

Current status of the rural economy and measures for vitalizing it and increasing farmers' income in Indonesia: development of substantial *Gedong Gincu* mango plantations in West Java

Made Suidiana Mahendra^{1,*}, M. Suryadi² and Padmono N.³

¹Center for Research on Tropical Fruits (CERETROF), University of Udayana, Jl. P.B. Sudirman, Denpasar 80232, Bali, Indonesia

²Directorate General of Horticulture Business, Ministry of Agriculture, Jl. AUP No. 3, Pasar Minggu, Jakarta 12520, Indonesia

³Integrated Horticulture Development in Upland Areas Project, Office of Association for IHDUA, Jl. Salihara No. 1A, Pasar Minggu, Jakarta Selatan 12540, Indonesia

Abstract

The Indonesian population aged 15 years and over is about 61 million. Some 11.1% of these people are working in agriculture, forestry and fishery (third rank), while about 19.5% are working in community, social and personal services (first rank). Most (70%) of them live in Java, about 15% in Sumatra, and the rest are spread out in Kalimantan (5%), Sulawesi (5%), and other islands (5%). The number of agricultural households, based on the agricultural census in 1993, is about 21.5 million; the largest number is in Java, followed by Sumatra. Agricultural labor is distributed among the crops and horticulture, livestock and fisheries subsectors. The largest number of people in agricultural labor is in the food crops and horticulture subsector, which employs over 25 million, or 84% of total agricultural labor.

The total land area of Indonesia is about 192 million hectares, much of it very suitable for agricultural production. The area of land used for agriculture is only up to 66 million hectares, due to constraints such as high slope, low fertility and peat land. Nevertheless, agriculture remains one of the most important sectors in Indonesia's economy. Most of the people of Indonesia still depend on agriculture and agro-industry, especially for their food supply. Also, the agricultural sector currently contributes significantly to national foreign exchange earnings.

The economic crisis which began in mid 1997 has increased the number of poor people in Indonesia. The poverty line increased by 50% for rural areas in 1996, compared with the figure in 1993. It was reported that the poverty line in rural areas in 1996 was at an income level of about 27,413 rupiahs per year. By the end of 1998, the number of poor people had risen to about 49.5 million (24.2% of the Indonesian population). The number fell slightly in 1999 (to 48.4 million, 67.6% of them in rural areas), mostly concentrated in Java and Bali. In 1999, the poverty line was at 74,272 rupiahs in rural areas.

In 1997, the Ministry of Agriculture of the Republic of Indonesia prepared a project called Integrated Horticulture Development in Upland Areas, with the main objectives being: to increase farmers' income in rural areas and improve their welfare; to promote the development of agribusiness systems for horticulture commodities; and to contribute to rural development by creating growth areas. A small part of a trial project was carried out in three districts in West Java to develop a sizeable area of mango plantation. The area was selected on the basis of agronomic and agro-ecological characteristics. The results are reported here. Farmers were provided with certified planting materials and essential infrastructure, as well as intensive and integrated training programs focusing upon what needs to be done to produce high-quality fruits and to gain access to potential markets. The increase in farmers' income is expected through commercialization of their farming activities.

* Corresponding author.
Email address: <msmahendra01@yahoo.com>

Introduction

INDONESIA has a total land area of about 1.9 million square kilometers. Indonesia has only two seasons: dry and wet. The dry season is mainly influenced by Australian continental air masses, and the rainy season by the Asia-Continental and Pacific Ocean air masses passing over oceans. Since Indonesia consists of thousands of islands with many mountain and valleys, the variation in temperature is quite high and is influenced by altitude. Indonesia is well known as an agricultural country, as can be seen by the large area utilized for various types of farming. In 1999, the area used for agriculture in Indonesia comprised around 47 million hectares. Land used for agriculture can be categorized into arable dry land, garden, bare land, shifting land, brackish, freshwater pond, woods, estates and wetlands.

The total population of Indonesia in mid 2000 was 203.5 million, with the annual rate of growth of 1.35% over the 1990-2000 period. All provinces have a falling rate of growth except for Bali and East Nusa Tenggara (the latter due to the large number of East Timor refugees). The main development aim of the central government in Indonesia, which is to achieve the welfare of the population, will not be gained if the government cannot solve the population problem.

The problems and challenges faced by the agricultural sector in Indonesia include: maintaining balanced self-sufficiency in rice and gaining self-sufficiency in other foods; increasing land and labor productivity; increasing and diversifying the production of export commodities to meet the changing demands of international markets; increasing the value added to agricultural products (through better postharvest handling, distribution, processing and marketing); increasing agricultural investment toward promoting competitive agribusiness and agro-industry; increasing farmers' income especially those of smallholders; improving the nutritional value of food for the people; providing more employment in the agricultural sector; and conserving agricultural resources (Soedjana 2002).

Horticulture development in Indonesia

SEVERAL key issues in horticulture development in Indonesia have been identified. Very little attention has been paid to these in the production subsector. There is significant evidence in the field that cultivar selection for each potential commodity has not been properly considered before planting, and that neither have consumer preferences. In addition, these need to be coupled with an assessment of agro-climatic and soil conditions.

The purity of cultivars in producing large quantities of planting material has not been well managed. The plants are generally not well maintained, with the result that optimal yields of good quality products are not obtained at harvest.

Proper postharvest handling practices are not used, this being reflected in early picking, poor picking techniques, improper sorting and grading, rough handling with no postharvest treatments, poor packaging and lack of storage facilities for the crop. All these affect the end-quality of the products.

Substantial development of group-farming activities is urgently required to augment growers' bargaining power over downstream distributors, marketers and processors, aiming to transfer more of the return from value adding of the product to the farmers. Therefore, knowledge on where and how to market the product needs to be gathered long before harvesting.

Fruit production in Indonesia currently depends to a large extent on very many growers each growing a few fruit trees of various cultivars in small areas or backyard gardens. The cultivation and postharvest handling techniques are generally traditional, and it is therefore almost impossible for such individual smallholders to establish a reliable market, not only because of the perishable nature of the product, but more seriously because of the small volume of their production. Their ideas to improve the production, postharvest handling, distribution and marketing systems need to be encouraged. Individual farmers must either join with other smallholders or rely on the financial support of commercial producers, traders or processors.

If horticulture development were implemented in Indonesia in an integrated and appropriate manner the potential socioeconomic benefits include: profitable crop diversification; poverty alleviation; establishment of a partnership between farmers and private sectors; the acceleration of agro-industrial development; and an ability to meet domestic and foreign market demand with much better quality fruits.

Outline of project to improve farmers' welfare

THE aims of the *Gedong Gincu* mango project developed in West Java are: to increase farmers' income and improve their welfare; to support development of a *Gedong Gincu* mango agribusiness system; and to support regional development through establishment of fruit business centers. The scope of the project includes: providing work facilities; improving and developing facilities and infrastructure; providing agricultural production facilities; development of high quality seedlings; training for government field officers and farmers; and providing consulting services.

Linkages between smallholders and private sectors is urgently needed, not only to secure continued participation by the smallholder sectors, but also to ensure that their production is collected on time, is handled in a proper way, is delivered on time and is efficiently managed in accordance with quality requirements at a mutually agreed price.

The goals of the project include: development of intercropping of food crops in fruit orchards; conducting land development works (such as land clearing, terracing and *sorjan* cropping systems); provision of irrigation facilities (such as wells, water pumps, and *embung*, the last-named being small-scale irrigation systems consisting of a reservoir, network and drainage channels); construction of farm road facilities (in the form of new construction, rehabilitation and improvement, and road-related facilities); construction of windbreaks and animal protection fences; development of postharvest facilities (such as fruit-collection points, packing houses, sorting and grading equipment, and processing facilities); provision of office facilities (including construction of office buildings and procurement of furniture, equipment, and vehicles); setting up training for project staff and farmers (including horticulture agribusiness management, fruit orchard management, seed quality control, postharvest handling, and marketing and quality assurance systems); undertaking of SID (survey, investigation and design, which include cadastral survey, topographical mapping, detailed investigation and survey) and construction supervision; procurements of research equipment for seedling production; and provision of technical consultation services.

The project locations, with a total target area of 2500 ha growing *Gedong Gincu* mango, are spread over the three districts of Majalengka, Cirebon and Indramayu in West Java province. These sites were selected from a number of candidates on the basis of specific criteria set up in the feasibility study of the 'Integrated Horticulture Development in Upland Areas Project'. The criteria applied were: each site must be suitable for horticulture in terms of natural conditions and comparative advantage over culture of other crops; each site must have demonstrable potential in terms of agribusiness development and growth area creation; beneficiary farmers of the project shall be identified among owners of relatively small areas land in the site and who express willingness to participate in the project without compensation. They can be recognized as the pioneers in each district, who can contribute to the extension of the horticulture development in the area. To maximize the impact of development strategies, project components are selected to cover all essential activities, comprising preparatory works, infrastructure improvement and development, procure-

ment of agricultural inputs and quality seed-development equipment, training and consulting services.

It is estimated that the average per capita income of smallholder agricultural households within this project will increase from 1.8 million rupiahs (average per capita income by household groups in Indonesia (BPS 2000)) to 3.75 million rupiahs in 2006.

Concluding remarks

POSTHARVEST facilities and equipment provided for fruit orchards in this project include: collection centers, packing houses, sorting and grading equipment, chemical fertilizer, pesticides, fungicides, and raw material for organic fertilizer. To ensure effective and efficient project implementation at the field level, each unit area is supported by one field inspector. The unit area, which covers 100 ha, consists of five sub-units, each of which is represented by one key farmer leading at least 20 participatory farmers. Under supervision of a field inspector coordinator, each field inspector is responsible for extension and guidance including: selection of participating farmers and candidate sites for orchard development; assisting the farmers and providing technical guidance within the framework of orchard development and maintenance; supervision of field activity; monitoring of field-activity performance; promoting the organization of fruit growers' groups; and preparing periodical reports on the field activity performance for submission to the sub-project manager through the field inspector coordinator.

The improved techniques of postharvest handling and implementation of a quality-assurance system are expected to be gained through: the selection and establishment of harvest indices to improve fruit end-quality; selection of improved methods of postharvest handling at field level during the harvesting and collecting period to reduce physical injury of fruit; selection of improved distribution methods to inhibit fruit deterioration and losses between production sites to markets; selection of appropriate disease-control measures to reduce losses during distribution and marketing; and, finally, defining quality grades and introducing a quality-assurance system into the current production and marketing systems.

The techniques most often applied in the operation of extension programs have been farmer courses, demonstrations, exhibitions, farm contests, field visits and awards. In addition to these conventional methods, to gain greater advantages, new techniques have recently been introduced, including: dialogue between contact farmers and government officials to discuss agricultural policy implementation and related fields and to develop face-to-face communication and help open channels between farmers and policy-makers; workshops in farmers' fields to exchange information and experience

among farmers and for transferring skills or knowledge to stimulate farmers' self-confidence and self-reliance in respect to application of advanced agricultural technology; field days (meetings between farmers, research workers and scientists to exchange information regarding research findings or farmers' own experiences); farm business meetings (meetings between farmers and agribusiness firms to exchange information regarding production, postharvest handling and marketing techniques that lead to business transactions); consultation forums between government officials and contact farmers to exchange views and discuss matters regarding the implementation of government programs and farmers' activities; and farmer field schools (a method which combines the principle of farmer–teacher, experimental learning, learning through observation and problem solving).

Through the implementation of these extension techniques, farmers who participate in this project have organized into fruit-grower groups. More than 8000 farmers have been linked in 127 fruit-farmer groups spread over 11 suburbs of 32 villages. It is confidently expected that the improved conditions will enable farmers to have stronger bargaining power in marketing their fruit at reasonable prices and in gaining added value from their market fruit due to better postharvest handling practices and their own implementation of a quality-assurance system on their orchards. The fruit-grower groups can then be expected to gradually take over management of all activities, starting from production (on-farm), through postharvest handling, to distribution and marketing (off-farm).

As the project nears its end, these goals have not yet been fully realized as expected, due to constraints including: imperfect infrastructure, insufficient irrigation in some places, and local sociocultural conditions.

Acknowledgements

THE authors thank Dr Takahiro Inoue (President of JIRCAS) and Dr Yutaka Mori (Secretary of the Organizing Committee) for their kind invitation and financial support permitting the presentation of this paper at the 9th JIRCAS Symposium. The authors also wish to thank Mr Yutaka Matsumoto of IHDUA (Team Leader of Integrated Horticulture Development in Upland Areas, Under Horticulture Agribusiness Development Project, Directorate General of Food Crops and Horticulture, Ministry of Agriculture, Republic of Indonesia) for his support, and Mr Awal Rochmad who designed the PowerPoint presentation.

Bibliography

- Alexander, G.I. and Peacock, B.C. 2000. Quality assurance systems for ASEAN fruits (fresh and minimally processed). In: Johnson, G.I., Le Van To, Nguyen Duy Duc and Webb, M.C. (Eds), Quality assurance in agricultural produce. Canberra, Australian Centre for International Agricultural Research, ACIAR Proceedings No. 100, 79–92.
- BPS 2000. Statistical year book of Indonesia. Jakarta, Indonesia, Biro Pusat Statistik.
- Directorate General of Food Crops and Horticulture 1997. Final inception report, Integrated Horticulture Development in Upland Areas, Under Horticulture Agribusiness Development Project, Directorate General of Food Crops and Horticulture, Ministry of Agriculture, Republic of Indonesia. Jakarta, Directorate General of Food Crops and Horticulture.
- Mahendra, M.S. and Tridjaja, N.O. 2000. Implementation of quality assurance for 'Arumanis' mango. In: Johnson, G.I., Le Van To, Nguyen Duy Duc and Webb, M.C. (Eds), Quality assurance in agricultural produce. Canberra, Australian Centre for International Agricultural Research, ACIAR Proceedings No. 100, 616–620.
- Mahendra, M.S. and Tridjaja, N.O. 2000. Postharvest handling and implementation of a quality assurance system for Arumanis mango. In: Quality assurance systems for ASEAN fruits, proceedings of a workshop, Singapore, 2–4 December 2000. Brisbane, Queensland, Australia, Palamere Pty Ltd, pp. 25–29.
- MOA 2000. Agricultural statistics. Ministry of Agriculture, Republic of Indonesia.
- Simons, D.H. 1989. Quality and its maintenance. In: Fresh produce manual: handling and storage practices for fresh produce. AUF Fruit and Vegetable Association Ltd, pp. 1–22.
- Soedjana, T.D. 2002. Agricultural extension strategy in the regional autonomy perspective. Paper presented at Indonesia-ACIAR Country Consultation, Jakarta, 26–27 August 2002.
- Story, A. 1989. Postharvest treatments. In: Fresh produce manual: handling and storage practices for fresh produce. AUF Fruit and Vegetable Association Ltd, pp. 63–74.
- Tridjaja, N.O., Mahendra, M.S. and Hayati, M. 2001. Model of citrus farm development and farmer cooperative in Barito Kuala, South Kalimantan. Paper presented at the 20th ASEAN/2nd APEC Seminar on Postharvest Technology, Chiang Mai, Thailand, 11–14 September 2001.
- Wills, R.B.H., Lee, T.H., Graham, D., McGlasson, W.B. and Hall, E.G. 1981. Postharvest: an introduction to the physiology and handling of fruits and vegetables. Sydney, Australia, University of New South Wales Press.
- Wong, W.C., Mansour-Nahra, P., Ogle, I. and Sorby-Adams, N. 2000. Quality assurance: the concept and its evolution. In: Johnson, G.I., Le Van To, Nguyen Duy Duc and Webb, M.C. (Eds), Quality assurance in agricultural produce. Canberra, Australian Centre for International Agricultural Research, ACIAR Proceedings No. 100, 41–48.