights/development projects of CBFM stakeholders in these areas must be made bankable, at the very least. This was recommended by FDC in the early 80s – for bankability of social forestry projects areas!

In rational land use allocation to attain specified economic and environmental objectives, the type of ownership is a minor consideration; the major concern is suitable land use. At the very least, incentives and disincentives should be resorted to, to rationalize land use allocation.

Another alternative is communal ownership of land and natural resources where user rights are given for specific purposes.

**Forest ownership.** – For check and balance, for efficiency and effectiveness, and for local autonomy, the country's forests should further be classified into: national forests (NIPAS areas, about 25% of production forests, watershed reservations for major structures), provincial forests (about 25% of production forests, provincial forest parks, provincial watershed reservations), municipal/city forests (about 50% of production forests, municipal/city watershed reservations, municipal/city protected areas), CADT/C forests, private forests, and others. The DENR cannot manage the country's forests; it is not organized, manned nor funded to be able to do so.

- CADTs within the timberlands are private communal forests!?

### **Forest Policy Reform**

**Proposed Forestry Policy of 2001** – simplifies, consolidates and presents the Philippine forestry policies in one document as opposed to the current disarray/maze of policies.

**Sustained/adequate forest production.** – I see no real justification for the importation of wood/forest products! It is the result of misdirected policies. Even under present conditions, we can maintain a forest products exportation norm on a sustained basis. It all depends upon our policies. Consider the following:

- Total natural forest – 5.4 million ha
- Second/third growth dipterocarp forests – 2.7 million ha; these are the remaining natural production forests; some 2.0 to 2.2 million ha of these (after taking out the protection/conservation zones) can be managed to provide continuous log supply of 4.5 to 5.0 million cum/year, about twice our current requirements.

- Whatever projected deficits there are 20 years from now can be satisfied adequately by increased productivity of the natural production forests and forest/tree plantations that need to be developed in CBFM and other production areas.

- This and the critical need to reforest/revegetate degraded watersheds require a national strategic reforestation plan/program that is supported by appropriate incentives and policies. The strategic plan must consider realities on the ground, e.g. species-site suitability (including non-trees), quality/availability of planting materials, available labor and other inputs, maintenance and protection, ...

### **Agriculture as a Business and Means to Attain Social Equity**

**Proposed strategy:** Capitalize on the success of the family-based corporation in pushing Philippine agriculture as a business to attain economies of scale and distribute more equitably the fruits of development to the less fortunate stakeholders.

- Community Forestry Development Corporation with Sister Watershed Conservation Foundation co-owned by interested family corporation(s), CADT/C holders, CBFMA Holders, LGUs, cooperatives, other investors, and other stakeholders
- Community Agri-Business Corporations with appropriate Sister Foundations, each co-owned by a family corporation, Land Reform Communities, Cooperatives, etc.
- Community Coastal Resources Development Corporation with Sister Coastal Resources Conservation Foundation co-owned by...
- Pasture Lease Agreement Holders. – Instead of simply family corporations, Community Cattle Industry Development Corporations should be formed. These leases involve as much as 2,000 hectares of land each and there are poor communities inside and adjacent to these areas.

### **Implementing Sustainable Development on the Ground (Relative to the sustainability dimension of the theme)**

The Agriculture 2020 strategic plans for the different “clusters” are national in scope. These are first approximations, at best, and serve as guide for integrated development planning at the “local” level, desirably at the “sustainable development unit” (SDU) level. If national plans are not translated into SDU plans and component operational plans, and are not

vigorously implemented, then they do not serve any useful purpose. (Example: The Forestry Master Plan, revised 12 years later before it can be translated into local plans!)

It is not enough to package and implement strategic plans for the various major sectors/industry clusters if the real-world issues are to be addressed adequately: population crisis, carrying capacity, environmental degradation, interactions among the various sectors/clusters/ecosystems/watersheds, and the other intersectoral problems in transportation, communication, peace and order and related issues. There is an equally urgent need to integrate all of these components at the SDU level, otherwise, we will always be off-course relative to sustainable development.

**The SDU concept.** – Basically, sustainable development means sustainable environment and natural resources management, development and conservation (including sustainable forestry), sustainable agriculture, sustainable services, sustainable industries, sustainable businesses, sustainable economics, sustainable support systems, and sustainable human communities, all integrated in space and time at the “**sustainable development unit**” (SDU) and broader levels. True sustainable development requires that each integral component of the total development system must be sustainable. Thus the implementation of sustainable development on the ground requires the identification and establishment of SDUs.

The SDU is simply defined as “**the biophysical-socioeconomic setting for true sustainable development (SD) to have a good chance to succeed**”. Quite clearly, the inclusion of sustainable development in the SDU concept and what it takes to attain it, must be deliberate and not just coincidental! Similar concepts include: IAD, model forest and their variants.

A real-world SDU would likely be a set of watersheds/ecosystems from the mountains (divides) to the coastal areas and the intervening areas in between, e.g., a river basin or sub-river basin. It could also be a small island, a group of small islands, or, a mix of areas on both sides of a divide in the case of long narrow islands and similar areas. It could also be land-locked.

Dealing and working with multi-LGUs and multi-sectoral interests/multistakeholders in the SDU is a common reality since sustainable development requires the unity, consensus, cooperation and convergence of multi-stakeholders and multi-interests. In other words, sustainable

development at the SDU level is, by its very nature, multisectoral and must be **locally driven**: local initiative/support/collaboration and based on local capacity/ resources/ needs/ priorities/ realities/ constraints.

#### **The SD System Model (SDU level)**

The **SDU development system** can be depicted in its simplest form as shown in **Figure 1**. This serves as basis for strategic planning and specifying the “collaborative framework” for the stakeholders to actively pursue sustainable development at the SDU level. As shown therein, the **core system** consists of the various interrelated major sectors/clusters of industries/services including:

- **watershed/forest management with downstream industries** such as: watershed/ forest products harvesting and the forest-based industries (lumber products, panel products, poles/piles, furniture/ handicraft, nonwood natural/forest products, pulp/paper, fuelwood); environmental services; ecotourism; water utilization systems
- **agriculture and the agri-based industry clusters** like: rice industry cluster, coconut/palm oil, sugarcane, export fruit crops, industrial crops (coffee, abaca), vegetables/legumes/root crops, ornamentals, corn/feeds and livestock, pasture/ruminants; or, any more relevant way of classifying/grouping them
- **fisheries/coastal resources/aquaculture and related industries**
- **other industries/sectors** like: mining, garments, housing, footwear, etc.; where applicable; any industry cluster may take a more prominent place in the core system.
- **social services; utilities; trade and commerce**
- **market systems**
- **waste management system(s)**
- **MOTHER NATURE: THE ENVIRONMENT** whose integrity/ status is affected by all the above and other human activities/ interventions as well as natural processes/events

The other component systems of the SDU development system include the:

- **the foundation for development (resources/factor endowment):** human resources, natural endowments (land resources, biological



resources, water resources, minerals, climate/weather, environment), capital resources and financing, Technology and R & D capability, physical infrastructure, business and policy environment, and institutional systems

- **supplier industries/sub-sectors**
- **other related and allied services/industries**

#### **Implementation System (SDU level)**

The implementation system of sustainable development programs at the SDU levels has 5 major components as follows:

- Continuing IEC – for total transparency of agenda, plans, decisions, results, events, problems
- Stakeholder Collaborative Framework and Articles of Collaboration
- Integrated Sustainable Development Plan (SDU level): sectoral/ cluster plans are integrated to consider interactions, cross-cutting issues, priorities, constraints, externalities
- Action plans
- Implementation, Monitoring and Evaluation

Sustainable development at the SDU level is by nature multisectoral and must be locally driven: **local stakeholders' initiative/support and based on local capacity/ resources/needs/priorities/constraints!** It is the local stakeholders who bear the brunt of environmental disasters when these occur, hence, it is only fitting that they have the say on how to develop and conserve the environmental resources and be the primary beneficiaries of the fruits of development and conservation.

The local stakeholders may be grouped as follows:

- LGUs: Provincial government, Municipal governments, Barangays
- National Government Agencies
- Alliances/other clusters
- Forest Area Tenure Holders (TLAs, CBFMAs, IFMAs,)
- Farmers Associations/Federation
- Fishermen's Associations/Federation

- CADTs/CADCs, other IP organizations
- Cooperatives
- Trade/Business/Financial firms
- NGOs, POs, ...
- Professional Organizations, Academic Institutions
- Others (e.g. the Youth, the general public)

**Organization and management.** – Very briefly, the organization and management system for implementing sustainable development at the SDU level includes the following bodies/entities:

- SDU Council (sectoral representatives/signatories to the Articles of Collaboration)
- Council's Standing Committees
- SDU Board of Trustees and Officers
- Community Development Corporations with Sister Conservation Foundations

**Other Comments:**

It may not be a part of my assignment but I totally agree with total privatization of rice importation; even limit importation to the rice-deficient areas; why make rice sufficient/ surplus areas suffer from the costs/ externalities of importation!!?? In fact, I see no justification for rice importation at all! We only need to reduce our waste in harvest/post-harvest and in eating habits, limit our consumption to our calorie needs, or we can eat other carbo-foods!

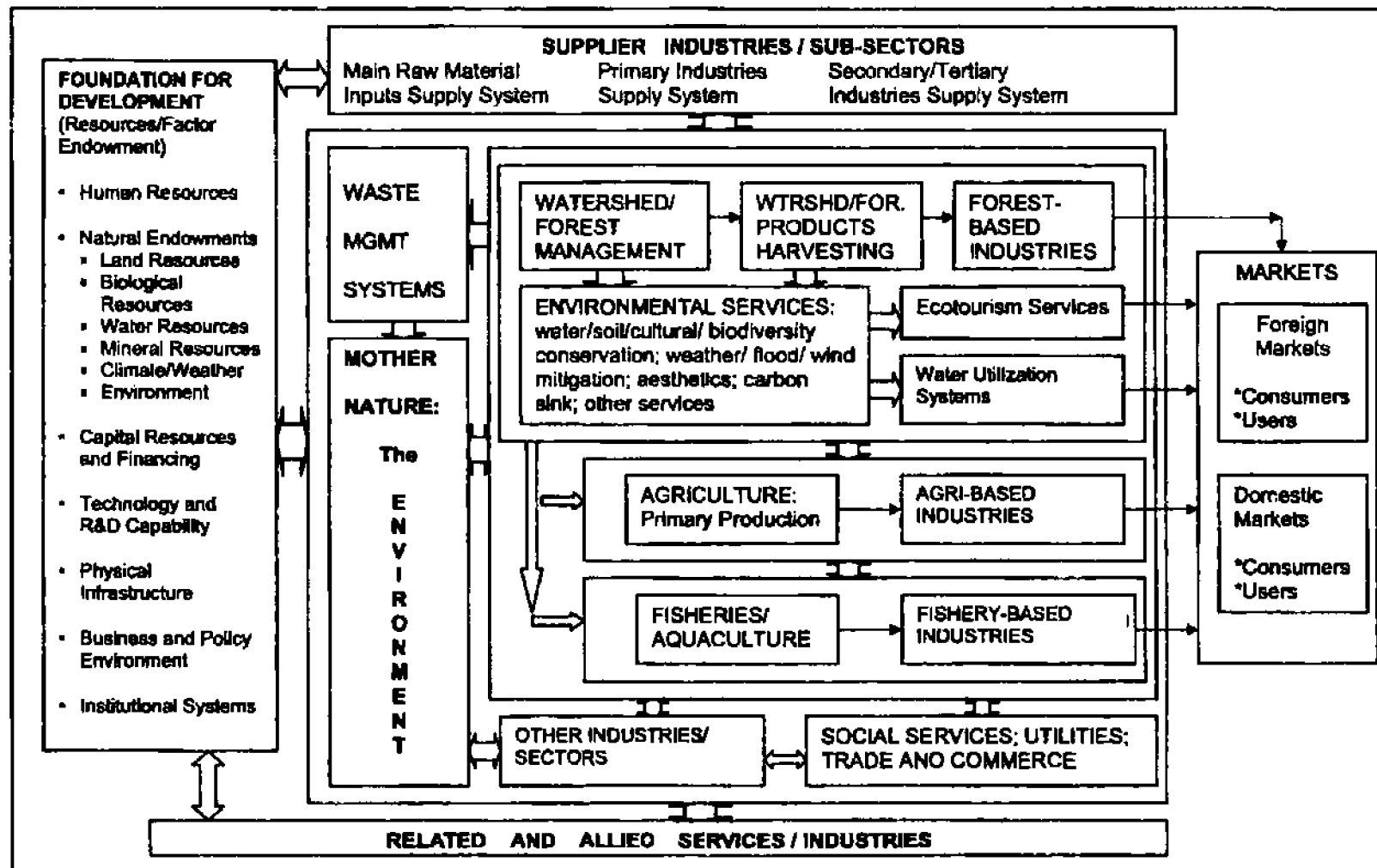
**Subsidies.** - Are subsidies really necessary? Subsidies must be economically justified Where subsidies are justified (small farmers' subsidy), the problem is where to get the money: importation tax/sin taxes, other sources. When necessary, subsidies should be managed to generate revenues as well as teach the beneficiaries to respect their responsibilities: provide subsidy coupons upon payment of taxes and fees.

Incentive system for reforestation, watershed rehabilitation, private forestry: tax exemption/rebate – tree farmers, oil companies, power companies, individuals who can afford.

Many existing wood processing are old and inefficient; on the other hand, veneer and plywood processing plants employing efficient technologies (70% recovery as opposed to the old 45 to 50%) already exist in Butuan, and Davao.

With respect to governance reforms, how about election reforms? This may be a wild idea but while doing “chacha”, consider a form of democratic/representative type of government that entails cheaper, more manageable elections.

- Limit general elections at the Barangay level where sectoral officials are elected by the people
- Barangay sectoral representatives then elect the Barangay Chairperson, ViceChair and the SB sectoral members
- Barangay Chairs and SB sectoral members elect the Mayor, Vice Mayor and the Provincial Board sectoral members
- Mayors and Provincial Board elect the Governor and Vice Governor
- Mayors and Governors elect the sectoral members of Parliament



jwv/30nov2004
 ↔ some interaction
⇒ some influence
→ sequential relationship



## **PHILIPPINE AGRICULTURE 2020 AND THE ENVIRONMENT**

### **OPEN FORUM**

**Dr. LS Sebastian:** I commend the writing group and appreciate its adopting the agro-ecological system as a framework in the PA 2020. I also agree with Dr. Padolina that when we talk about sustainable development and sustainable agriculture, most of it is just a philosophy rather than a well-defined framework and this is where I would like to make my comment. With PA 2020, I'm just wondering if we can make that framework more attainable in 2020. Can we set some parameters or measurable targets by the year 2020? Our Philippine agriculture is really moving towards a sustainable agro-ecological framework. For example, can we set measures on carbon emission etc. How can we translate that in our Philippine agriculture so that in 2020, the country can be compliant with the Kyoto Protocol. I think this is the definition of agro-ecological framework and sustainable agriculture is a continuing struggle for us and making it work on the ground is really very difficult. But I think, with the 50 academicians and national scientists, you have experiences of more than 30 years in research and development, you can probably give us some guidance in the future. I hope this will not be again another assignment for us the next generation to work on. Maybe you can give us some ideas on what should it be to say we are indeed following that agro-ecological framework. What do we have to attain, what measures? Not just practices, because we have so many practices but I do not know whether such practices are contributing to sustainable agriculture. The use of organic fertilizers, for example may be attainable in the short term, but I do not know if it is sustainable in 10 years or 30 years of just organic agriculture.

What are the sub-parameters for measures that we have to attain? I think, we cannot attain these overnight. How many of our farmers should be moving into organic agriculture and in what way? By 2020 what level should we be?

**Academician AC. Alcala:** Let me give specific examples and observations on coastal areas. The plan calls for more protected areas. You can quantify that. For example at this time, we have 20 million ha of coral reefs. Of

these only 22,000 sq. km. constitute the protected areas, or about 10%. We can put indicators, targets for these reefs and then quantify the amount of fish that can be generated by protected areas. This can be done because we have preliminary empirical data to base these projections on.

**Dr. A. Revilla:** About benchmarks, when we say sustainable, you have to have benchmarks. At the local level, we now have a set of C & I— Criteria and Indicators for sustainability. The present set has been approved by a UN body, the International Tropical Timber Organization (ITTO). But this is for the forest management system, sustainable forest management. The project that we are presently conducting is going to expand, test, expand and revise if necessary the set of criteria and indicators for sustainability at the SDU level. I think one of the best indicators could be water quality. You can drive along the rough roads of Surigao del Sur, for example, and see clear water despite signs of environmental degradation. Just after a heavy rain, you see some kind of turbidity, slightly different from one river to another. Those are the areas whose upper watersheds have licenses that have been cancelled. Nobody is protecting the area anymore. So we look for water quality as good indicator. I do not have the list of indicators here which is a long one but I will provide with you a copy if you want.

**Academician. EQ Javier:** In fact that is one of the innovations of this framework. Because in the past planning exercises, we have been looking only strictly at the agricultural systems and we usually know what we have in mind. As indicators of progress towards our objectives, since this framework encompasses ecosystem services, it is incumbent if I ask to indicate or define what those measures are and this is the reason why, the clusters are having difficulty because we have not been used to looking at ecosystem services. In the first place, many of us did not even know what it means by that, much less measure. So that's part of the work in progress. We have to agree on those kinds of indicators and be able to measure them. Jun Revilla said water quality at the mouths of major rivers. Yes, those are very good measures of how much soil erosion is happening in the uplands. Using satellite pictures of the forest cover of the country, we have now some indications that in fact maybe our programs are succeeding after all because the cover of the Philippines is improving from the latest satellite picture. This is a part of the continuing challenge for the clusters and the sectors to agree on how do we define ecological services and how we measure them. Thank you.

**Dr. Leo Gonzales:** I am the designated chair of the main report writing panel. My role is to be quiet and get the inputs but I think cannot help but to

speak now. You see for the first time, we're looking at a holistic approach to sustainable development. This session takes into account the environmental component but it is just one of those that we talk about in the national development goals. We are looking at the interaction effects of the set objectives of 2020 and, therefore, at the end of the day, we would like to look at a logical framework by looking at these things.

But our bread and butter will still be the industry clusters, because that's where the action is taking place. This is also why Dr. Revilla, a member of the writing panel wanted it to be implementable at the community level. Now if you look at the three pillars by which we conceived PA 2020, interaction effects are evident. You cannot isolate just sustaining the environment per se because there are trade-offs with other objectives of food security, global competitiveness and the other major goals of the plan. It would be nice to local trees, forest and air but if the business side of agriculture is not taken care of, that is not sustainable development. We took this into consideration in trying to operationalize for the first time the MA concept or ecosystem medium assessment goal, and that is where we are today. Again as Dr. Javier puts it — this is work in progress, and we need all the help we can get. But the challenge is really to develop the objective verifiable indicators that will indicate the progress at the cluster level. At the cluster level, we estimate that the work is only 60% finished, so we have a lot things to do here and the questions like those posed by Dr. Sebastian are very good input to the planning process. Thank you.





## **Information and Communications Technology for Philippines Agriculture**

### **FOUR PROPOSITIONS FOR AN ICT FRAMEWORK**

**Eliseo R. Ponce**

Visiting Senior Research Fellow

Philippine Institute for Developmental Studies

At the outset I would like to express my thanks for asking me to make comments on the PA 2020. I went over the volumes that were given to us and I see that in all the volumes, the importance of ICT in the overall policy strategy was evident. But I thought that besides all the statements distributed throughout the document, there should be a separate chapter or volume on ICT and agricultural development. And I have some suggestions on how this should be developed.

I have four propositions that could serve as a framework to develop the ICT: (1) First, agriculture, like any other industries, will become more knowledge-intensive in order to produce more with less. New tools of science make this possible. (2) Knowledge-intensive agriculture requires efficient knowledge management and ICT is critical to this. (3) Knowledge management is central to people, organizational empowerment. (4) The goal of ICT is to empower individuals and organizations.

In the first proposition, we see drivers that should force us to change: first, the rising consumer demands for food safety, enhanced environmental sustainability and food quality. The second is the rapidly expanding science and technology and the third is the global competition and farm subsidy. Thus, we have to change from resource-intensive agriculture to one that is knowledge-intensive. Farmers must learn to manage the same or fewer resources and be more sophisticated and efficient to increase productivity and profit in a sustainable production system. And I think that this is the challenge for PA 2020. We need to reduce poverty and improve the livelihood of the people in the rural areas. The key to this is really is farm management. I hope this can be well expanded in the PA 2020 as agriculture becomes

more knowledge-intensive, farm management becomes more complex and even more critical for success. Leveling-up farm income and its variability are highly influenced by all farm practices and circumstances and are not entirely the results of factors beyond the producers' control. And fourth, effective management information and resources is the foundation of knowledge-intensive agriculture. I hope that this could be more highlighted in the PA 2020.

The second proposition is that knowledge-intensive agriculture requires efficient knowledge management and ICT is critical. Knowledge management is the foundation of developing all concepts of learning and innovation and change. I wish to say that the agricultural bureaucracy must have a culture of learning and innovation to infect the farmers, so that the farmers develop a culture of learning and innovation. This sort of relationship between the DA bureaucracy and the farmers need to be well articulated in the document. Moreover, central to change management is that we have to change organizational culture, not only in the DA but the rest of the government. And central to this is knowledge management and therefore the cornerstone of excellence in governance. We wish to look at ICT as a tool of knowledge management, and knowledge management is central to achieving excellence in governance, so when you talk about transparency, accountability, productivity and participation—these are the more important objectives of knowledge management and organizational report, key to achieving competitive advantage in agriculture sector.

The third proposition is that knowledge management is central to people, organizational empowerment. And I think we can relate that to EDSA 1. People learned about EDSA 1 through the fax; at that time there was no text yet. And now text is so important, and text is the way people interact with one another. We talk about databases; databases are difficult to retrieve if you are from the rural areas. Now we talk about ICT to enable people to interact, to empower them. ICT to be more effective should be looked at as an empowerment tool, and I think it is the key message that we should drive at especially in this country. Let me illustrate this. We look at LGUs, agencies, private sector and the DA— you need to empower these organizations in order to serve more the farmers and the fisherfolk. Central to knowledge management are three things: (1) the ability to work together, (2) to share experiences, (3) to share knowledge, and (4) to learn with each other. When you are talking about farmers' growths, fishermen's growth, organizations, there should be processes and programs that will allow them to work with one another, share experiences, share knowledge and learn

from one another in order to gain knowledge and wisdom. And where is ICT here? ICT is a facilitator. It is not an end by itself. Many organizations have computers which are just expensive calculators and word processors. They are used by people to interact with one another. So we have to move beyond this paradigm of computers as expensive calculators and word processors but rather as a tool to communicate with one another.

The fourth proposition is that the goal of ICT is to empower individual and organizations. The three elements that need to be addressed in ICT policy which I hope will be taken in more detail in PA 2020, are structure, people and culture. You may have computers, you may have cell phones but the structure is antiquated and the people are not trained in order to use them properly. But remember the technology game plan is mainly in support of a bigger game plan on people empowerment. Here is a framework which we use in knowledge management. First we are so concerned with raw data, facts and numbers, but we have to go beyond that. We have to share information, data input into context but higher than that is, of course, knowledge information combined with experience, and the highest we would like to be able to share is especially the most difficult, which is wisdom. If you divide these two hierarchies, information and data are readily captured in documents, databases and are easy to retrieve. This is the usual use of ICT. But I think ICT should now focus on the upper level which is to share knowledge. How do farmers or people in the organizations share their wisdom so we do not have to learn from the beginning? In agriculture we talk about best practice, in organizations we talk about best practice, but many of these best practices remain to be best practice learned only in one location. You have to ensure that the best practice in an organization or in a farmer's field gets to be shared and that should be an important objective of knowledge management and central to this is ICT.

AFMA signed in 1997 had identified ICT as a tool for modernizing agriculture, but up to the present, it remains to be an elusive dream. Know why? Structure, people, culture, systems, processes, technology, these are the more fundamental problems we have in implementing this. I think the chapter or volume on ICT should discuss and analyze this situation incisively.

And this is what I recommend for this chapter on ICT: (1) develop a full chapter or volume on knowledge management of ICT on agriculture development. This volume should start with an incisive analysis of the role of ICT in knowledge management; (2) articulate an integrated and coherent ICT policy. The current statement in the PA 2020 is so broad, it does not have a handle which you can take with you and implement. On the part of

the lawmakers, for example, or on the part of the DA, they will need a handle to be able to bring the ball forward. Such policy should define how ICT can play a more catalytic role. Right now, DA has a culture of centralized planning; it has to move away from that. And then it has to have a detailed investment plan on knowledge management on ICT during the next 15 years.

A good model to look at is Canada. The title of their plan for Canada is: "Putting Canada First." This shows the very clear investment by the Canadian government to make Canada first in agriculture. It also gives a clear statement of goals and measures on how to achieve these goals. I wish that we could take some lessons from Canada as well as the United States Department of Agriculture as we define PA 2020.

A few comments on the PA 2020 which I was not able to give yesterday, I wish that these missing chapters or volumes will appear in the final edition— new tools of science and how science will address the issue of food security, poverty alleviation, peace and security. Infrastructure development should be broadened more than the way it is defined in PA 2020 which looks only at the physical structure. The more important structures we should develop are institutions. Institutions in this country, especially government institutions, have been compromised, in fact destroyed because of politics and we need to repair them. Reinvest in people and in the organization so they can do what they are supposed to do.

I also propose a separate chapter on knowledge management. To make technology a tool of development, technology must be at hands of the people who need and use them. That is the function of knowledge management. And the third, the role of the government and partnership is, the government for the last 10 years has taken the role of the private sector. They have used the vital resources to duplicate what the private sector is doing. The PA 2020 should define the role of government versus that of the private sector, the civil society within the framework of new institutional economics on public management. And I wish this could be well articulated. What should be the role, for example of DA vis-à-vis the LGU in the promotion of ICT in partnership with the private sector at the local level? And in effect there is good governance in agricultural bureaucracy. It has been shown that government can reduce transaction costs and it can influence up to 15% of the performance of the economy. I wish this could be well articulated because in the secretary's discussion yesterday, he says government should play a catalytic role. How we should do that?

Thank you for this opportunity and good morning.

**Information and Communications Technology for Philippine  
Agriculture**

**THE NATIONAL INFORMATION NETWORK OF THE  
DEPARTMENT OF AGRICULTURE**

**Roberto G. Villa**

Director, Information and Technology Center for Agriculture and Fisheries  
Department of Agriculture

I have noted that the discussion in the use and application of ICT in support of agriculture and fisheries development in the PA 2020 document was very limited. These limitations indeed are a challenge to ICT in a sector where it is used mainly or regarded as an enabling tool in support of a sector's modernization rather than as a catalyst for a sector's development. Let me brief you on the National Information Network (NIN) which is being presently implemented by the Department of Agriculture (DA).

The Agriculture and Fisheries Modernization Act (AFMA) of 1997 mandated the DA to set up a national information network. This is the enabling mechanism that links the department to the regional, provincial and municipal levels as well as provides our stakeholders ready-access to agriculture-related information on technology, market, and prices among others. This mandate is further elaborated in the national mobilization plan which was approved in 1998. The plan focuses on three major implementation requirements. Basically these are: information systems that were prioritized by a group of consultants, the required network infrastructure and the required institutional aspect to implement NIN. The law stipulates the provision of P800 million for the first year of its implementation and about P700 M per year for the next succeeding three years. Unfortunately, less than 5% of the total proposed budget of the program was actually released for its operationalization. With this limited amount, however, the DA was able to establish and operationalize its communication structure. It was able to link all regional offices as well as establish two remote sites, one at the Philippine Rice Research Institute (PhilRice) in Muñoz and its office at the University of the Philippines Los

Baños. All the DA's bureaus and attached agencies within Metro Manila are linked by leased lines. However, the implementation of the needed information systems has lagged behind. This budgetary constraint has been further compounded by the fact that there is no formal unit in most agencies of the department to manage and administer the IT databases as well as IT resources. All are actually operating on an ad hoc basis. However, the department continuously explores some options in improving its services with the use of ICT, particularly, in the delivery of its final outputs.

Let me inform you of some of our initiatives right now. In the DA's performance of its regulatory functions, the aim is to computerize all existing manual procedures in the issuances of permits, licenses, certifications and other related instruments. This is in response to the call of the public for a more transparent transaction in the government. Starting next month, we will be developing an on-line import permit application to be piloted in four DA regulatory agencies namely: BFAR, BAI, NMIS as well as BPI. In the marketing assistance/support function, we hope to launch next month an electronic commercial portal for the Philippine agriculture and fisheries sector. This is consistent with our goal of transforming our existing website to a more dynamic and interactive one and providing ready access to the farmers and other stakeholders in the agribusiness sector of the much needed timely, relevant market and price information. In support of its extension function, we are supporting PhilRice in implementing an open academy for agriculture establishing a key learning facility project focused on rice and to be piloted initially in five provinces. We hope to expand this to cover other crops as well.

Corollary to this, we are presently collaborating with the University of the Philippines, the Commission on Higher Education, and the National Library in establishing the e-library project. Although this will not directly benefit farmers, however it will provide support to agricultural researchers, technicians as well as academics involved in the sector.

To supplement the effort of DA in its information dissemination, we have recently forged an agreement with Globe Telecoms in the application of SMS technology. The idea is to build a community of texters among stakeholders, wherein each sector can share information on all aspects agriculture, including prices, problems or issues, and comments affecting the sector. Recently, we launched with PAGASA, ULAT PANAON and ULAT DAGAT. This is now available through the Globe mobile service using the number 2256. We also launched the DA *Presyo*, which provides

retail prices of selected commodities in Metro Manila on a daily basis. We intend to expand coverage to include other major trading and market centers nationwide. In support of these information services, we are also looking at the possibility of setting up call centers as well as information kiosks in major production and trading centers.

In the planning and advocacy function we are developing our GIS capability to further enhance our physical planning capability in the determination of priority rural infrastructure and in the identification of additional two million hectares of land for production expansion. We hope to consolidate all these information into a database repository or the NIN Knowledge Center. The NIN can facilitate the exchange and sharing of information and other allied databases among the DA data users. This is a challenging task considering the fact that DA has about 45 agencies nationwide.

Finally let me assure you that DA is supporting the NIN, by integrating its components in the regular programs and budget of various agencies of the department. We will continuously design new programs that will leapfrog the DA well into the ICT age. Thank you.





## **Information and Communications Technology for Philippine Agriculture**

### **ICT THE ENABLER**

**Academician William T. Torres**  
President, Mosaic Communications, Inc.

One of the things mentioned by the first panelist, Dr. Ponce, is to put more substance, more elaboration in PA 2020. As he explained, ICT is a facilitator. I would like to elaborate on this. I consider ICT as an enabler of many things. Examples of this would include the successful integration of ICT with business processes, decision making, knowledge management, etc. My position is that we can speed things up if we use ICT more effectively. For this afternoon, I would like to focus on how we do these things because different people have different ways of looking at things they want to do and different ways of implementing what they want to do.

Most people, including myself, are already happy with the computer and access to the Internet. If this is all what we will do, the digital divide will continue to exist between us and many of the farmers and fishermen as well as the knowledge workers that provide assistance to this very big segment of our society. Therefore, I propose that we dichotomize the way we look at ICT. One aspect has to do with infrastructure. As an analogy, for example, we ask: who worries about building roads, bridges, farm roads, etc.? Not us! There are other people, other groups who worry about these infrastructures. Therefore, one of my recommendations is, when it comes to setting up ICT infrastructure, let us outsource it to the ICT industry sector so that we can worry about the second aspect – which is, mainly, the applications of ICT. To repeat, I recommend that we dichotomize the way we develop ICT as an enabler of PA 2020 by looking at, on one hand, infrastructure, and on the other hand, applications. We can, therefore, work at the same time — different people working on different things.

Let me explain a bit further what I mean by ICT infrastructure. Infrastructure, just like any kind of infrastructure, is shared by many. It is meant to be developed for all. For example, in our previous analogy, our

roads, our transportation systems are developed for all, not just for agriculture, not just for trade. In the ICT sector, we also need to take a look at infrastructure as infrastructure for all. Agriculture will be one of the many users of this infrastructure in our country.

In the development of this infrastructure we recognize that there is a hierarchy of components. The hard infrastructure is telecommunications. These are installed by the telecommunications companies. On top of this are value-added service providers, and my own field of work belongs to that category; this group of infrastructure builders can be considered soft infrastructure builders. They provide the value-added services. We ought to explain in our plan what the role the value added service providers can play in the acceleration of the development of PA 2020. ICT allows us be flexible and responsive to the needs that change over time.

We all know that PA 2020 will certainly be a dynamic plan. The present version is the way we see things today; it will be different next year, 5 years from now, 10 years from now, and so on. What will be the difference? To me the two factors that will make it different would be the society or the communities that are impacted by this plan, on one hand; on the other hand, we have the tools or the technologies that can provide more effective means to implement what we want to happen. So, we must have flexibility in our plans. To give you an example, there are many people who think that using cell phones will already empower our farmers and fishermen. Of course, it will enable them to communicate with each other? But without other components, such as what they can get from information systems and knowledge systems, they will not be exchanging information towards being more productive, towards being better planners.

Now let me focus more on what, in fact, ICT can do for PA 2020. I have three categories: The first one is providing access to ICT and ICT-enabled applications. There are things we can already do today provided that we have the means to do them. We don't have to wait for the DA, UPLB, or some other institutions, to give information or to broadcast that information to us. Instead, we will be able to access and choose what we need, what we want; these applications are available from many sources. Thus, access is very important and this can be used right away. The only thing we have to do is to teach people on how to access information this makes them ICT literate. The recently held World Summit on Information Systems considers being ICT literate as more important than being information literate. This is the key idea to be able to make use of the information that is available and that can be accessed.

I believe that the next category should address is the empowerment of knowledge workers. Dr. Ponce already indicated this. It is not enough to access information as an individual, do things on your own. We have to work as groups, as teams, as communities, and therefore we must have the means to communicate and we must communicate as informed participants in any group activity. Thus, the empowerment of DA workers is important if we are to help the millions of farmers and fishermen in our country. They must be empowered to do things on their own without having to wait for instructions from above. This empowerment will come from their knowledge and from their being able to cooperate and help each other in doing their work for and with their beneficiaries.

The third category that can be achieved with ICT is being able to modernize existing enterprises and organizations, not just government, not just the private sector, but educational institutions and other entities that are also stakeholders in the agri-business sector.

The above three things are what I think would give us a handle on how to harness ICT in order to improve the way we plan and the way we do things.

One of the things being undertaken by the ICT industry sector is the Community e-Center Program. This multi-sector program is an initiative of the government, the private sector and the academic sector – the idea started during the time of Information Technology and E-Commerce Council of which I was a member then. The main idea in this program is to have nationwide infrastructure which has three components. The first component is to put up Community E-Centers in the barangays. The second is telecommunications that will provide broadband connections to these barangay community e-centers. Anywhere in the Philippines, you can do this already; it is just a question of being able to sustain it or make it viable as a business entity. Let me repeat, you can do this – set up a community e-centers with broadband connectivity — for any barangay. However, to make this worthwhile, you must develop applications and services that can be accessed by these barangays. This is third component. Many people in the barangays will be willing to pay a small amount, for a service such as voice over Internet protocol (VOIP); if we could lower the cost of international calls to one-tenth of what it costs today, I believe people will be willing to pay for such calls. In my opinion VOIP is an important service that must be available at a community e-center. Some other important services are access to applications provided by education, by health, by the agricultural sector. These applications need to be developed at the national level. Then

we need to teach people in the communities how to make use of these accessible resources. This scheme of implementation will make the Community E-Center Program viable and sustainable.

Let me end with what I think we can do by ourselves with the PA 2020. We have statistical data bases and the information services that we have been discussing in this forum. I think that we need to provide technical and financial assistance, if necessary, to local government and community organizations on how they can make use of these resources through appropriate ICT applications; we need to help acquire the tools that will enable them to do these things at the a community level. For example, nobody can afford to buy licensed Microsoft Word software because it is very expensive for the lower level organizations. Therefore, what we need to do is to develop an equivalent software that is almost free, if not totally free.

This is my last point: We must outsource the development of the ICT infrastructures to people outside of PA 2020. However, we must influence the way how these infrastructures are to be developed. As a document, I believe that PA 2020, when shared with other sectors, will influence what these sectors will have to do.

Thank you.

## **INFORMATION AND COMMUNICATIONS TECHNOLOGY FOR PHILIPPINE AGRICULTURE:**

### **OPEN FORUM**

**Dr. N. Bantayan, UPLB:** I'm interested in the infrastructure based on the talk by Dr. Torres. What are your thoughts in terms of open source systems or software against the proprietary ones that, as you said, cost so much, if you want to develop the ICT infrastructure in the country?

**Academician W.T. Torres:** Quickly, technology should be open. It is up to the user to determine whether he can afford Microsoft, for instance, versus Linux. However, looking at the agricultural sector, I already mentioned that many people in this sector may not be able to afford expensive software. So the open source initiative I think should serve that particular sector. The idea is not to develop softwares that are very sophisticated. A Microsoft packages has 10 million lines or more; perhaps the farmer or the fishermen only need software with 10 thousand lines or less. Perhaps we can lower the cost by simply focusing on the needs of the sector. The answer is we need to develop our own. When we say acquire software tools, I don't mean we buy them necessarily from foreign suppliers. We can get these tools from local software developers. Incidentally, we'll be helping the local ICT industry by doing this.

**Mr. Ronald Tallo, MAPECON Green Charcoal:** I'm a member of the Filipino Inventors Society. In PA 2020, I think the so-called e-commerce was not touched and this particular subject should be part and parcel of the information technology wherein all of the products in the Philippines could be exported using computers and payment through credit cards or debit cards. You also mentioned VOIP by which we can call the United States at PhP1.07 compared to PLDT cost of about PhP22.00. We could use the VOIP in the Philippines using the DSL modem or dial-up connection. Thank you very much.

**Academician Torres:** I'm quite familiar with the two things you mentioned. My assessment about domestic e-commerce is that it is not yet mature. It is not even in the embryonic stage at this point in time. E-commerce will prosper if there is demand for it. However, what is promising is an e-

commerce scheme wherein the seller is in the Philippines and buyers are outside the Philippines. A good current example is call center agents based in the country and providing services outside the country. The other thing I want to add is that e-commerce is sometimes perceived as B-to-C -- business selling to consumers. E-commerce has many other different features such as that in B2BPriceNow.com. This e-commerce Web Portal allows farmers using their mobile phones to know what the prices of agricultural goods are anywhere in the Philippines; they can also post their own prices on these portal. This feature of e-commerce has been running for a few years already. It was an ICT application that had won a World Bank award.

In regard to VOIP, a few more months from now, we expect the National Telecommunications Commission to issue a policy that would make VOIP available more widely in our country. Today, we can make use of VOIP already. Using a computer we can make calls outside the Philippines for a small fraction of the prevailing price, or even for free, depending on what we do. However, the unfortunate thing is, people from outside calling us will have to pay a lot more. At least 12 US cents per minute will be added to that service by the telecommunications company concerned. This is the cost component we are trying to have reduced. We want to reduce the cost of voice call termination within the Philippines which is bundled together with the international transmission of that call. We want to unbundle the two cost components because we can use VOIP for the international component, at low cost, and combine this with the traditional domestic long-distance call, the cost of which we're to pay. The moment we do this, I think it will impact the countryside because VOIP will enable more and more people to afford making international calls -- outbound as well as inbound calls. It has significant implications not only among OFWs and their families but also in business. Thank you.

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