Farmers’ Organizations and Sustainable Food Security, Livelihood, and Environment

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September 7, 2022
I. Introduction

Three main “sustainability” issues facing Asian agriculture (Otsuka and Fan 2021):

1. Increasing inefficiency of small-scale farming in Asia, which jeopardizes sustainable food security;
2. Enhanced need for shift from low-value to high-value crop farming, which contributes to sustainable livelihood of farm households;
3. Need for the adoption of environment-friendly farming practices and management of natural resources for environmental sustainability.

* Since farmers’ organizations can contribute to the solution of these problems, it is timely and useful to organize virtual meeting on “Farmers’ Organizations and Sustainable Development.”

** The purpose of my presentation is to provide broad context in which presenters in this meeting will discuss various aspects of Asian agriculture.
2. Increasing inefficiency of small-scale farms

- Inverse Relationship between Farm Size and Yield (or Productivity) in Low-Income Countries:
  Low income and low wage $\rightarrow$ Advantage of labor-intensive farming $\rightarrow$ high family labor input on small farms and high costly hired labor input on large farms $\rightarrow$ higher yield per hectare on smaller farms $\rightarrow$ inverse relationship between farms size and yield (or productivity)

- Positive Relationship between Farm Size and Yield in High-Income Countries:
  High income and high wage $\rightarrow$ Advantage of capital-intensive mechanized farming $\rightarrow$ lowered demand for family labor and reduced supervision cost of hired labor $\rightarrow$ Loss of advantage of small farms and loss of disadvantage of large farms $\rightarrow$ higher yield and productivity on larger farms $\rightarrow$ positive relationship.

* Note that if land rental market works, cultivation rights are transferred from inefficient farms to efficient farms, so that neither inverse nor positive relationship between farm size and productivity should emerge.
Growing Advantage of Large Farms in Asia (Otsuka et al. 2016b)

• Inverse relationship was often observed in South Asia, particularly in India, where land rental markets were suppressed by land reform laws, but not in Southeast Asia where land reform was not generally implemented.

• Inverse relationship was lessened or U-shaped relationship has emerged in high-performing Asian countries where traditional labor-intensive small farms and capital intensive large farms coexist, e.g., Pakistan, India, and China.

• Clear positive relationship is observed in high income countries, e.g., Japan.

* The question is whether farm size has been increasing in high-performing Asian countries, in order to take advantage of increasing optimum farm size.
Figure 1. Changes in Average Farm Size in Selected Asian Countries, 1960-2020
Figure 2. Declining Grain Self-Sufficiency in Selected Asian Countries, 1961-2017
Future of Asian Agriculture

• Scenario 1: Preservation of small farms ➔ Increasing inefficiency of farming ➔ Increased dependence on food import and reduced food security, not locally but also globally because of massive food import of Asia.

• Scenario 2: Enlargement of farm size ➔ Increasing mechanization ➔ Prevention or mitigation of loss of comparative advantage in agriculture ➔ Maintaining food security.

* In order to achieve “scenario 2,” (1) both land sale and rental markets must be activated by establishing clear individual land rights, (2) small pieces of land must be consolidated possibly with the support of the government, and (3) mechanization must be promoted by the provision of credit by the government.

** Producers’ organizations should support the promotion of large-scale mechanized farming by promoting land transactions, consolidations, and the adoption of land-saving technologies, particularly mechanization and IT-based technologies.

*** Promotion of new labor-saving technology and large-scale farming ought to be new role of farmers’ organizations in Asia.
3. Shift from low-value to high-value crop farming (Otsuka et al. 2016a, 2020b)

- Increasing demand for high-value agricultural products (e.g., fresh fruit and vegetables, dairy products, and flowers; or HVAPs) and decreasing demand for staple foods ➔ Need to shift from traditional grain production to production of HVAPs.

- There are many obstacles to shift: (1) unavailability of new and improved inputs (e.g., new seeds or seedlings, improved calf & chicks, safe pesticides and other chemical inputs), (2) lack of farmers’ knowledge about new production methods, (3) inefficient credit markets, and (4) quality uncertainty of HVAPs and need to acquire certification of standards.

- In order to overcome market failures mentioned above, contract farming widely emerges, in which contractor (e.g., supermarkets and exporters) provides inputs on credit and information on production methods, purchases products at predetermined prices, and ensures quality and safety.
Pitfalls of Contract Farming and Role of Farmers’ Organizations

1. Diversion of provided inputs for other purposes or sell them to other farmers.

2. Side-sale to other merchants, particularly when market prices are higher than predetermined contracted prices.

* In other words, contract farming is costly for contractors, as they have to closely supervise contracted farmers.

** Thus, contractor prefers to make a small number of contracts with large farmers than a large number of contracts with smallholders. As a result, large farmers are favored.

*** In order to reduce transaction costs for contractors associated with contract farming, smallholders may voluntarily form farmers’ organizations, which make contracts with supermarkets and exporters.

**** There are many such cases, including organic jasmine rice in Thailand and pepper in Cambodia.
Agrifood processing sector holds another key to the success

- HVAPs must be “processed” before shipping to urban markets and foreign markets. Importantly, processing includes “pack house,” which washes, dries, fumigates, grades, and packs HVAPs.
- Thus, processing firms play a key role in marketing HVAPs.
- Agrifood processing firms are often clustered, similar to industrial clusters in the manufacturing sectors.
- A large number of economists (e.g., Nick Bloom, John Van Reenen, Miriam Bruhn, Antoinette Schoar, David McKenzie, and Christopher Woodruff) found that the lack of managerial ability is a major constraint on firm growth in developing countries.
- Sonobe and Otsuka (2006, 2011, 2014) argue, based on roughly 20 case studies of industrial clusters in Asia and Africa, that innovation tends to be inactive in industrial clusters, because of the ease of imitation that creates gap between private and social benefits of innovation.
Plea for studies of agro-processing industries

• Conventionally, agricultural economists look at agriculture, whereas economists interested in industrialization do not pay attention to agriculture and the agro-processing industries.

• This “division of labor” is a serious mistake.

• In successfully developed industrial clusters, producer cooperatives or associations introduce new technologies from outside, disseminate them to member firms, and assure the quality of products to create and maintain the reputation of their clusters as producers of high-quality products.

• Development of the agro-processing industries is an important part of rural industrialization, which is badly needed because of concentrated epidemic of coronavirus in large and mega cities in Asia.
4. Adoption of environment-friendly farming practices and management of natural resources

There are many types of externalities associated with farm and related activities, which can be resolved by collective actions of farmers led by farmers’ organizations. A few examples are:

- Management of contagious diseases in aquaculture (e.g., shrimp farming)
- Management of common property (e.g., community forest, ground water, communal grazing land)
- Reduction in the emission of greenhouse gases (e.g., methane from paddy fields and cattle)
4-1 Management of diseases in aquaculture

• Since production is most efficient under individual management, it should be carried out by individual farmers, unless common property (e.g., communal lake and pond) is used.

• The roles of cooperatives are to provide training of appropriate production practices, to regulate production methods so as to reduce negative externality, and to recommend closure of aquaculture business once diseases are discovered.
4-2 Management of common property

• Common property (or common pool) resources are characterized by rivalry in consumption and difficulty in exclusion.

• Examples are community forest, ground water, communal grazing land, and communal lakes.

• Tragedy of commons: Social marginal product = product extracted by marginal community member – production loss of all community members due to congestion. Marginal community member will take into account only the benefit of the product extracted by him/her, without considering negative externality or production loss of all community members ➔ Over-exploitation of natural resources = Tragedy of commons.
Beyond Ostrom

• Ostrom argues that many rural communities have capacity to regulate the extraction of common-property resources so as to avoid the tragedy of commons.

• To the best of my knowledge, there is no community which regulates the use of ground water effectively. Thus, too much water is extracted and, hence, water table declines, leading to the tragedy. This tragedy is exacerbated by subsidy to fuel for pumping ground water. Since ground water is not “local common property” but “regional common property,” federation of farmers’ organizations must play a role in regulating the use of ground water.

• I have never seen community forests growing valuable timber trees. My understanding is that community is capable of protecting trees, as Ostrom argues, but it does not have capacity to promote investment in common property, e.g., tree planting and pruning.
4-3 Reduction in the emission of greenhouse gases

- This is the future issue because measurement methods of greenhouse gas emission from agriculture have not been developed.
- How to reduce emission of methane, however, is largely known.
- In future, penalty will have to be imposed on emission, whereas rewards will be given to reduction in emission.
- Managing and supervising emission of greenhouse gases will become a major task of farmers’ organizations in future.
- Anticipating such future roles, it makes sense to develop and strengthen capacity of farmers’ organizations even from now.
Selected References


Thank you very much for your attention.
I look forward to learning a lot from your presentations in coming three days.