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# The Role of Farmers' Organizations in Agricultural Technology Transfer in Malaysia

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## Introduction

This paper relates the experiences of Malaysian farmers' organization in contributing to the country's program for transforming the agriculture sector. The paper highlights the challenges faced by these organizations in the process of technology prospecting, adoption, and transfer.

## Farmers Organizations in Malaysia

The farmers' organizations (FOs) in Malaysia are modeled after the Taiwanese farmers' associations. FOs are corporate bodies registered under the *Farmers Organisation Act* of 1973. State-level FOs are secondary-level FOs, while the national FO is a tertiary-level FO. Legally, the objectives for the formation of FOs are the promotion of the economic and social interests and wellbeing of their members and member-units through the direct participation and by carrying out those activities that are required for the achievement of the objectives. Those activities include:

(a) Providing extension services and training facilities to equip farmers with the technology for the advancement of agriculture, horticulture, animal husbandry, home economics, agribusiness, and other commercial enterprises;

(b) Expanding agricultural production among farmers and small holders so as to promote greater diversification and commercialization of agriculture and to promote agribusiness;

(c) Providing farm supplies, farm mechanization services, and credit facilities, and promoting greater investment in agricultural and economic pursuits, facilities for rural savings, marketing storage warehousing and drying services, transportation facilities, and processing facilities for agricultural products;

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(d) Facilitating capital formation and promoting investment among farmers through equity participation in commercial and agribusiness ventures;

(e) Assisting members in acquiring land to undertake land development projects; and

(f) Promoting and stimulating group action through community projects and facilitating leadership development.

The FO movement in Malaysia has 650 members. In recent years, the movement has experienced trends of decreasing numbers of farmers, and increasing numbers of part-time farmers (who derive income from both agriculture and non-agricultural activities) and aging farmers. FOs are actively campaigning for youth and also professionals involved in agricultural production to join the organizations.

FOs in Malaysia are overseen by a statutory agency under the Ministry of Agriculture, which is the Farmers' Organization Authority (FOA).

In Malaysia, apart from the area farmers' organizations, the Department of Agriculture also directly organizes farmer groups.

## Agriculture in Malaysia's Economy

Malaysian agriculture began to receive greater attention again after the regional financial crisis of 1998, after being sidelined in the early 1980s and mid-1990s when the country embarked on rapid transformation of its manufacturing and service sectors. Agriculture achieved an annual growth rate of more than 4% during the 2 decades up to 1990, and at a rate of 2% in the 1990's, at which time, other sectors including manufacturing, finance, transport, communication, and government services all grew faster than the agricultural sector.

During the regional financial crises of 1997, the agricultural sector (particularly the export sector) became the savior of the country's balance of payments. Agricultural exports, particularly palm oil, enjoyed high prices during that crisis period. The financial crisis also highlighted the situation with the rapidly growing food import bill of the country, which was around RM 12 billion in 1998. The major components of food imports were mainly feedstuff, processed food, fruits, vegetables, meat, and dairy products. Despite the net continued increase in the absolute production of agricultural commodities and food products, the country continues to be a net importer of food. The food bill grew to the record-high figure of RM 13 billion in 2000.

## Research and Development in Malaysia

One of the implications of the reduced focus on agriculture in the 1980s to the mid-1990s was the limited development funds allocated to research and development. The majority of allocations for agriculture as expected were expended to fulfill the socieconomic objectives of plant and primary production. This can be attributed to the greater number of researchers based on fulltime equivalency who are involved in plant production research.

However, out of the total allocation given for R&D, only about 15-20% was allocated for primary production of plants and animals, a figure considered rather low. The relative amount expended by the private sector for agriculture (either through local or foreign investments also showed declining trends over the years 1992-1998. Most agricultural allocations have been expanded for current expenditures (Mastec, 2002).

Despite a vast array of technological innovations in agriculture both regionally and globally, indigeneous or home-grown inventions and technological improvements in fish, fruits, and vegetables were limited, with the exception of paddy rice (Fatimah, 2002). Recognizing that the key to technological advancement is R&D, funds for R&D were increased from 0.2% of GDP in 1995 to 0.4% in 2002. The allocation of an IRPA (Intensified Research Priority Area) fund for agro-based industry research was 25% of the total value of funds for research. But then the major issues and orientation of the research, i.e., whether it is finding solutions to production, processing, or marketing problems, or moving towards economic, social, and environmental well being of the society at large, have had different impacts.

## The Third National Agriciultural Policy

### (NAP3, 1998–2010)

In 1998, Malaysia launched the NAP3. Under the NAP3, agriculture was designated the third engine of growth for the country, after the manufacturing and service sectors. The food sector is being given special emphasis.

The NAP3 addresses future needs for agriculture and food production in Malaysia, including:

- A requirement to improve food security;
- The need to improve agricultural efficiency and productivity;
- A desire to reduce particular imports;
- The need to encourage additional private sector investment in food production; and
- The requirement for more-sustainable uses of nature resources.

The NAP3 recognizes that the forces driving future change in the agricultural and food industries will need to embrace:

- Changing consumer tastes and behavior;
- Globalization influences;
- Changing market structures;
- Advancing technologies;
- Changing regulatory requirements;
- Increasing competition and production efficiency pressures; and
- Environmental concerns.

## Food Production Plans

The national food production plan gives strategic emphasis to three food groups, namely the crop group comprising paddy rice, fruits, and vegetables; the livestock group comprising beef, poultry, and dairy; and the fish/aquaculture group.

The productive capacity of these sub-sectors is currently limited by a number of structural constraints, including:

- Uneconomical farm sizes;
- Continuing traditional and semi-commercial approaches to food production;
- Lack of effective integration between production and downstream components of the food chain;
- Acute shortages of labor; and
- Lack of private sector investment in commercial food production, resulting in slow technological and business advances.

## Transformation of Agriculture

In order to give impetus to implementation of the NAP3, Malaysia's Ministry of Agriculture (MOA) launched a Transformation Programme. This transformation process is to be implemented via two main strategies, namely through the modernization of existing producers and increases in private sector investment. Some enablers related to land, infrastructure, technology, financing, incentives, and market development have been established to support this transformation.

In order to provide for more-structured development, production zones for crops, livestock, and fisheries have been developed based on the best possible conditions for production and development. In relation to the lack of land, 70,000 ha has been identified as permanent areas for food production following the consent of various states governments. This is a step towards promoting private sector involvement in food production activities on a large scale.

Various other steps have been taken to increase private sector participation in food production including inviting participants to take part in smart-partnerships with government agencies under the MOA in the implementation and development of new and existing food production projects, establishing Business Development Centres as one-stop centers to facilitate easy retrieval of information and technical assistance, improving tax incentives schemes, increasing the number and quantity of loans under the Fund for Food Scheme, and intensifying entrepreneur development programs.

Development of a venture capital loan scheme and an Agricultural Insurance scheme.

The Private-Public Sector Coordination Council has been established in order to strengthen the cooperation mechanism between the government and private sector to ensure the success of agriculture development and a national production plan for food. This council is chaired by the Prime Minister himself with members comprised of state and federal government officials and members of the private sector.

Modernization and commercialization of the smallholding sector are implemented through development projects that are comprised of *in situ* group farming and which have a business approach. This step is taken to transform their agricultural activities into profitable business ventures, especially with the collective resources and efforts among members. The implementation of these projects is strengthened via the MOA's approach whereby all agencies and departments under the MOA channel advisory, management, and technical assistance in an integrated and planned manner.

Quality, safety, and product presentation are to be emphasized in the marketing of food products to ensure acceptance by consumers, both local and overseas. Other than the cost of production, factors that determine the competitiveness of national food production activities are also given emphasis. In this matter, the MOA has taken steps to develop an accreditation scheme and SPS programs for crop, livestock, and fish production to be practiced by producers. A national branding standard (Malaysia Best) has also been developed with a view to increasing the market values of products, especially those intended for export markets.

The emphasis of the transformation program for the food production subsector is on the ability to use the latest technologies and information. In this regard, activities of technology transfer, either from research findings of local R&D institutes and universities or imported technologies via technology acquisition activities, are being intensified. Priority areas of research for local R&D institutions such as MARDI, FRI, and VRI requiring budgetary resources have been identified. R&D institutions are also required to develop programs and facilities such as technology incubators in order to hasten the transfer, commercialization, and uptake process for the technologies they generate. As to development of the food production sector, the efficiency of dissemination and utilization of all forms of required information has been intensified via establishment of the National

Agricultural Information Centre (Knowledge Centre), various websites such as Agrolink, and agricultural portals such as FAMAX/Agric-X.

The utmost important element required to ensure the success of the development of the food and agricultural sectors, is having knowledgeable and skilled human resources. Apart from existing training institutes run by the Department of Agricultura, the MOA is in the final stages of establishing a National Agricultural Training Centre with a view to developing professional managers and entrepreneurs.

The focus of the transformation process is to transform the image of the agriculture sector towards a more-modern, dynamic, large-scale, commercial, and competitive entity. Both producers from the private and smallholding sectors have been made aware of the changing global scenario that requires them to be more efficient and competitive as has been the case with the manufacturing and service sectors.

## Transformation of Traditional Farmers

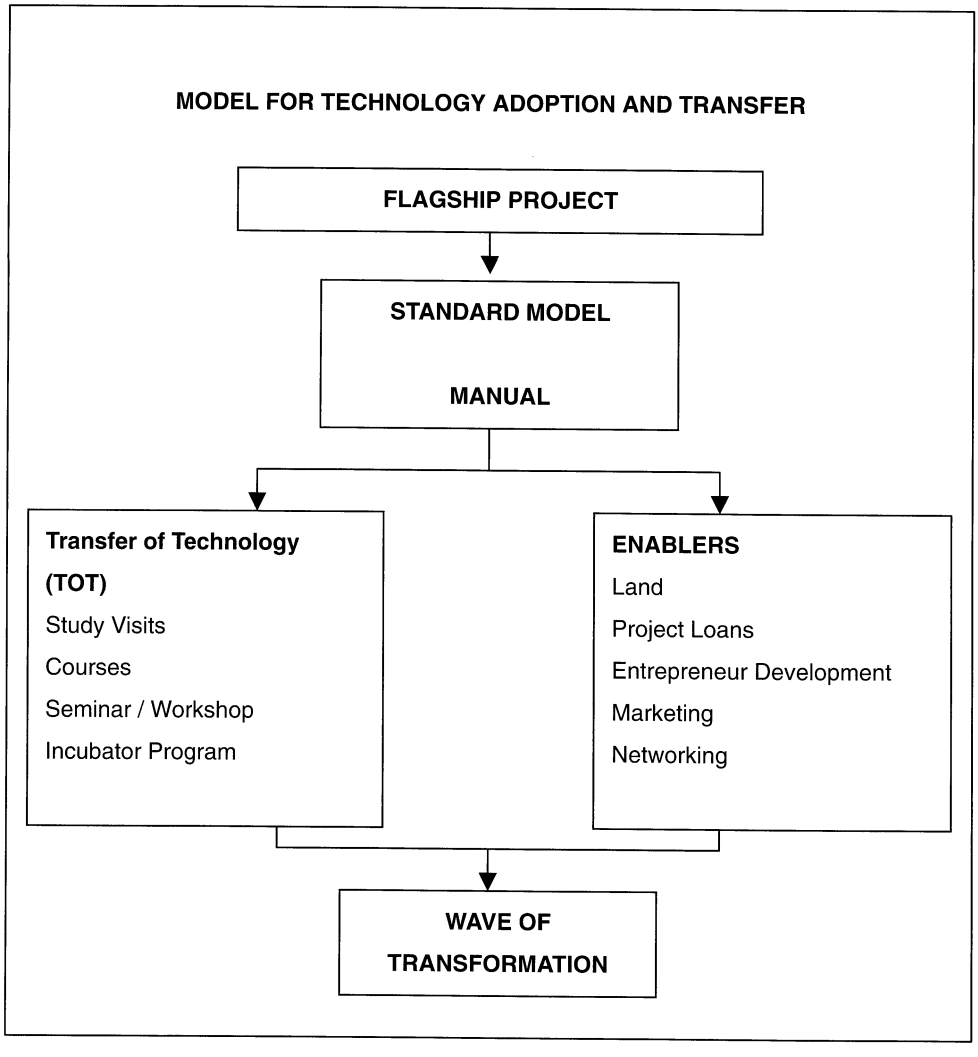
The biggest challenge in transformation is still a social issue: changing the mindset of traditional farmers. We approach this by attempting to visually and physically prove to the farmers the benefits of change close to where they are, by creating model farms in their vicinity. In this respect, the FOA was directed to engage 268 AFOs under its charge to mobilize their 650,000 members throughout the country, to bring to them the message of transformation.

In 2001, the FOA was directed to develop 48 model projects covering paddy rice (10), fruits (11), vegetables (8), aquaculture (9), and livestock (9), involving 41 AFOs. The projects are required to adopt the latest technology, and their best performance is expected to be used as a benchmark against the industry's best. Development of individual projects requires the involvement of departments and agencies under the MOA, especially the relevant department and agency responsible for the subsector under the MOA's team approach in the spirit of MOA-Inc.

The technology and practices, which are supposed to be the latest, for the respective projects are to be adopted from the relevant departments and agencies. In each of these model projects, the selected AFOs are to work by following a prescribed manual and schedule, and adopting GAP (good agricultural practice) systems. FOA/FOs are expected to replicate the successful model for target farmers.

## Transformation Approach

The model being adopted to implement Agriculture Transformation is illustrated in the following chart.



**Model Projects**

In late 2000, the FOA was directed to develop 48 model projects in the five subsectors of paddy rice, fruits, vegetables, livestock, and aquaculture. These are regarded as FOA flagship projects, to be given special priority and attention by the FOA. Other departments and agencies under the MOA were also required to accord special assistance in their respective areas involving the supply of certified quality seeds/planting materials, fry or breeder animals, and technology advisory support on production, diseases, pests, financing, and marketing.

The model projects are expected to incorporate the best of the industry practice in respect to technology application of such production projects. The technology adopted is expected to impact the maximization of productivity and cost-savings (benchmarked on the industry's best) as well as taking into consideration food safety and environmental aspects. Technological aspects are related to high-quality seeds, planting materials, fry and breeder stock, mechanization and automation, production methods and work processes, sanitary and phytosanitary practices, and harvesting and post-harvest handling.

As the FOA is charged with the project development, it in conjunction with FOs, prospects for technology from research institutions, departments, universities, suppliers, and the private sector involved in the subsectors. Visits are also made to similar enterprises in neighboring countries. A commercial-scale project model is usually not found in research institutions or government departments, but can be found in private sector operations.

FOA's flagship or model projects must also incorporate the following features:

- Industry's best practice technology;
- Commercial-scale and market-oriented practices;
- Certified GAP (good agricultural practice);
- Bio-security;
- Good management;
- An operation manual and checklist;
- A business plan; and
- The MOA-Inc. approach (MOA-Inc.'s team approach).

The design and specification of the respective project infrastructure, machinery, equipment, and requirements are a highly technical exercise in itself. FOA's procurement procedure for tendering works and supply requires appointment of consultants: civil and structural consultants and mechanical and engineering consultants. These consultants in fact depend on FOA's officers to provide them with general concepts and details of the

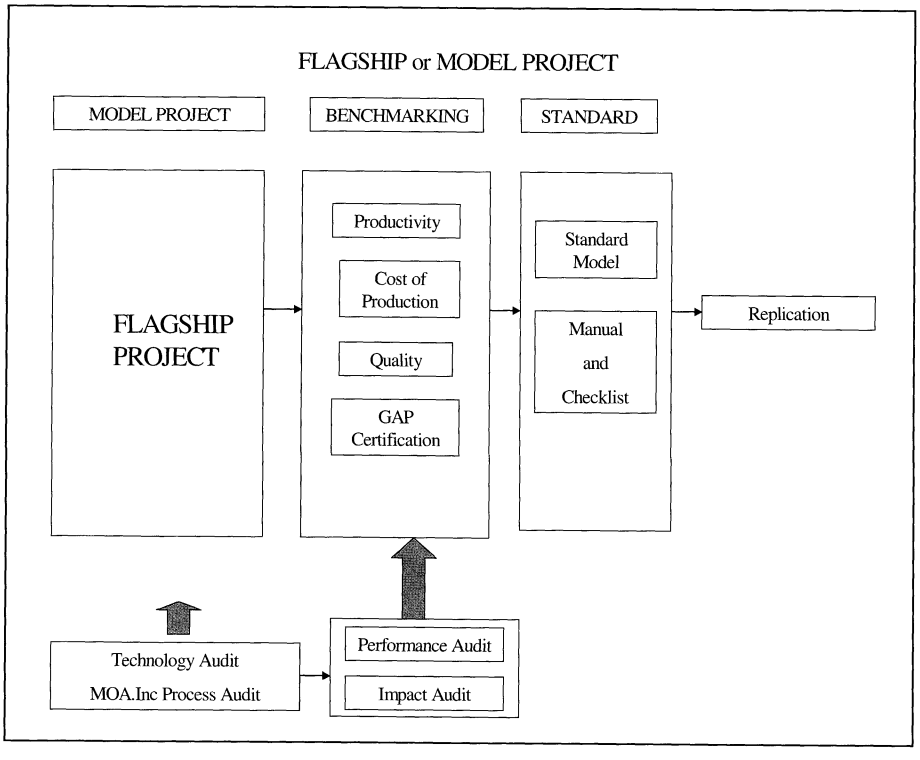
design. When the FOA technology prospecting team visits various projects, it even includes the consultants.

Evaluation of the design and specifications at various stages of their drafts is performed by a Technical Committee comprised of FOA's production division officers, who are specialized officers from relevant departments and agencies of the MOA. Sometimes, the FOA also invites private sector executives to attend the discussion to present their views.

Apart from the design and specification of projects and the procurement procedure which might not realize the desired designs, the next challenge is the operationalization of the project with new machines and equipment. Although the project management and workers may have had some training in similar projects before this, familiarization with a new operation and especially discovering deficiencies and defects in the project design can involve additional expenses and can limit attainment of the benchmark target. The process of achieving a stabilized standard model is slow, and sometimes difficulties arise from human and material deficiencies.

The MOA wants assurances that the model projects are indeed models of technology and GAP practices, and has instituted technology auditing and MOA-Inc. process audits.

A wave of transformation is expected from replication of successful models, where prospective takers only need to start from the standard model and manual of operation of the prospects. This process is illustrated in the chart below.




# Transfer of Technology

### Transformation Business Plan

All AFOs are required to prepare a Transformation Business Plan (TBP) for their respective operational areas. The TBP reviews and compiles the current status of crops, demographic profiles of farmers and producers, current agricultural practices, land availability, and new agricultural enterprises and trends in agricultural modernization in the AFO's area. The choice of the transformation approach and modernization efforts are decided based on situational SWOT analyses of the area. Having identified the areas to be modernized, suitable standard models are also identified.

### Communication Process

Basically, the AIDA (awareness, interest, desire, and action) communication process model as illustrated below is adopted.

**Transfer of Technology (TOT) – Communication Process**

| | Desired Response | Strategy |
|---|---|---|
| **Communication Model** | **Awareness** | • Lectures<br>• Fliers<br>• FO news bulletins<br>• Seminars<br>• Village-level meetings<br>• General assembly meetings |
| | **Interest** | • Study visits<br>• Success stories |
| | **Desire** | • Visits<br>• Courses |
| | **Action** | • Courses<br>• Attachment courses<br>• Incubator programs |

## Awareness

Efforts at raising the transformation awareness and interest and keeping them at a high level are continuously undertaken at every available opportunity and occasion. Transformation issues are made standard agenda in village-level meetings, AFO Board of Directors meetings, and during the Annual General Meeting. Fliers and FO news bulletins also discuss agricultural transformation and technology.

### Success stories

Success stories via VCD (video cassette disc) presentations are communicated to the target group during the AFO AGM Farmers Convention, and Farmers Day celebration visits are also made to farms of successful farmers.

### Courses and attachment training

Courses are also organized for interested farmers who desire to undergo more-formal learning, to gain appreciation and knowledge of the particular modern agriculture production model. For the committed farmer-entrepreneur, FOA/FOs also arrange for them to undergo attachment training for the full cycle of production (related to marine shrimp farming, poultry closed-house operations, or chili/tomato production by fertization) or on a modular scale related to particular activity or tasks. Attachment training is arranged at FO model projects or at the farm of a successful farmer. Champion farmers are also invited to lecture and do demonstrations.

**Incubator program**

Departments and agencies under the MOA also run incubator program for production operations related to capital-intensive, technology-based production such as mentioned above (vegetable production by fertization and fish and shrimp fry production). Under the incubator program, interested producers are allowed to use the complete production facilities for a certain period of 6 months (one cycle for fertization and shrimp farming) or 2 years, renewable for another 2 years, and an optional 1 year (2 + 2 + 1 years). The entrepreneurs have to use their own working capital for the operation, and have to pay rental and utility bills, but the relevant departments and agencies provide technical support to the entrepreneur.

**Networking and support group approach**

FOA/FOs also organize focus-group discussions among farmer-entrepreneurs involved in the same type of production enterprises. Such discussions are also attended by extension officers, research officers, and even suppliers. Practicing farmers have admitted that with effective moderation, the sessions have been very productive compared to the conventional lecture approach. The exchange of experiences among producers and with other resource persons provide proven solutions to some problems experienced by certain farmers. Extension workers and research officers also gain from the sessions. Their interactions inadvertently develop into effective networks and support groups.

The more-successful entrepreneur farmers have even established an exclusive club at the behest of the Minister. The club organizes talks by invited speakers, and also visits organizations and farms to add to their knowledge and networking. Currently two main clubs have already formed: the Farmer Entrepreneur Club and Paddy 10 Metric Tonnes Club.

**Mentor-student**

FOA/FOs have also organized successful farmers to collaborate with new farmers, based on the mentor-student model. There is the case of a young successful large-scale vegetable producer collaborating with four new producers who do not yet have sufficient experience and market contacts.

## Conclusions

The transformation process may involve a complete package from just productivity improvements to full-fledged modern farms practicing sustainable farming. The FOA/FO's transformation program with respect to the TOT and its enablers is summarized in the following chart.

## Transformation Program

| Transformation | TOT | Enablers |
|---|---|---|
| Productivity | 1. Manual<br>2. Advisory services | • Technology package<br>• Supervised farm credit<br>• AFOs as integrators |
| GAP Certification | 1. Guidance<br>2. Advisory services<br>3. Lectures<br>4. Courses | |
| Modernizing Agriculture Practice | 1. Standard model<br>2. Manuals<br>3. Success stories<br>4. Visits<br>5. Courses<br>6. Networking | • Incubator programs<br>• Enablers |
| Entrepreneurs | -- as above -- | • MOA–Inc. support<br>• Agriculture loans<br>• Mentor-student<br>• Enablers: land |

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