

Strategic Direction in Developing Taiwan's Innovative Agriculture

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The development of innovative agriculture is a mainstream strategy towards the enhancement of overall competitiveness under the globalization of free economies. It is critical to position innovative agriculture in technological, management, and humanity innovations, with supplement of value-added local specialties. The interdisciplinary collaboration of developing innovative agriculture in Taiwan will be a technology embedded commercial operations in various professional fields for competing on a global basis.

Council of Agriculture (COA) positions its policy in developing an integrative value additions across several businesses. For examples, a collaborative mechanism has been established between agriculture and business including the animal vaccine and ornamental fish industry. The major efforts aim at regenerating rural communities with specialties of agricultural products and rural tourism. In order to support the objectives, professional farmers at young generations have been raised by educational projects. In addition, the applications of ICT can further upgrade business operational capabilities and entrepreneurial initiatives.

I. Promotion of technological innovation to encourage entrepreneurship

COA established the Agricultural Technology Research Institute (ATRI) in January, 2014. The purpose of the institute is to provide services to farmers, farmers' associations, and agribusinesses regarding agricultural technology, commercialization, and industrialization in order to develop agricultural innovative businesses and internationalization.

ATRI undertakes the research and development (R&D) outcomes from research organizations under COA in addition to collaborative value added applications on R&D outputs, which might include technology development of mass production applications, standard setting, usability evaluation and analysis, intellectual property protection and configuration, brand design and marketing. Moreover, ATRI plays a role in consulting and transfer for product and business commercialization to achieve the policy goal of "building agricultural technology industry as an innovative industry in Taiwan and encouraging a new era of agriculture incorporating with collaborations between agribusinesses and farmers".

COA already selected nine-star industries to develop the international market in 2015, including animal vaccines, feed additives, bio-pesticides, grouper model farms, testing and inspection techniques, ornamental fishes and peripheral products, new plant varieties and seeds, mushrooms, agricultural machineries. The inquiries raised by the industries will be resolved by the academia, which is planned as the model of collaborations.

COA also integrates the strength between academia and industry. It is very important to strengthen industry competitiveness to obtain market opportunities in the following eight strategies: strategic analysis of industry development, integration of agricultural incubations, industrialization of applications on key technologies, strategy of industry value additions, acquisition strategy of intellectual property rights, outsourcing research services for global order taking, technological agribusiness counseling, and human resource breeds of

international marketing talents. These strategies intend to promote the development of agricultural technology industries.

Furthermore, aiming at upgrading the agricultural industry, COA will actively visit and check those agribusinesses with potential capabilities in agricultural technology for further development. COA provides assistances including industry system model, multiple innovations of management, and supporting resources for system improvement. In addition, proposals of innovation and improvement for business operations and management are encouraged, which will be beneficial to business capabilities of management and innovation as well as a strong system towards an overall industry development.

COA plans to facilitate 18 company cases towards the participation of agricultural venture capital platform. Via this platform, those agribusinesses willing to go the IPO can get counseling regarding cost structure and financial model to proceed into the capital market. The initial plan is to assist six agribusinesses to go into IPO in order to demonstrate how agribusinesses can take advantages of the external capital for a scaled up operation.

II. Innovative business model for agricultural value-added

1. To integrate agri- aqua special zones for agricultural and business collaborations, COA intends to create the synergy by industry resource integration. It provides counseling to push forward agri- and aqua- special zones for safety management and standardization of production. Furthermore, the plan for core tasks in linking production with sales could be very market-oriented towards new value of the agricultural industry, including establishing agriculture and business collaborations, profit sharing system, risk sharing mechanisms, and development of new business opportunities.

Take agricultural production grouping zones for example, COA provides counseling to facilitate the local farmers' associations to make contract deals with farmers who produce vegetables with exporting potentials or farmers in flower planting conglomerates. The modern set of product selection and distribution can be done collectively. The common efforts on packing and quarantine standardization operations can enhance international market competitiveness and match farmers' associations with exporting agribusinesses to stabilize supply and demand gap and further to develop emerging overseas markets.

COA also promotes the marketing planning of fruit sales and lead toward integration of production value activities starting with contracting production for stable outputs. It suggests a shareholding and profit-sharing model to motivate agricultural participants in collaboration with businesses, which can secure sales in correspondence with production. For example, the tea industry is integrated by setting tea production conglomerates with main leading operations by tea companies or factories. It is well operated via collaborative models throughout planting, processing, and sales, by those 31 operational groups under the counseling by COA. The production size of these groups covers 455 hectares via contracting production to secure farmers' income.

There are also publicly owned organic plantation zones established by the government. The land is rented from Taiwan Sugar Corporation, or operated by Veterans Affairs Council. Also farmers and farmers' associations are encouraged to organize organic farming conglomerates in order to increase the scale of organic farming area for the benefit of industrial clusters.

For the livestock farming agribusinesses, COA aims at strengthening contracting rearing system, including pig farms, feedmills, meat processing factories, and dairy farming

and milk supply. The system is organized as a tier-satellite production system in order to secure the supply stability of raw materials in terms of the sources and quarantine standards. For poultry industry, the production of white chicken value chain activities is selected for benchmarking. It is a benchmarking model to increase the current scale of poultry production and sales groups, production cooperatives, and industry groups. COA intends to assist the industry model of commercialization of business processes via a large-scale contracting production to eventually lead to an overall industry upgrade.

COA also offers help to potential agricultural, fisheries, and livestock industry with specialties. These primary industries can combine through an interdisciplinary mode rural community regeneration projects to further develop local value-added industries and agri-tourism. By doing so, the primary industry production can extend into the secondary industry and the third service industry. The local special flavors of agricultural products can be developed into local cuisines, and being a major attraction of rural agri-tourism. Thus, the integration of primary, secondary, and third industry into the sixth agricultural revolution should eventually lead to rural community progress by local production local consumption models.

2. Promote agricultural social enterprises

Following the global trend, Executive Yuan has implemented an action plan for social enterprises since 2014 in order to provide a friendly environment for development of social enterprises in Taiwan. Building social networks and platforms is good to improve operational competitiveness and build an eco-system for social enterprises to proceed innovation, entrepreneurship, and growth.

COA plans and implements the promotion of social enterprises among young generation and rural communities in the agricultural sector island in 2015. It also increases the scope of cross-sector collaborations through rural regeneration programs by selecting and counseling agribusinesses for business transformation and further develop new business model. COA will provide modern technology, techniques, and marketing to transform rural communities into business operations. In the meantime, the feedback mechanisms from profit can be build upon a sustainable business model in social enterprise operation.

3. Plan and trial on agri-insurance

In 2014, COA plans and makes trials on agricultural insurance to stabilize farmers' income and strengthen risk management concept of farmers. The insurance intends to share common risks caused by natural disasters and reduce losses of farmers' crop damages by natural disasters. COA evaluates the feasibility of trial insurance covering natural disasters, including insurable feasibility, insurance policy planning, and insurance fee calculation.

COA invited the research institutions to analyze plantation area, geographic location, annual output value, number of farmer households in plantation, and disaster relief. In the beginning, COA selected pears as trial crops for the insurance. The trial of agricultural insurance in 2015 is implemented according to the 58th clause of Agricultural Development Act. In addition, The Non-Life Insurance Association of the R.O.C. is assigned to notice their membership companies regarding the trials of agricultural disaster insurance, and also to encourage insurance companies to actively develop insurance policies for high value crops.

III. Young manpower for agricultural innovative capabilities

The current challenge for the agricultural industry in Taiwan is the gap of manpower structure invested in the industry and how to enlarge the young generation size of manpower to join the agricultural market. COA already established The Farmers' Academy and Training Farm in order to develop professional knowledge and practical training. The Farmers' Academy intends to promote the land bank in coordination with the fallow policy and "small landlord big tenant" program, which is an important channel for young generation manpower investing in new ventures to access the agricultural land and operational capital. The project-based counseling of stable operation aims at young farmers for a trial period. It is estimated that a three-year of stable income based on agricultural activities will be able to motivate farmhouses to succeed their young generations to stay in farms and thus, gain additional 2,000 young people joining the agricultural industry. Meanwhile, to slow down the urgent problem regarding aging farmers, the three major implementations strategy are as follows.

1. Promote the service exchange platform for young farmers and rural young people:
COA continues to provide assistance to the young generation of farmers through projects. It plans to breed a total of 500 young generation of farmers as a benchmark and to integrate platforms for farm incubators, while recruiting 206 farmers during 2013 and 2014. In addition, COA promotes the recruitment of 2,500 local young farmers for the service exchange platform, with already 1,150 farmers joining 15 farmer information exchange platforms. The young farmers should be the core to drive the local collaborations towards organization, business, and multifunction. The young farmers centered marketing activities can further shape the new energy of young farming communities to be committed to safe local food production.
2. Application of ICT technology towards value-added innovations:
The application of ICT technology can build synergy via the information platform. Young farmers can receive assistance from the local government and gather as a social network via the internet social media. The clustering effect will make it easy to collect creatively, to match partners, and raise capital. As a consequence, the strategic goal of "small farmers become big entrepreneurs" can be achieved.
COA plans to provide young farmers a single window to access the internet portal and to get agricultural consultancy services. The integration of agricultural training, farming land recruitment, capital raise, production, operation, and marketing is provided at one stop to offer an all-direction service to young farmers. In addition, COA extends the land bank internet to provide information regarding public-owned land, land owned by Veterans Affairs Council, and land owned by Taiwan Sugar Company, to open for lease. Through leasing land for big scaled farming, young farmers will be able to operate towards an agribusiness and remain in stability.
3. Build the young generation as the backbone of agriculture:
COA plans a blueprint for agricultural human resource development by referring related policies in Japan, South Korea, and Germany, with an adaptation to the domestic industry situation. It is very important to explore an integrative strategy of agricultural talents in configuration of differential needs in the domestic market. This can start from a trial program between the government and industry in collaboration with recruitment, training, public-funded studies at agricultural colleges to earn degrees, and an expanded career

advice program for agricultural graduates. It will be more helpful if there are systematic summer programs and summer camps on farms recommended by COA to enhance agricultural students or graduates to become the future agricultural solid talents in a systematic way.

IV. Development of innovative agriculture for international business opportunities

1. Promote agricultural value-added policy to establish export-oriented innovative value chain:

COA will expand the existing outcome based on the operation of Pingtung Agricultural Biotechnology Park to promote agricultural value added industry. It is very important to further integrate the agricultural laws and policies for feasibility and reasonability. The aim is to develop the excellence of agricultural techniques in Taiwan, particularly in ornamental fishes and its related industries, animal vaccines, and agricultural and livestock value-added products. The Park already gathered 96 firms in the cluster with a total investment value amounting to NT\$8.91 billion.

In response to the agribusiness investment demand upon the aggressive calling for agricultural value-added firms located in the Park, Executive Yuan already agreed to expand the Park with a size of 167 hectares in total on August 5, 2014. The environment evaluation process has then immediately started in order to implement the Park development project by the end of 2015 for an increased scale of industrial clusters specifically for the agricultural industry.

2. Develop the export new business opportunity for agricultural production:

Executive Yuan already organized an “advisory board of e-commerce industry development” to respond to the current international market and global consumer trend. COA is affiliated to promote the Taiwanese agricultural products in an international marketing channel, and the e-commerce platform is one of the major developments. The first target is the China market, where local agents and e-commerce platform is a main collaborative channel for the cross-border e-commerce market.

The e-commerce channel will include mainly those normal temperature agricultural products or processing products as well as fresh fruits for story-based marketing products, such as championship tea, championship rice, and karasumi. The goal is to establish a long-term cross-border e-commerce channel for Taiwanese agricultural products.

In 2015, COA assisted the local governments, including Tainan, Kaohsiung, Miaoli, and Chiayi, to promote the export market to Japan. There were eleven agriculture and food associations who participated in the recently concluded “2015 Tokyo Food Expo” on March 2015.

COA also introduced the new tropical orchid species via a standard operation procedure of transportation and import from overseas labs. For the orchid export market, the *oncidium* with media to the American market and Brazilian Latin American market has also been assisted. The seed supply chain with competitive advantages has been enhanced by establishing a healthy labeling reputation for the overseas new business opportunities.

Lastly, the counseling is provided to process technology for the research and development of bird eggs towards multiple featured products. The brand building targets the international egg market is also enhanced by multiple efforts. The fundamental quality

is built upon the production system embedded in an upscale factory with hygiene qualification of tests. The international marketing of egg products can add values to the agricultural export market targeting at the overseas Chinese market and international outlets via a modern e-commerce channel.

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