Taiwan special

# Growing cross-cultural exchange

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Oct. 10, also known as Double Ten Day, is the national day to celebrate the founding of the the Republic of China (Taiwan). This year marks the 104th anniversary of the Xinhai Revolution of 1911.

Taiwan and Japan, deeply connected historically, geographically and culturally, have maintained a long-lasting bond of friendship and are promoting close interactions in diverse fields. Taiwan President Ma Ying-jeou, since taking office in 2008, has positioned the relationship as a "special partnership" and achieved significant results such as enhancing exchanges with Japan in all fields with utmost effort and having signed 25 agreements and memorandums so far.

On June 12, Taiwan Cultural Center of the Taipei Economic and Cultural Representative Office opened in Tokyo's Toranomon district. The center will create a bridge of cultural exchanges between Taiwan and Japan. We intend to deliver Taiwan's soft power through various events in music, literature and art in the future.

In August, Japan's Takarazuka Revue theater troupe conducted its second tour in Taiwan, performing its best-known "The Rose of Versailles." As with the previous tour in 2013, the group's performance proved greatly popular. In autumn 2016, the exhibition, "Collection of Japanese Courtly Art," is scheduled to be held at the southern branch of the National Palace Museum in Chiayi, Taiwan.

I am delighted to see the wide-ranging bilateral cultural exchanges and both peoples further deepening their interests in mutual cultures.

In 2014, the number of visitors traveling between Taiwan and Japan exceeded 4.6 million. While around 1.63 million tourists traveled from Japan to Taiwan, around 2.97 million traveled from Taiwan to Japan; the most among tourists visiting Japan. At the Taiwan-Japan Summit on Tourism held in May in Yamagata Prefecture, representatives jointly announced a target of 5 million visitors traveling between the two countries.

Japan is Taiwan's third-biggest trade partner, and Taiwan is Japan's fourth-largest trading partner, thus the two are tied very closely to each other economically. Taiwan serves as an important hub of Japanese companies' supply chains in the Asia-Pacific region. Both are complementary to each other in their trade and economic relations, and I believe it would be beneficial for mutual economic and industrial progress in the future to promote industrial cooperation and market development in collaboration with third-party countries in Southeast Asia.

We would like to further work toward signing a free trade agreement, economic partnership agreement and double taxation avoidance agreement between Taiwan and Japan. At the same time, in collaboration with Japan, we continue to promote the participation in the reginal economic integration such as with the Trans-Pacific Partnership Agreement and the East Asia Regional Comprehensive Economic Partnership. Furthermore, we are determined to actively cooperate with the international society, not only in economy, but also in humanitarian support and prevention of epidemics and disasters, thus contributing to peace and security in Asia.

Finally, I extend my best wishes for the continued good health and happiness of all, as well as for the further development of friendship between Taiwan and Japan.

## Eco-friendly, organic farming enjoying strong growth

When Chou Chun-chi was an undergraduate in the mid-1980s, he often spent his free time riding his motorcycle along the narrow roads that separate the farms of central Taiwan. A diligent student of plant pathology, he would glance at the crops as he passed by, pulling over if spotted any signs of disease. He would then seek out the farmers responsible for the fields so he could discuss the matter with them and offer some advice. "I'd recommend pesticides, which often proved quite effective," recalls Chou, who went on to earn a Ph.D. in plant pathology from National Chung Hsing University in central Taiwan's Taichung City.

In the decades since, the 51-year-old has radically changed his approach to agriculture. While conducting postdoctoral research in the U.S. in the early 2000s, he witnessed firsthand the growth of organic farming and came to appreciate the advantages of eco-friendly methods of cultivation. In 2005, Chou co-founded Tenha Organic Farm. At that time, it was the largest farm of its kind in Taiwan. "I could see that organic agriculture was going to become popular in Taiwan just as it had done in the U.S., and I was eager to help develop this practice in my own country," he explains.

Chou's prediction concerning the growth of the sector has been borne out since he established Tenha. His farm — which initially occupied nearly 10 hectares, hence its name, before later being enlarged to 16 hectares — has since been surpassed by several others in terms of size. At present, the largest such farm in the country spans 79 hectares. According to the Agriculture and Food Agency (AFA) under the cabinet-level Council of Agriculture (COA), there were 6,071 hectares of officially certified organic farmland in Taiwan last year. This marked an almost 390 percent increase from 2004, when the country was home to 1,246 hectares of certified organic cropland.

Compared with the West, Taiwan is a late adopter of these practices. The first step toward the introduction of such methods was taken in 1987 when the COA launched a program to assess the feasibility of establishing organic farms. In 1990, an affiliate of the Japan-based Mokichi Okada International Association, which promotes integrative medicine, eco-friendly farming and the arts, was set up in Taiwan. This was the first nongovernmental organization solely dedicated to the advancement of organic cultivation. In the following years, a number of similar groups emerged.

The government responded to the growth of the eco-friendly agriculture movement by publishing national organic standards in 1999. Another major boost to the development of the sector occurred in 2007 when the Agricultural Production and Certification Act took effect. This law regulates how organic products are produced, processed and packaged, and introduced penalties of up to 1 million new Taiwan dollars ($32,260) for individuals or companies that mislabel food as conforming to the official standards. The act also allows for the disqualification of certification bodies found negligent in accrediting organic farmland. Additionally, the AFA performs regular spot checks on products labeled as organic to ensure the integrity of both growers and certifying organizations.

**Tenha Organic Farm in Tainan has enhanced its production efficiency by adopting the latest eco-friendly farming practices and technologies.** HUANG CHUNG-HSIN

*This article is an edited excerpt from Taiwan Review.*

**Visitors gather around Howard Ho's booth at an invention exhibition to try his eye-catching inflatable drum kit.** COURTESY OF HOWARD HO

## From concept to commercialization

Like many inventors, Howard Ho finds his best ideas evolve out of a desire to solve problems in the lives of those closest to him. His latest creation, an inflatable electronic drum kit, is a case in point. He conceived the device after seeing the frustration his teenage son, a budding drummer, was experiencing as a result of being unable to practice at home due to noise. "Most parents want to give their children the best possible opportunities to explore their interests," says Ho, an assistant professor in the Department of Information Management at Yuanpei University of Medical Technology in northern Taiwan's Hsinchu City. "That was certainly my motivation when I started brainstorming solutions to my son's problem."

In April 2014, the professor devised his innovative solution to this dilemma. Ho's inflatable drum kit has a polyvinyl chloride body, and drumheads and cymbal surfaces containing integrated circuits and pressure sensors. His creation is affordable, lightweight and can be inflated and deflated with relative ease. It also has volume controls and is practically silent when used with headphones.

Confident that he had developed a device with broad appeal, Ho sought patent protection for his invention in mainland China, Taiwan and the United States.

Around this time, a team from the Technology Transfer Center under the government-supported Industrial Technology Research Institute contacted Ho. The center, which helps inventors commercialize their innovations, reached out to Ho to discuss his numerous patents, and became particularly interested in his latest creation. After evaluating the commercial potential of the inflatable drum kit, the team helped the professor obtain a government subsidy of 200,000 new Taiwan dollars ($6,450) to build a prototype. The center also recommended that he take part in the Taipei International Invention Show and Technomart, an annual exhibition organized by the semi-official Taiwan External Trade Development Council.

The device attracted interest from several Taiwanese companies at the show last September, and within a few months Reliance International Corp., best known for producing drums under the brand name Dixon, and Inyuan Technology Inc., a karaoke machine manufacturer, had formed a joint venture with Ho called MusicAir Technology Co. to commercialize his prototype. "I'm upbeat about the market potential of inflatable drum sets as they're a convenient and economical solution for beginners," he says.

Far from an exception, Ho is among a large number of Taiwanese inventors who have excelled at international exhibitions in recent decades. In order to harness the economic potential of these innovators and their creations, the government has developed programs that offer inventors expert advice on patent protection and commercialization as well as matchmaking and networking opportunities, subsidies, and technical support.

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# Aid through aquaculture

**Above: Workers engage in tilapia production in Saint Lucia in the eastern Caribbean Sea. Right: Workers collect milkfish at an aquaculture pond in the Pacific nation of Kiribati.** COURTESY OF TAIWAN INTERNATIONAL COOPERATION AND DEVELOPMENT FUND

Taiwan uses its leading-edge expertise in fish farming to help boost nutrition and economic development in nations around the world.

Delicious, tender grouper graces many a global dinner table with Taiwanese fish farmers a leader in world production. Many people know about this tasty entree, but few are aware of its interesting and peculiar sex life. Grouper start off life as females before some later change sex to males when six to eight years old. To manage this unusual reproductive cycle, Taiwan's fish industry and government researchers have developed a range of leading-edge technologies such as artificial insemination and hormone treatments to induce spawning, as well as sex change in females.

Taiwan's remarkable success in cultivating grouper results from this technical expertise, and in particular its ability to overcome specific challenges related to breeding. In fact, the nation currently enjoys global leadership in artificial propagation methods for seven grouper species, breeding more varieties than any other country. Taiwan is the world's top exporter of pond-raised grouper in terms of production value, with its grouper farming sector accounting for $245 million of the nation's $1.3 billion in aquaculture output in 2013, according to the Taiwan Fisheries Yearbook published last year by the National Fishermen's Association of the Republic of China (ROC).

Recognizing this expertise, Saudi Arabia turned to Taiwan when it sought to develop marine aquaculture. The Middle Eastern nation, which lacked experience and technical personnel, appealed to the ROC Ministry of Foreign Affairs (MOFA) for assistance, and a seven-year cooperative project commenced at the beginning of 2011. Under the initiative, the Taiwan International Cooperation and Development Fund (TaiwanICDF), a government-supported nonprofit organization, established a partnership with the Saudi Ministry of Agriculture's Fisheries Research Center in Jeddah as well as the National Agriculture and Animal Resources Research Center in Riyadh. The Fisheries Research Institute (FRI) under the ROC Council of Agriculture also offers scientific expertise to the Saudi institutions.

Liu Fu-guang, deputy director of the FRI, explains that aquaculture has been practiced in Taiwan for more than 300 years, so it makes sense that Saudi Arabia would approach the nation for assistance. "We dispatch experts working for Taiwan's global projects to help locals overcome problems. This might involve cultivating live micro-organisms like rotifers and daphnia to feed the grouper fry in Saudi Arabia," he says. "But we also host annual one to two-week workshops for Saudi staff at our Mariculture Research Center in Tainan or the Tungkang Biotechnology Research Center."

The $1.5 million project with Saudi Arabia seeks to produce stocks of barramundi, or Asian sea bass, and gilthead sea bream, in addition to transferring larviculture techniques and investigating spawning cycles for orange-spotted grouper. Liu notes that there are many challenges involved in conducting grouper aquaculture and research. "A problem for induced breeding occurs when the female is mature, but the male is not," he explains. There is an immediate solution, he notes, which is to cryopreserve sperm of mature grouper males at minus 70 degrees Celsius for future use.

"There is a broader problem, though, of naturally inbred grouper lines. This decreases survival rates and growth rates," Liu adds. "The Saudi project seeks to understand this by implanting individual spawners with GPS biochips to track their breeding patterns."

Taiwan's long-standing friendship with Saudi Arabia relates to the period in the 1970s when the nation represented Taiwan's third-largest aid donor after the United States and Japan. ROC President Ma Ying-jeou stated in the preface to the 2009 MOFA "White Paper on Foreign Aid Policy" that the $100 million in aid Taiwan received annually in the 1950s helped propel the country's rapid economic development. Accordingly, the president noted, "... the people of Taiwan have long held the consensus that the nation is obliged to repay its debt and fulfill its obligations to the international community."

So, not only does Taiwan oblige those like Saudi Arabia who aided it in earlier days, but it also helps less fortunate nations that require economic and other forms of assistance. In particular, the ROC focuses on providing technical support to its 22 diplomatic allies around the world.

Over the last decade, TaiwanICDF spent $17 million supporting a dozen aquaculture projects in eight Latin American nations, the Pacific nations of Kiribati and Tuvalu, and Saudi Arabia. Lee Pai-po, deputy secretary-general of TaiwanICDF, credits the success of these programs not only to funding from MOFA and the support provided by the FRI, but also to the close involvement of National Taiwan Ocean University in the northern city of Keelung. "Projects are proposed in a bottom-up fashion, that is, following the agenda of each nation we work with," Lee explains. "A needs assessment occurs in Taipei prior to approving any projects."

**Emelin Charles at her aquaculture farm in Saint Lucia** EMBASSY OF THE REPUBLIC OF CHINA (TAIWAN) IN SAINT LUCIA

The ROC's aquaculture programs in Latin American have typically focused on tilapia, a globally popular freshwater fish. Taiwan is a major producer of this species. The value of its tilapia aquaculture industry, concentrated in the southern county of Yunlin, stood at $110 million in 2013, according to the 2014 Taiwan Fisheries Yearbook. To date, Taiwan has completed tilapia aquaculture capacity-building projects in the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras and Paraguay.

Working with international aid groups such as Food for the Poor (FFP) and World Vision, TaiwanICDF helps establish sustainable aquaculture programs. These cooperative projects also enable Taiwan to impart its expertise to the international nongovernmental organizations. For instance, FFP and TaiwanICDF jointly founded a Haitian aquaculture program in November 2009 — only two months before the disastrous magnitude-7.0 earthquake in the Caribbean nation — designed to improve dietary nutrition while establishing an aquaculture industry. As part of this project, an FFP worker joined TaiwanICDF's training course for project technicians. Upon completion of the Haitian project at the end of 2012, TaiwanICDF handed over tilapia program management to FFP.

TaiwanICDF manages ongoing aquaculture projects in English-speaking Belize and Saint Lucia, as well as Paraguay. The island nation of Saint Lucia is currently expanding its tilapia production with TaiwanICDF assistance, while also pursuing aquaculture cultivation of giant freshwater prawns. Other nations that benefited from Taiwanese expertise in production of this crustacean include Honduras, El Salvador and the Dominican Republic.

James C. P. Chang, the ROC's ambassador to Saint Lucia, notes that these programs provide substantial benefits to local populations. "A woman named Mrs. Emelin Charles attended one of our prawn workshops because her banana business was failing due to a local fungal disease," he recalls. "Entering the class almost crying because she couldn't afford school tuition for her family, she is now doing quite well as a prawn entrepreneur." Local leaders appreciate Taiwan's support. Senator Berthia Parle says that "I just loved Ambassador Tom Chou when he was here, helping local people with tilapia fish, with aquaculture."

Saint Lucia, a major banana producer, may be able to apply Taiwanese research to further develop its prawn aquaculture industry. TaiwanICDF deputy secretary-general Lee, who holds a Ph.D. in agricultural technology, created the "Journal of International Cooperation" to highlight technical work not only by Taiwanese researchers, but by their counterparts in allied nations. A September 2014 article written by Lee and scientists from the National Pingtung University of Science and Technology in southern Taiwan's Pingtung County focused on how compounds in banana peels may improve the health of prawns. "The results indicated that natural plant extracts, such as banana peel extract, when applied to prawn cultivation, not only possess antibacterial qualities, but also enhance immunological responses, which reduce the mortality of prawns," Lee explains. This kind of beneficial research may be incorporated into future TaiwanICDF aquaculture workshops.

Meanwhile, the ROC's aquaculture support in the Pacific nations of Kiribati and Tuvalu centered on cultivating saltwater species. TaiwanICDF completed a three-year aquaculture project in Tuvalu in 2013 focusing on production of milkfish, another species Taiwan produces in large quantities. Taiwan's milkfish aquaculture, focused in the southern city of Tainan, represents a $163 million industry, according to the Taiwan Fisheries Yearbook.

The Kiribati project also concerned milkfish, but in an extremely ambitious and more complex fashion. The ongoing six-year TaiwanICDF initiative there, which commenced in 2011, entails producing 30 million milkfish roe, leading to 3.4 million larvae and a total of 520,000 milkfish for release into surrounding ocean waters. Other aspects of the large-scale program include organizing 18 workshops for 600 people.

What makes the Kiribati project particularly fascinating involves the fact that milkfish, per se, do not represent the ultimate goal of the project. While the initiative provides locals with a way to decrease their traditional reliance on wild-caught milkfish fry, and repopulates local waters with milkfish, these results actually stand as a means to an end. Ultimately, the people of Kiribati have set their sights on another target, the much more valuable tuna. Around 200,000 of the farmed milkfish are intended to serve as baitfish for longline tuna fishing operations.

The project also offers wider benefits. TaiwanICDF's report on the initiative notes that the know-how that local workers gain from this project "... can be extended to livestock, which will benefit many other farmers by reducing the need to import thousands of tons of animal feed from other countries." Broader impacts such as this are a key goal of Taiwan's technical assistance work. By imparting its world-leading expertise to its diplomatic allies, the ROC seeks to build aquaculture industries as part of its overall promotion of economic development.

*This article was written by Darryl E. Brock, an adjunct assistant professor of history at Central Connecticut State University in the United States, a recipient of the Taiwan Fellowship, and the co-editor of "Mr. Science and Chairman Mao's Cultural Revolution."*