Selected Issues Related to Contract Farming of Organic Agriculture in the Greater Mekong Subregion

by Anthony M. Zola
MIDAS Agronomics Co., Ltd.
10 August 2004

Selected Issues Related to Contract Farming of Organic Agriculture in the Greater Mekong Subregion

by Anthony M. Zola
MIDAS Agronomics Co., Ltd.

Table of Contents

Selected Issues Related to Contract Farming of Organic Agriculture in the Greater Mekong Subregion

by Anthony M. Zola
MIDAS Agronomics Co., Ltd.
10 August 2004

Poverty and environmental implications of organic contract farming

1. Four pillars are proposed to address rural poverty in the context of rural and upland areas of the Greater Mekong Subregion (GMS) namely: (i) ensuring the productivity of existing resources for food security and food self-sufficiency; (ii) reducing vulnerability; (iii) increasing the value of outputs produced and the value and volume of assets; and, (iv) increasing the share of value-added received by the rural poor. Specific agricultural aspects of poverty are being addressed that conform to the principles of sustainable resource utilization and land-use planning.

2. The policies of governments in the subregion support farmer livelihood strategies with the objective of: (i) achieving household food security; and, (ii) channelling remaining land, capital, and labor resources into diversified cash crop farming systems and family-, village-, and community-based (i.e., small) agricultural enterprises. In most cases the strategy to implement this policy is to deliver productivity enhancing inputs and agricultural services, including research results, technology transfer and extension services, agricultural production credit, support for household-based post-harvest handling and value-added processing, and market and price information, all in response to local needs. The intensity, priority, and sequencing of these inputs are adjusted for lowland and upland production areas as appropriate, based on the application of participatory planning processes implemented in the local socioeconomic and agro-ecological context.

3. GMS Member Governments generally acknowledge that poverty eradication is not possible without raising the awareness of government officials and farmers of the need for supporting sustainable agricultural development. This can be achieved through education and training about modern agricultural technology, but also by understanding and applying indigenous farming techniques and indigenous knowledge, and promoting environmentally friendly agricultural livelihood alternatives. In addition, it is necessary to instil the concept of sustainable use of diminishing resources into the behavior of all stakeholders.

4. Recent research on the links between poverty and environment has shown a strong correspondence for several environmental factors (i.e., deforestation, erosion potential, indoor air pollution, contaminated water, outdoor air

pollution) for both low and high-income areas of the GMS.[1] The conclusion is that the poverty-environment nexus appears to be strongly defined for upland and highland areas of the GMS, with a high potential synergy between poverty alleviation and environmental policies.

5. In this context, it would seem logical that GMS governments should pursue rural and agricultural development policies that are environmentally friendly and based on the sustainable use of existing agricultural and ecological resources. In particular, lessons should be learned from the practices of indigenous peoples and ethnic minority groups and their production technologies, specifically in upland and highland areas, which have provided them with an ample supply of natural resources and sustainable livelihoods over the long-term.

6. The cultivation of organic food and agricultural products is an appropriate measure to maintain the environmental integrity of upland and highland areas, while providing livelihood options and alternative agricultural development opportunities to poor areas of the GMS. Contract farming is proposed here as a systematic approach to introducing the cultivation of organic horticulture crops for export. The use of Asian agribusiness firms with successful previous experiences in contract farming is seen as an appropriate mechanism for introducing the organized production of food and agricultural products for export to regional markets. This approach is expected to take hold as the demand for organic products expands among global consumers.

Growing demand in the world market for organic products

7. World markets for organic foods are expanding, with annual growth rates of 15-30 percent in Europe, the United States, and Japan, for more than five years. As many as 20 to 30 percent of the consumers surveyed in Europe, North America, and Japan, claim to purchase organic foods regularly.[2]

8. The European market for organic vegetables continued to show high growth in 2001 and 2002, pushing market revenues above the US $1 billion mark in 2003. The organic potatoes product segment is the largest in the European market, accounting for half of market volumes in 2000. Increasing penetration of organic foods in major retail stores provides the impetus for continued high market growth. Although the profile of organic foods has risen sharply in recent years, there are still many European countries in which organic vegetables are restricted to specialist retailers. As organic vegetables continue to move into mainstream channels, the market will continue to report double-digit growth. Supermarkets have only recently become the most important marketing channel for organic foods in Europe.

[1] World Bank, The Poverty-Environment Nexus in Cambodia, Lao PDR, and Viet Nam, October 2002.
[2] U.S. Department of Agriculture, Food Review, Vol. 24, Issue 3, "Consumer Preferences and Concerns Shape Global Food Trade," September-December 2001.

- The retail value of the UK organic market is likely to exceed US$ 1.6 billion. This follows high growth rates in the category through the late 1990s. In 2002, the market value was estimated at US$ 1.47 billion. Imports accounted for an estimated 65 percent of the organic retail value, signifying a decrease in import reliance.
- The UK market has experienced the highest market growth in Europe since 1997, however the largest market in Europe remains Germany. The BSE ('mad cow disease') crisis and strong support from government are to maintain the German market's leadership position over the medium-term. France is to show the highest growth in the coming years. The French organic vegetables market is one of the least developed in Europe.
- In terms of consumption per capita, the Scandinavians lead Europe. Denmark and Sweden have the highest consumption rates of organic vegetables in Europe, with both countries projected to have their organic vegetables markets reach 10 percent of their vegetables markets in the medium term.

9. In the United States, the total organic sector of agriculture has recorded over 44 percent growth in certified acreage from 1992 to 1997, and cropland grew by 111 percent. Additional reports since 1997 indicate a continuing pattern of growth in organic acreage.[3] The total value of imported organic fresh produce into the United States is not known. However, the United States imports over US$6 billion of various fruits and vegetables. If the organic segment achieves the same level of imports as current United States retail sales volume (2 percent), the short-term import potential exceeds US$125 million.[4]

10. In recent years, the switch to organic foods has been accelerated by food scandals such as those which arose over bovine spongiform encephalopathy or BSE, porcine pest, dioxin contamination and controversies posed by the use of genetically modified organisms or GMOs. All these have motivated people's search for healthy foods.

11. As the world's biggest food importer, Japan provides significant opportunities for aspiring food exporting countries and enterprises in the GMS to expand and diversify their markets. Japan currently imports a large volume of selected food products from the United States, China, and New Zealand. In targeting the Japanese market as a potential source of demand for horticultural crops from the GMS, several global trade facts should be considered, namely:

- Three of the top six importers of US fresh fruits and vegetables are in Asia: Japan, Taiwan, and Hong Kong.[5]

[3] FAO and USDA, 2000
[4] Ibid.
[5] U.S. Department of Agriculture, Food Review, Vol. 24, Issue 3, "Processed Food Trade Deficit Continues in 2000," September-December 2001.

- The top five US processed food exports to Japan are meatpacking products, fresh and frozen fish, frozen fruits and vegetables, pet food, and canned fruit and vegetables.[6]
- Trade in fresh horticultural products has a 12 percent share of world agricultural trade, and has remained almost unchanged during the past 20 years.[7]
- Consumer concerns about food safety, the environment, and animal welfare will increasingly affect demand in many developed countries.[8]
- Japan is a strong market for organic food products, with major trading companies increasing their imports of organic frozen vegetables. Several US based organic certifying agencies have opened offices in Japan to certify producers of organic foods.[9]
- Food safety concerns about meat products, particularly beef and poultry, have resulted in an increase in the consumption of vegetables in Japan.[10]
- Japan's vegetable imports account for 11 percent of its total agricultural products and 15 percent of its vegetable consumption. China exports over 50 varieties of vegetables to Japan, making up 40 percent of Japan's imports.[11]

Experience of Chinese farmers growing organic products for supermarket in Japan

12. Foreign direct investment (FDI) in China by Japanese firms has led to significant increase in the import of food products from China, particularly vegetables. Japanese supermarkets have been experimenting with vegetable production in China for 8 to 10 years, but it is only in the past few years that Chinese quality has been good enough to allow large-scale sales to Japan. China's vegetables are much lower priced than the prices of those vegetables exported to Japan from elsewhere (namely the USA, New Zealand, and Australia). Increased imports by Japan in recent years have given China a significant share (upwards of 40 percent) of Japan's vegetable market, putting pressure on Japanese farm produce prices. For example, Chinese producers are now using Japanese seeds and other Japanese technology to improve their skills in vegetable production. Consequently, Chinese vegetables are now reportedly almost indistinguishable from Japanese vegetables.

[6] Ibid.
[7] Ibid.
[8] Ibid.
[9] Market Ag.com website, 1997.
[10] U.S. Department of Agriculture, World Horticultural Trade & US Export Opportunities, April 2001.
[11] China People's Daily, February 2001.

China Organic Vegetables in Japan Market

(2001-11-19) Luosen Company, a subsidiary of Japan's noted chain stores Darong (transliteration) Company, has made a decision to offer Chinese vegetables on all of its counters, hammering at safety and healthy vegetables supplier image to attract more customers.

The contributing factors for this decision are the lower costs of production and processing of China organic vegetables with only 1/5 of the price of Japanese counterparts (while the ordinary goods having only 1/10 of the price of Japanese counterparts), enabling rich profits without prices lifting.

Luosen Company, long being one importer of nine China vegetables such as spinach, taro and cauliflower, has established two frozen processing factories and three farms totally covering around 130 hectares in Shandong and Jiangsu Provinces in China, the sloe one in its domestic counterparts with self production, as part of its marketing program to realize the organic importation. Besides the company has obtained JAS organic certificate qualification.

Despite of these, Luosen has planned to convert its fresh importation into organic ones from China in the future, the first choice varieties being those with easily transportation and less damages such as onions and burdocks. The importation channels will doubtless include the self-plantation as well as the direct bought from the local farmers. (Information Center of Xin Hua Agency)

Update Date: Nov 19 2001 4:48PM

13. Japanese firms have invested in locations in both northern and southern China, which makes possible the production of vegetables throughout the year.[12] In addition, the Chinese port of Qingdao is a short 16 hours from the closest Japanese port,[13] greatly facilitating shipment. The landed price for most vegetables is about half of the Japanese price. Recent data collection at Tokyo supermarkets indicates that some Chinese vegetables are selling for only one-half the price of local vegetables.

14. However, there is official opposition to additional increases in imports of vegetables from China for two reasons: (i) the trade balance between Japan and China is strongly in China's favor; and, (ii) food safety issues, (i.e., high levels of pesticide residues have been found in vegetables imported from China[14]).

[12] Los Angeles Times, Iritani, Evelyn, "China's WTO Challenge: U.S. Farmers' Fears Growing," 8 August 2001.
[13] China People's Daily, February 2001.
[14] Nikkei, "Japan's Perishable Food Imports Drop on Loss of Price Advantage," 20 May 2002.

Japan to Legislate Ban on Vegetables from China

The Japanese government may place a ban on vegetables from China for excess residual pesticide, according to the new Food Sanitation Law enacted by Japan's Ministry of Health, Labor and Welfare. Experts say that the new law will exert far more influence on Chinese vegetable exports than last year's emergent ban on Chinese food.

Besides that, the Korean Agriculture Association also on June 28 submitted a formal petition to the Korean Trade Commission, demanding to prolong its ban on Chinese garlic to the end of 2006, which should be due by the end of this year. Japan's Ministry of Health, Labor and Welfare decided to revise the food law ahead of schedule.

After the law is revised, the Japanese government can adopt import ban on Chinese vegetables under the premise that if the Japanese side regards Chinese exports' security does not reach standard. What's more, the deeds will be deemed legally, Chinese exporters have to endure in silence.

On July 10, the ministry issued guidelines to related departments asking for measures against Chinese frozen spinach, it is actually cutting off Chinese vegetable exports to Japan. Japanese Asahi Shimbun said that most spinach exports to Japan were of the frozen type. Prior to this, Japan never made examination on Chinese frozen spinach, but in line with some unexpected charges the Japanese government began to check on the frozen spinach since March 20.

Some 42 batches of spinach were found overdose pesticide among 944 batches of spinach, and 41 were from China. According to another report, about 20 kinds of fresh vegetables and 18 types of frozen vegetables imported from China are found overdose in pesticide on June 27. Reports say that most of the insecticides found are phosphorous. Generally, food standard is not allowed to exceed 0.01 ppm, p contents in examined vegetables reached 0.1ppm, some even tops 2.5 ppm. The frozen spinach sold on market currently was imported last winter, the residual pesticide problem is hard to be solved in a short time.

Influenced by the overdose pesticide, frozen spinach imports from China have been cut a lot, it is predicted that Japan may stop import of spinach from China at a later time. Residual pesticide issue has aroused high concern among Japanese opposition parties and common people.

Apart from the Japanese government taking measures against the imports, Japanese media also violently reported the case, people in Japan seem to have been more and more being kept away from Chinese vegetables. In supermarkets, reporters see that Chinese mushroom, green Chinese onions are no longer on shelf, local vegetables are labelled as "pesticide free".

By PD Online Staff Li Yan 19 July 2002

15. As media coverage (above) demonstrates, Chinese vegetables being exported to Japan are being examined more carefully and increasingly are found to be contaminated with pesticides. As a result, it is likely that importers are returning to their previous sources of organic products (i.e., the United States, New Zealand, Australia) and are looking for new sites on which to establish sources of pesticide free commodities to meet the needs of Japanese consumers.

Comparative advantages of the GMS for this development strategy

16. The increased demand for organic foods in Japan, due primarily to food safety concerns with vegetables sourced in China, combined with significant expansion of global markets for organic food and agricultural products, offer new opportunities for GMS producers. Building on the model of the Japanese supermarkets investing in China, organic fruits and vegetables could similarly

be produced for the Japanese market in "uncontaminated"[15] areas of the GMS.

17. The potential exists to produce vegetables in the pesticide free areas of Cambodia, Lao PDR, Myanmar, and the Viet Nam, in response to demand in the Japanese market. Specifically, areas of northeastern Cambodia; the hills of northern Lao PDR and the Bolovens Plateau of southern Lao PDR; large areas of Shan State, Myanmar; and the central highlands of Viet Nam have the potential to be used to cultivate organic produce for export. Vegetables from these areas of the GMS could replace vegetable imports to Japan from New Zealand during the northern winter. Such produce likely would include spinach, broccoli, and vegetables that require heading (e.g., cabbage, cauliflower, etc.) that have been successful in areas of Thailand and Viet Nam.

18. Several other factors contribute to the comparative advantage of the GMS for initiating such a program, including:

? Existing arrangements for regional cooperation, including the ADB's Greater Mekong Subregion Economic Cooperation; and initiatives of the Japanese Government, namely the Working Group on Industrial Cooperation for Cambodia, Laos, and Myanmar, and the Basic Framework for Development Cooperation in the Mekong River Basin; all provide a framework for business development and investment.

? Familiarity with the subregion: The model used in China could serve as a basis for Japanese direct investment to initiate cultivation and to upgrade existing or establish new food processing facilities. This could be achieved through technical assistance agreements, both public and private. Japanese expertise, already familiar with agricultural conditions in the GMS could be mobilized to upgrade the capacity of GMS producers and processors to ensure that food and agricultural products were responsive to the preferences of Japanese and other East Asian consumers.

? Funding facilities: The GMS Business Forum is can identify interested firms and facilitate joint ventures with SME's interested in joining with Japanese firms. The Mekong Project Development Facility (MPDF) could facilitate financing arrangements in support of horticulture crop development in the subregion.

? Infrastructure development: Major investments in regional infrastructure have been made that support trade and cross-border investments among GMS Member Countries in agriculture and other sectors. Infrastructure achievements include:

[15] Categories include: (i) Organic: no chemicals have been used for more than three years; (ii) Organic in transition: no chemicals have been used for a period between six months and three years; (iii) No pesticides: no chemical pesticides have been used; (iv) Reduced pesticides: the use of chemical pesticides is reduced more than 50 percent of the average pesticide application; (v) No chemical fertilizer grown: products grown without chemical fertilizer; and, (vi) Reduced fertilizer grown: products where the use of chemical fertilizers is reduced to less than 50 percent of the average fertilizer use.

- Kunming - Chiang Khong road in the GMS North-South Economic Corridor (route 3 in Lao PDR);
- Special trade zones at the China-Lao border at Boten, Luang Namtha Province, and the Lao-Thai border at Ngeun District, Xayaboury Province, Lao PDR;
- Upgrading port facilities in the East-West Economic Corridor in Viet Nam;
- Danang – Mukdahan road in the GMS East-West Economic Corridor (route 9 in Lao PDR);
- Upgrading route 2 in Lao PDR, linking Nan Province, Thailand, with Dien Bien Phu, Viet Nam, via Oudomxay Province, Lao PDR;
- Bridges crossing the Mekong River being constructed at Savannakhet / Mukdahan and planned at Pakbeng, Oudomxay Province, Lao PDR and between Houey Xay, Bokeo Province, Lao PDR and Chiang Khong, Chiangrai Province, Thailand;
- A bridge across the Huang River between Kaen Thao District, Xayaboury Province, Lao PDR, and Tha Ly District, Loei Province, Thailand;
- A bridge across the Moei River between Mae Sot District, Tak Province, Thailand, and Myawaddy, Myanmar;
- Expansion of airports in several key towns and cities in Lao PDR; and,
- Upgrading of Mekong River port facilities in Lao PDR, Myanmar, and Thailand.

- Successful cross-border agricultural production supply chains: There are several examples of successful cross-border agricultural production supply chains in the subregion, including:
  - Potatoes being produced in Champassack Province, Lao PDR for processing in Lampang, Thailand;
  - Rice produced in northern Cambodia for processing in Sakaeo Province, Thailand;
  - Maize and cassava produced in Houa Phanh Province, Lao PDR for processing in Viet Nam;
  - Tea produced in Oudomxay and Phong Saly provinces, Lao PDR for processing in Yunnan, China;
  - Fruits and vegetables produced in Kayah State, Myanmar, for processing in Tak, Sukhothai, and Phitsanulok provinces, lower northern Thailand;
  - Maize, soybeans, and macadamia nut trees produced in Shan State, Myanmar for processing and sale in Chiangrai and Chiangmai provinces, Thailand;
  - Maize being produced in Oudomxay and Xayaboury, Lao PDR for processing in Thailand; and,
  - Potatoes and castor beans being produced in Shan State, Myanmar for processing in Lampang province, and Bangkok, Thailand.

Potential and constraints in development of agro-processing of organic products

19. Although contract farming with smallholder producers is not widely practiced in the GMS, it has been somewhat successful with selected crops, livestock, and aquaculture in a few locations in Thailand and Viet Nam. There even are some successes in Cambodia and Lao PDR. In all cases however, several years were required for producers and processors to learn how to operate with each other.

Constraints

20. Owners and managers of agro-processing facilities point out that perhaps the most critical factor is that both producers and processors have the same mind-set – the same understanding, attitude, and belief – about contract farming: the purpose and objectives of the arrangement. Agro-processors in many locations have pointed out that even though they have processing facilities, markets, and financing, projects can fail if farmers cultivate commercial crops under contract by applying the same standards and techniques that they utilize in operating subsistence farms.

21. For farmers to be responsive to the needs of agroindustrial facilities, key factors that require changing include:

?	Farmers' attitudes:	:	Producing for subsistence vs. producing for processing
?	Skill levels	:	Improved crop and animal husbandry and post-harvest handling at the field level; family-based primary processing
?	Quality of planting materials	:	Use of higher quality and hybrid seed and plant material
?	Agricultural chemical use	:	Minimize the use of chemical fertilizers and pesticides and increase use of integrated pest management and organic fertilizers

22. A selection of other constraints to establishing or expanding contract farming include the following factors:

? Poor terms and conditions for investment, including ambiguities in foreign investment regulations and limitation of investment options based on subjective constraints;

? Limited access to credit and financial resources, including weak financial systems; banking services and financing structures at crossborder trade locations are limited or non-existent; export financing facilities do not exist;

? Limited access to markets, including the poor state of road transportation, especially in the wet season and particularly secondary and tertiary rural access roads, limited knowledge and poor

understanding of domestic and regional markets for food and agricultural products as a result of the lack of market, price, and marketing information needed for decision making; impediments to intra-regional, inter-provincial, and rural/urban trade in agricultural products; limited number of international cross-border points, limiting formal trade; and, trade regime uncertainties (implementation by local officials of WTO, AFTA, and ASEAN/China free trade agreements);

- Storage facilities for agricultural products in rural areas and particularly at cross border locations are limited, inadequate, or non-existent;
- Telecommunications facilities are limited in many areas of the GMS; and,
- Low productivity as a result of low level of education, training, and knowledge of modern agricultural production skills and limited access to information for decision-making.

Potential

23. Use of indigenous knowledge: Emphasis initially could be placed on expanding production of several commodities that are already being produced in the subregion. Markets in GMS Member Countries could be targeted first followed by exports to East Asian regional markets. This initiative should aim to build on the comparative advantage of indigenous knowledge of the numerous ethnic minority groups living in the region. The cultivation of organic products using a contract farming approach could be introduced once the concepts of quality control are introduced. Selected opportunities for livestock, grain and horticultural crops, and domesticated non-timber forest products (NTFPs) are presented in Table 1.

Table 1: Opportunities for Contract Farming of Food and Agricultural Products for Potential Markets

Commodity Group	Commodities	Potential Markets	
		GMS	Regional
Livestock	free range, free roaming, or pasture raised poultry and cattle; potentially also sheep, goats, swine, ducks	Thailand, China	Malaysia, Singapore
Grain & Field Crops	maize, soybean, Job's tears, castor beans, white sesame, sugar cane	China, Thailand, Viet Nam	Japan, Korea
Horticulture crops	tea, organic vegetables	China, Thailand	Japan, Korea
NTFPs	cardamom, tree bark (used for incense), lac, resins, organic honey, grasses (for brooms), bark used to make traditional (*po saa*) mulberry paper, hemp, agar (perfumed) wood (*Betula alnoides*, genus *Betulaceae*), essential oil plants, herbs, wild flowers, palm fruit,	China, Thailand, Viet Nam	Korea, Singapore, Europe
Tree crops	Tropical and sub-tropical fruit, rubber,	China, Thailand	Indonesia, Malaysia, Philippines

24. Production of natural medicines: To maximize the use of an impressive degree of human and biological diversity that prevails in the GMS, the indigenous knowledge of ethnic groups about medicinal herbs should be identified, documented, and disseminated. It has been pointed out by regional

anthropologists that agroforestry linked to the domesticated cultivation of traditional medicines has perhaps the greatest potential advantage for ethnic minorities because of the combined ethnic and biophysical diversity in the subregion. Public health officials in the region recommend that upland farmers be encouraged to cultivate the herbs listed on Table 2. Organic production could be carried out as part of a GMS agroforestry program to domesticate NTFPs in appropriate locations.

Table 2: Selected List of Medicinal Herbs for Promotion

Common English Name	Scientific Name
Jewel Orchid	Anoectochilus roxburghii
Black ginger	Keampfera pandorata
Camphor tree, camphor laurel, shiu leaf, gum camphor	Cinnamomum camphora
Carey herb[16]	Careya herbacea
Window-wood	Coscinium fenestratum

25. Livestock production: Contract farming arrangements with livestock traders and meat processing facilities in neighboring countries can motivate individual farmers and farmer groups to upgrade the quality of livestock products by having farmers adopt:

- Improved breeds;
- Advanced animal husbandry techniques; and,
- Animal disease prevention measures.

Steps to be taken to materialize this strategy

26. The intensity, priority, and sequencing of contract farming should be adjusted for lowland and upland production areas as appropriate. Any program for the GMS should be designed in response to market data and information obtained through a market research program implemented by the GMS Business Forum or another business oriented organization. Similarly, the GMS Business Forum is an appropriate lead agency for working with the regional business sector to identify the most suitable counterpart agencies in each GMS Member Country to facilitate the organization of contract farming producer groups at the local level.

27. Initially, national agricultural extension organizations, if necessary working with technical assistance supported by development partners, and agribusiness enterprises would take the lead in operating contract farming pilot projects at selected locations in the region. The pilot projects would aim to introduce (i) quality standards for food and agricultural products; (ii) an understanding among farmers of the contract farming approach; and, (iii) quality control mechanisms, which could be operated by public or private organizations.

[16] Perennial herb, with a woody rootstock

28. The role of government would be to facilitate and coordinate. To ensure that farmers are not treated unfairly, government (particularly local governments) should monitor and evaluate pilot projects, learning lessons for replication of contract farming arrangements, and to ensure that business interests do not exploit farmers. Based upon the results of the pilot projects, contract farming arrangements can be modified as necessary and successful models expanded to other priority areas for development in the GMS.
29. Simultaneously, the GMS Business Forum (GMS-BF) and national chambers of commerce and industry could extend invitations to counterpart chambers of commerce in Japan, specifically to representatives of Japanese supermarkets, and other East Asian businesses, to assess the region's potential for organic production of horticultural crops for export. The visits could be organized in collaboration with concerned ministries of GMS member countries, for the purpose of identifying sites for introducing and promoting organic agriculture.

30. The production of organic fruits and vegetables could be promoted in pesticide free areas of the GMS in response to demand in the Japanese market. A specific initial target would be to produce vegetables in the subregion to replace Japanese vegetable imports from New Zealand during the northern winter months.

31. Based on the model used by Japanese investors in China, Japanese firms would initiate vegetable (and perhaps later fruit) production on nucleus plantations (large-scale vegetable farms of up to 100 ha), established on land made available through "organic agricultural development" concessions in the subregion. Technical assistance and training would be provided initially to interested villagers nearby, as well as to provincial and district agriculture technicians, and later to other villagers interested in growing organic crops. In addition to crops produced on nucleus plantations, an outreach program could be initiated at the plantations, using district agriculture technicians and farmer leaders to train villagers to produce crops under contract to the local plantation.

32. The nucleus plantations initially would focus on vegetable production. It is anticipated that both post-harvest handling and commodity packing processes would be introduced early on, to ensure that the commodities arrive at Japanese markets in the best possible condition. The introduction of basic processing of commodities at the farm and community levels also would provide opportunities for adding value and ensure that producers obtain better prices. In addition, existing umbrella technical assistance agreements between Japan and individual GMS Member Countries could be used to mobilize Japanese technical assistance to train agricultural technicians and farmer leaders to grow organic vegetables at other appropriate locations in the subregion.

33. It is anticipated that in the medium-term (say 3-5 years) food processing facilities would be established to provide additional value-added to the commodities being produced. Through public and private technical assistance agreements, Japanese expertise could be mobilized to upgrade the capacity of producers and processors to ensure that food and agricultural products were responsive to the preferences of Japanese consumers.

34. Certification program for organic agriculture: Using appropriate national institutions, a program could be initiated to register and certify upland farmers who agree to practice natural or organic agriculture. Similar to programs for the adoption of good agricultural practices (GAP) and domestication of NTFPs, technical assistance, training, and credit could be provided by agroprocessing facilities to those producers who wish to have their products certified organic.

Issues which need attention from researchers

35. Issues recommended for further attention from researchers could include the following items:

- Research on applying indigenous farming techniques and indigenous knowledge to the production of high value food and agricultural products, and the environmentally friendly agricultural livelihood practices of the ethnic minority groups of the GMS.
- Documentation of the environmental impacts of organic production of fruits and vegetables in remote upland areas of the GMS.
- Documentation of successful previous experiences in contract farming in the GMS to determine appropriate mechanisms for introducing the organized production of organic food and agricultural products for export to regional markets.
- A series of case studies on the experiences of Chinese farmers engaged to produce organic fruits and vegetables for Japanese supermarket chains in both northern and southern China.
- A regional study should be undertaken to identify “uncontaminated” areas of the GMS and their suitability for the production of organic food and agricultural products, as well as the interest and awareness of producers to the value of organic produce. An appropriate definition of suitability would be required and should take into consideration important factors related to market access, infrastructure, and commitment of local governments to participate as development partners with agroprocessors.
- An examination of trade routes, including road, rail, air, and ship transport throughout the GMS, that would be used to facilitate the movement of organic produce out of mainland Southeast Asia to Japan and other areas of East Asia.