INFORMATION NOTE

Taiwan's agricultural policy

1. Background

1.1 In Taiwan, the Council of Agriculture (行政院農業委員會) ("COA") was established in 1984 as the competent authority under the Executive Yuan in charge of the agricultural, forestry, fishery, livestock and food policies on the island.[1] At present, there are 14 departments or units established within COA and each is entrusted with specified responsibilities to assist COA in carrying out its functions.

1.2 In 2012, Taiwan's total value of agricultural production amounted to NT$477.9 billion (HK$128.6 billion), of which crops contributed the most with a corresponding share of 46.6%. This was followed by livestock (31.1%), fishery products (22.2%) and forestry products (0.1%). In addition, a total of 544 000 persons were employed in agriculture in 2012, mostly engaging in farming activities. In response to changing food consumption pattern and increased competition due to market liberalization after Taiwan's accession into the World Trade Organization in 2002, the agricultural sector has shifted from traditional farming of staple crops to production of high-value commodities in which Taiwan has comparative advantages.

[1] As part of the government's three-year restructuring programme (1 January 2012 to 31 December 2014), COA will be upgraded to become the Ministry of Agriculture (農業部).

2. Major agricultural industries

Crop farming

2.1 Rice is Taiwan's traditional crop with an annual production of about 1.2 million tons of rice from two main harvests on about 150 000 hectares of land. Consumption and production of this staple have declined over the past decade as a result of the change in dietary habits and increased import competition. In response, Taiwan's researchers have refined rice cultivation techniques and developed new high-quality varieties (e.g. organic rice) for domestic consumption and export. A number of policy measures have also been put in place by the Taiwanese government to help enhance the quality of rice production. These include the accreditation of agricultural products, food traceability system, and a grading system to phase out the production of inferior rice.

2.2 Due to climate diversity, a variety of fruits and vegetables are also grown in Taiwan. In 2012, 2.7 million tonnes of fruit and 2.7 million tonnes of vegetables were harvested and the export value of which totalled US$177.9 million (HK$1.4 billion) and US$167.1 million (HK$1.3 billion) respectively. The Taiwanese government has put great efforts into promoting exports, and local fruit growers have adjusted their cultivation and marketing methods against increased import competition. Meanwhile, some orchards have been transformed into agro-tourism destinations.

2.3 Tea is another world-renowned agricultural product of Taiwan. In particular, the oolong tea accounts for almost one-fifth of the world's production. However, Taiwan's tea exports have been on the decline in recent years: 14 902 tonnes of tea were harvested in 2012 and only 3 100 tonnes were exported. In response, tea growers have focused more on domestic market and authentication of their products through the traceability system and registration for certification trademarks. Some tea growers have also opened up their tea farms to tourists, offering tea sampling and guided tours showing various stages of tea production.

Livestock farming

2.4 Taiwan's modernized livestock farming industry has grown steadily in recent years. It has become a mainstay of the agricultural sector, thanks to technical innovations (particularly in feeding and breeding skills) and increased demand for animal-protein foods. In 2012, the three major livestock products were hogs, chickens and eggs in terms of their total value of agricultural production.

2.5 The livestock industry has recently undergone restructuring to boost its product competitiveness through strategic business alliances, enhanced disease surveillance, meat hygiene monitoring systems, and development of brand names. A prominent example is the strategic business alliance established by the National Animal Industry Foundation (財團法人中央畜產會) to promote the brand "Taiwan Black Pig" (台灣黑毛豬)[2].

Fishery

2.6 Taiwan has over 1 100 kilometres of coastline. To the east, the world's second-strongest ocean current – the Kuroshio – brings abundant stocks of migrating fish through Taiwan's waters, while the continental shelf on the western coast provides good habitats and spawning grounds for a wide variety of sea life. More than half of Taiwan's seafood production was shipped abroad in 2012, contributing to US$2.1 billion (HK$16.3 billion) or 40% of the total value of agricultural exports.

2.7 Taiwan's fishery industry has shifted from small-scale coastal fisheries to aquaculture and deep-sea fisheries, thanks to its varied climate and advance in technology and breeding techniques. In 2012, aquaculture accounted for 27.7% of fishery production by volume and 37.3% by value. Taiwan is also a major supplier of groupers and tilapia in the world.

[2] The alliance aims at, among other things, developing a selling network which streamlines the transportation and marketing hierarchy of pork and relevant products.

3. Major policy initiatives in agricultural development

3.1 In Taiwan, agricultural policy is primarily governed by the *Agricultural Development Act* 《農業發展條例》 which aims "to ensure the sustainability of agricultural development, to address agricultural globalization and liberalization, to promote reasonable farmland uses, to stabilize agricultural production and sale, to increase farmers' income and enhance their well-being, and to raise the living standard of farmers".[3] To achieve the above statutory objectives, COA has in recent years launched a number of policy initiatives featuring the application of technology in agriculture, quality assurance programmes for agricultural products, sustainable agricultural development, and measures to promote farming and secure food supply.

Technological innovations in agriculture

3.2 Taiwan has established a competitive edge in agricultural science and technology resulting from years of investment by both the public and private sectors in agricultural research. In particular, COA supports the development of agricultural technology and promotes its application in upgrading the agricultural industries, stabilizing food supply and ensuring environmental sustainability.

Research and development

3.3 COA has established 16 research institutes for the development of innovative technologies in various domains of agricultural production, including crops, livestock, fishery, forestry, animal health and plant protection. These institutes have contributed to Taiwan's agricultural development through the transfer of technology to the private sector over the years.[4]

[3] See Article 1 of the *Agricultural Development Act*.

[4] In 2012, there were 111 cases of agricultural technology transfer involving royalty payments of about NT$76 million (HK$20.4 million).

3.4 COA also implemented a five-year programme in 2009 to promote academia-industry cooperation in agricultural biotechnology research in view of the importance of the private sector in the development and commercialization of agricultural products. By December 2012, the programme had funded 689 projects which attracted a total investment of NT$383 million (HK$103 million) from 297 enterprises.

3.5 In a further effort to promote agricultural technology, COA established the Agricultural Technology Research Institute (財團法人農業科技研究院) on 1 January 2014 to serve as a platform for transforming research results into commercially viable products and for developing competitive new produce. The institute focuses initially on animal vaccines, feed additives and biological pesticides.

Science parks

3.6 To foster the development of agricultural technology, COA has been promoting the development of science parks in a move to transform Taiwan into an Asia-Pacific centre for agricultural biotechnology and sub-tropical floriculture. Of particular importance is the establishment of the Pingtung Agricultural Biotechnology Park (屏東農業生物科技園區) ("PABP") in 2003.

3.7 PABP is the only science park in Taiwan dedicated to agricultural biotechnology. Being directly supervised by COA, PABP provides the most integrated support and incentives to park enterprises with the objective of transforming the traditional agricultural sector into agri-bio industry and ensuring the sustainability of agriculture in Taiwan. PABP occupies a total land area of 233 hectares and provides one-stop services including various governmental support, R&D funding, factory licensing, and international marketing aid. At end-2013, there were 78 park tenants in PABP categorized into six agri-bio clusters, namely (a) functional foods and bio-cosmetics; (b) aquaculture; (c) bio-fertilizer and bio-pesticide; (d) breeding livestock and animal vaccine; (e) biotechnical service; and (f) green energy automatic control facility for agro-use.

Application of information technology to agriculture

3.8 Since its launch in 2004, Taiwan's satellite FORMOSAT-2 (福爾摩沙衛星二號) has been capturing images of the island's terrestrial and marine environment. The data so collected have been incorporated into the Taiwan Agriculture Land Information Service (台灣農地資訊服務網) to help the Taiwanese government with land planning and the development of precision farming. Farmers also assess farmland availability using data on soil properties, cropping suitability, irrigation facilities, land use zoning, and feasibility of farmland consolidation.

3.9 To provide agricultural workers with more instant news and information, COA has established a mobile information platform that delivers timely notifications such as plant disease warnings. COA went further in 2014 to plan for the use of cloud computing technology to provide the farming sector with a real-time database of agricultural production and market prices. This is to complement the online service established in 2009 to provide farmers with distance consultation on agricultural techniques.

Quality assurance of agricultural products

3.10 While price and quality remain important for consumer decisions, food safety has become a major consideration as well. As such, production and processing techniques used in growing of fruit/vegetables and rearing of livestock/fish are subject to greater scrutiny in Taiwan. Reflecting this, COA has introduced a number of food safety measures and regulations including the Certified Agricultural Standards (優良農產品證明標章), Good Agricultural Practices (吉園圃), Taiwan Agriculture and Food Traceability System (台灣農產品產銷履歷制度), and *Agricultural Production and Certification Act* (農產品生產及驗證管理法).

Certified Agricultural Standards

3.11 The Certified Agricultural Standards were launched in 1989 to improve the quality of agricultural products and processed foods. These standards cover facilities, quality control, hygiene and safety for 16 food categories including meat, rice and eggs. Manufacturing facilities that have received the Certified Agricultural Standards accreditation are subject to both routine and random inspections.

Good Agricultural Practices

3.12 The Good Agricultural Practices were introduced in 1993 as a product-safety management system for fruits and vegetables. Farmers are required to use recommended pesticides in a reasonable dosage and harvest the crop within a specified timeframe without unwanted residue of the pesticides.

Food traceability system

3.13 The Taiwan Agriculture and Food Traceability System was formalized in 2007 as an online databank that provides comprehensive consumer information. Consumers can access digital records provided by participating farmers[5] on the cultivation, processing, delivery and sale of their food products that carry a traceability label. These records are available online and at kiosks in supermarkets and shopping centres.

Accreditation and certification system

3.14 An accreditation and certification system for organic foods, including crop, poultry and meats, was established in 2009 under the *Agricultural Production and Certification Act*. A total of 14 institutions have been authorized to inspect and certify organic products.

[5] Participation in the Taiwan Agriculture and Food Traceability System is voluntary.

Sustainable agricultural development

3.15 Since Taiwan's accession into the World Trade Organization in 2002, the Taiwanese government has implemented policies to restructure the agricultural sector into a more competitive and modernized green industry. For example, COA has issued regulations to ensure that pesticides are not overused to the detriment of sustainable development of the agricultural sector. It has also mapped out a "rational use of fertilizer" (合理化施肥) programme advising farmers on how to appropriately apply fertilizers and protect the environment for production.

3.16 In addition, COA has implemented a number of measures to support organic farming as more and more farmers have adopted organic farming methods.[6] These measures include setting up organic farming technical consulting teams, assisting farmers to apply for certification of organic products, promoting the use of "Taiwan CAS organic" (台灣有機農產品) logo, establishing and enlarging the specialized organic production zones, holding educational classes for farmers, and guiding retail outlets to set up special counters for organic farming products.

Livestock farming

3.17 The Livestock Research Institute (畜產試驗所) of COA has been engaging in the research of animal wastes treatments and utilization. After years of researches, the three-step treating system (三段式廢水處理系統) is now recommended to hog farmers.[7] Most hog farms in upland areas are located closed to tea plantations and orchards. After the pig wastes have been separated into solid and liquid, the solid portion can be used as organic fertilizer by tea and fruit growers.

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[6] Farmers have found success with new organic production techniques and the use of disease-resistant crop strains developed mostly by publicly-funded research teams. The area of farmland certified for the organic cultivation more than doubled during 2008-2013 to 5 930 hectares.

[7] The materials produced from the waste treatment can be handled by the following three-step process: (a) solid-liquid separation: the separation of the solid fraction from the wastewater to reduce the content of solids for subsequent handling and treatment; (b) horizontal anaerobic fermentation: biological treatment of the remaining solid waste and biogas so generated may be used as sources of fuel for the stove, water heater, piglet warming, water pump, electricity generation, automobile etc; and (c) aerobic treatment: the sludge accumulated in a wastewater treatment process can be dehydrated and used as fertilizer.

Water-saving agricultural production zones

3.18 In many areas where aquaculture is an important industry, excessive drawing of fresh groundwater has led to severe land subsidence, causing fish ponds to collapse and whole areas to be inundated by incoming seawater. To solve the land subsidence issue and build a model region for sustainable agriculture in Yunlin (雲林) and Changhua (彰化) counties, the government has injected about NT$3 billion (HK$807 million) into an eight-year programme which was launched in 2013 to create water-saving agricultural production zones.

Measures to promote farming and secure food supply

3.19 In recent years, Taiwan has been faced with growing threats to its food security stemming from climate change and increased reliance on food imports. The Taiwanese government has set a goal of raising the food self-sufficiency rate from 32% in 2010 to 40% by 2020 through measures to promote farming and secure food supply.

Agricultural Production and Marketing Groups

3.20 Taiwan's farming sector is dominated by small-scale farms, which makes it difficult to accumulate capital to expand the scale of operations and introduce mechanized cultivation methods to increase production. Against this, COA has brought together farmers who grow the same crops in a neighbourhood to form the "Agricultural Production and Marketing Groups". Through the cooperation in joint funding and production, as well as the sharing of sales channels, teamwork is achieved for mutual benefit and bargaining power of participating small-scale farms.

Small Landlords, Big Tenant Farmers

3.21 The "Small Landlords, Big Tenant Farmers" (小地主大佃農) programme was rolled out by COA in May 2009 to revitalize many small and fallow plots of farmland scattered throughout Taiwan, often owned by elderly farmers. Those unwilling or no longer able to cultivate their land are encouraged to lease to young professional farmers or agricultural groups. The tenant-farmers receive guidance on expanding their business scale, incentives for growing import-substitution or exportable crops, as well as other incentives such as interest-free rent loans, low-interest business loans, farming equipment grants and disaster relief assistance.

3.22 As at end-2012, the programme helped 18 265 landowners lease 9 579 hectares of farmland to 1 328 tenants. The average farm size operated by a tenant was 7.2 hectares, about seven times that of ordinary farms, which averaged 1.1 hectares. In addition, the average age of tenant-farmers was 44 years, against the average of 62 years for other farmers across Taiwan.

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