# Priorities and Constraints of Postharvest Technology in the Philippines

**Silvestre C. Andales* and Engr. Michael A. Gragasin***

## Abstract

Although the Philippines is an agricultural country, it is not self-sufficient in its staple food requirements. The country is 5 to 10 % short of its rice and corn annual needs. It also shows a low per capita consumption of fruits and vegetables. Moreover, postharvest losses are high: about 15 % for grains and 30% for fruits and vegetables.

Some of the major constraints in the development of postharvest technology are as follows: lack of R & D budget (less than 1% of GNP), lack of infrastructure support, small landholdings of farmers, weak farmers' organizations / cooperatives, and lack of government policy and implementation.

To develop its agriculture, the country adopts improved technologies for both production and post-production operations. Research and development, training, extension and commercialization of postharvest technologies, postharvest facility assistance through soft loan credit to farmers' organizations/cooperatives, and government assistance to encourage the private sector investment in food-processing and marketing are some of the priorities in the development of the postharvest industry.

Recently, the Ramos administration has enacted the Agricultural and Fisheries Modernization Act (RA 8435). This law specifies that P120 billion should be allocated to modernize agriculture in seven years, effective 1999. The major components are as follows : 30% for irrigation, 10% for R & D, another 10% for infrastructure, and 10% for postharvest facilities.

## Introduction

The Philippines, covering an area of 115,739 square miles and with a population of 70 million people, is largely an agricultural economy. Seventy percent of its people depend on agriculture.

Eighty percent of the population eats rice and the remaining 20% eats corn. However, for almost two decades now, the country has not been sufficient in its staple food requirements. Five to ten percent of the staple food requirements are imported from other countries every year. Meanwhile, the postharvest losses in rice and corn amount to 15% and 13%, respectively. Problems like wet grain handling, mycotoxin contamination and pest infestation are problems still plaguing the country's postharvest industry.

While traditional crops such as rice, corn, coconut and sugarcane occupy a large area of farms that are tilled by the majority of Filipino farmers, other crops like fruits, vegetables, and industrial crops present alternative income opportunities. Fruits and vegetables are now

* Bureau of Postharvest Research and Extension (BPRE), Department of Agriculture, Philippines.

recognized as high value crops with excellent domestic and world market potentials. However, the local fruit and vegetable industry fails to take full advantage of these potentials. Problems like lack of skilled and knowledgeable farmers, extension workers and other agricultural workers, limited access to markets, and pertinent trade and market information, inefficient technology and poor transfer of available technology to farmers, lack of efficient infrastructure system, and limited access to credit constrain efforts of the industry to penetrate the world market.

To sustain the country's agriculture, the government implements limited research and development activities, a fragmented training and extension program, and subsidized commercialization of improved agricultural technologies. Due to the limited budget, infrastructures in agriculture are lacking. By adopting the free market and private sector-led policies, the government is trying to encourage the private sector to invest in agricultural enterprises. Recently, the government has enacted a law (RA 8435 otherwise known as Agriculture and Fisheries Modernization Act) to modernize agriculture and fisheries by allocating P120 billion for the next seven years, effective 1999 with about 20% allotment for postharvest-related activities.

## Priorities in Philippine postharvest industry

There are four main areas of concern in the postharvest industry of the Philippines. These include : 1) Research and development, 2) Training, extension and commercialization, 3) Postharvest facility assistance, and 4) Government support to the private sector.

### 1 Research and development

The research and development agenda on postharvest technology spells out the areas which will be the focus of the development efforts for the next seven years (1999-2006). These areas include modernization of the postharvest sector, development of postharvest infrastructure, and the upgrading of postharvest research and development capability.

**1) Modernization of postharvest sector**

The modernization of the postharvest industry will involve the establishment of baseline information, development of computer-based postharvest facility designs, development of quality standards for postharvest facilities, development of grading standards for fresh, semi-processed and processed products, development of efficient packaging technology for fruits and vegetables, mycotoxin prevention in agricultural products, development of integrated pest management techniques, development of new processed products and utilization of waste and by-products, mechanization of various postharvest and processing operations, and development of locally manufactured fully automated integrated processing facilities.

**2) Development of postharvest infrastructure**

Postharvest priorities in infrastructural development include the adoption of bulk handling system and cold chain handling as well as the establishment of technology demonstration centers throughout the country.

In the Philippines, unlike in the temperate countries where the operation and management system of grain bulk handling system is well advanced, the experience in using the bulk

handling system is still limited. There is a need to develop socio-economic, technical, and operational conditions for the management of the bulk handling system to ensure its successful adaptation in the country.

Secondly, this is an opportunity to put premium quality products in the domestic market in consumption centers in the Philippines. The markets for premium products provide the opportunity for introducing the cold chain handling system in the country.

Lastly, the farmers' organizations will be encouraged to become engaged in the postharvest handling and processing operations as well as in the marketing of their own produce. The establishment of Technology Demonstration Centers will serve as a venue for farmers' organizations to gain exposure and expertise in the proper operation and viable implementation of agro-processing-based enterprises.

**3) Upgrading of research and development capability**

With the enactment of Republic Act 8439 in 1997, otherwise known as Magna Carta for Scientists, Engineers, Researchers and other Science and Technology (S & T) Personnel, it is now the policy of the government to provide for a program on human resources development in science and technology to obtain and maintain the necessary reservoir of talent and manpower that will sustain the government's drive on total science and technology expertise. Along this line, the Department of Agriculture will use the expertise of research fellows from State Colleges and Universities (SCUs), and foreign research institutions to obtain updated information on latest postharvest technologies.

Research facilities will also be upgraded and the necessary support equipment shall be installed at the research institutions of the government.

Above all, a comprehensive postharvest research and development priority plan shall be formulated to set a direction in the overall implementation of research and development programs.

## 2 Training, extension and commercialization

The government recognizes the need to complement the efforts in improving the farmers' production efficiencies with the need to enable them to have full control over the acquisition, management and disposal of their crops and resources to make farming truly profitable. Therefore, the outcome of Research and Development (R & D) has to be promoted and commercialized actively. The cognitive appreciation of the benefits of improved practices and systems has to be internalized and translated into real actions of technology adoption.

In this regard, the government will actively implement the postharvest industry manpower program, communication support program, commercialization of mature technologies developed through R & D, the pilot testing/installation of computer software, and the provision of technical assistance to various persons involved in the postharvest industry.

## 3 Postharvest facility assistance

The postharvest facility and technology support program aims at strengthening and empowering farmers' groups by enhancing their postharvest knowledge and skills, and through aquisition of postharvest facilities, and technologies. Such capability empowerment will enable them to reduce postharvest losses and have a better leverage over the disposition and prices of

their produce. A phase development approach will be adopted. This calls for provision of postharvest interventions that match the particular requirements of farmers' organizations based on their organizational maturity, financial capability, and nature of activities pursued. This program will be carried out through the Agricultural and Fisheries Modernization Program of the government.

### 4 Government support to the private sector

The Philippines adheres to the principle of free enterprise and recognizes the indispensable role of the private sector in the promotion of agricultural and economic development . One of the policies adopted to strengthen the economic and financial systems is the privatization of business, which involves the transfer of government-owned entities to the private sector. Now that the government is modernizing the agriculture and fisheries sector, it has enacted several agricultural support policies, i.e. credit as embodied in the AFMA which aims at assisting private businessmen to invest in production, postharvest technology, food-processing and marketing activities.

## Constraints of the postharvest industry

In general, the Philippine postharvest industry is faced with several constraints. These include, among others, the following:

### 1 Wide economic gap between farmers and businessmen

The major recipients of modern postharvest technologies are usually traders and processors. The farmers, due to inadequacy of capital, cannot afford to buy appropriate postharvest machinery. Current post-production machinery and equipment require substantial capital and operating cost/ investments which make them unaffordable for small landowners. In addition, although price information is usually available to traders through informal channels, it is not accessible to small landowners. Thus, small producers cannot be expected to undertake market-oriented production programs under these circumstances.

Although the government has made utmost efforts to alleviate these shortcomings, the wide economic gap among farmers, traders and processors tends to persist.

### 2 Low adoption of improved postharvest facilities

The absence of a strong linkage between producers and the market can effectively limit the benefits that can be obtained from postharvest technologies. For example, hot water treatment (HWT) for mangoes which consists of dipping the fruits in water at 52-55 ℃ for 10 minutes, provides effective control of postharvest diseases in mango. At present, however, very few producers subject their harvest to HWT, because mangoes usually go through a marketing system that precludes this operation. Exporters procure fruits through buying stations which do not pay for the additional cost of the treatment.

### 3 Technical inefficiencies leading to PH losses

Technical inefficiencies arise from the usual problems associated with the lack of farm to

market roads, packing houses and cold storage facilities, appropriate containers, packaging materials and container vans. The inability of producers to sort their commodities according to size and quality leads to multiple handling and, consequently, greater losses. This can be attributed not only to the lack of facilities for proper grading and sorting, but also to the absence of workable standards.

### 4 Insufficient postharvest training and extension activities for other crops

Agricultural extension services have traditionally focused their efforts on traditional crops such as rice and corn, with little attention being paid to other agricultural commodities like high value crops, livestock and fisheries. The need to train agricultural extension workers in the field of postharvest technology is imperative to ensure that appropriate post-production technologies reach the farmers, fisherfolks, traders and processors.

### 5 Weak information system

The untimely delivery of information (i.e., technology, prices, etc.) to the stakeholders of postharvest industry has been a persistent problem which heavily constrained the development of the post-production system. Information on improved technologies and prices is not usually available to small landowners and farmers' organizations, which has resulted in their inability to become engaged in profitable production programs and equitable post-production system.

### 6 Failure of majority of farmers' cooperatives

In the implementation of the Medium-Term Agricultural Development Program in the country, the focus of development is on farmers/people's organizations. As such, the success of the postharvest development programs depends on the availability of qualified farmer cooperative-recipients. In the past, the Department of Agriculture has found it difficult to distribute postharvest facilities to qualified cooperators because of the limited number of successful cooperatives throughout the country.

### 7 Small landholding of farmers

With the implementation of the Comprehensive Agrarian Reform Program, the majority of the Filipino farmers are small landowners. With a small farm lot and limited volume of harvest, ownership of agricultural machinery or crop processing facilities among small farmers is difficult. The production cost incurred by the Filipino farmers is high compared to that of their ASEAN neighbors.

## Potential and opportunities for the postharvest industry

The following are some of the strengths and opportunities in the postharvest industry:

1 Since the agriculture sector aims at global competitiveness in addition to efficiency, sustainability and equity, a sound postharvest and processing enterprise for improved quality and productivity is required.

2 The industry must be motivated to become engaged in "leap-frogging" and "pole-vaulting" activities to shorten the gestation period for R & D and use relevant, location-specific and

cost- reducing or value-adding technologies, since the government has already identified new and relevant technologies as one of the major forces of change.

3 Rapid developments in information technology and telecommunications provide the opportunities for the country to catch up on or access new technologies applicable to the postharvest industry.

4 Since rice and corn are the staple foods in most of the Asian countries, there is a great demand for these commodities both locally and internationally. This should motivate the agriculture sector to strongly advocate and work for the development of mycotoxin-free products for a globally competitive grain quality.

5 The government underscores the need to ensure self-sufficiency in rice and white corn for human consumption. For self-sufficiency to be sustainable over the longer term, measures to increase productivity should be implemented from judicious management of the resource base. On the marketing side, producers should be able to obtain a good price for their produce which should readily translate into an affordable price for consumers. Thus, such a need gives the postharvest industry the opportunity to invest on postharvest facilities that will minimize, if not totally eliminate, postharvest losses and on processing technologies that will improve product quality and add value to agricultural crops for increased productivity.

6 The existing Postharvest Network provides an opportunity for synergistic and consolidated efforts toward the development of a modern postharvest industry.

7 Favorable climatic conditions and seasonal opportunities are conducive to the production of commodities for exports.

8 Stronger and increased private sector interest in expanding investments in food and agribusiness will result in more job opportunities and encourage the development of postharvest systems and technologies.

9 Trade liberalization under the GATT-WTO expands the market opportunities for Philippine products.

10 The postharvest industry should also take advantage of the massive rural infrastructure program being launched by the government that could provide opportunities for a larger number of technology demonstration centers. These centers would serve as avenues for massive extension deliveries to encourage a wider utilization of postharvest and processing technologies.

11 The Agriculture and Fisheries Modernization Law (RA 8435) which allots P120 billion to modernize agriculture in seven years, effective 1999, specifies that 40% is allotted for infrastructure, 10% for R & D and 10% for postharvest activities.

## Conclusion

Postharvest industry occupies a higher niche in the country's agriculture. The Department of Agriculture has made it a major prime mover in the realization of the goals of the Medium Term Agricultural Development Plan (MTADP or "*Gintong Ani* Program"). This re-focusing of strategy poses a big challenge to BPRE as leading agency of the Postharvest Component of the *Gintong Ani* Program for Rice, Corn and High Value Crops. It also highlights the critical

role of BPRE in the current efforts of the government to modernize the country's agriculture.

However, the vision of developed postharvest industry underscores the significant role of various stakeholders of the industry to ensure its success. Thus, the Department of Agriculture through BPRE will continue to "work in cooperation not in isolation" with the different sectors in the postharvest industry. Farmers, farmers' groups and cooperatives, local government units, government and non-government agencies/institutions and the private sector are thus united to give their full support in pursuing the priorities of the postharvest industry.

The present government is looking ahead with confidence, optimism and hope. In the future, strong linkages with partners and collaborators will further boost this confidence so that a developed postharvest industry could be achieved.

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