

INSIGHT

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Verdant Island

Botanists are cataloging Taiwan's native plants in a bid to protect threatened species.

BY OSCAR CHUNG

PHOTOS BY CHIN HUNG-HAO



Previous visitors to Taiwan are doubtless familiar with the blue hues of the NT\$1,000 banknote issued by the country's Central Bank. But they may not have noticed the small plant design tucked away on one corner of the bill. The image was originally thought to depict a Yushan thistle, an endemic plant named after Taiwan's tallest mountain, but the designers were revealed to be mistaken thanks to a five-year research project. Led by Tseng Yen-hsueh (曾彥學), a plant expert at National



Chung Hsing University in the central city of Taichung, the study found the thistle shown on the banknote differed subtly from the Yushan variant. In February 2019 the team declared the discovery of the Tataka thistle, adding to the nation's many unique species.

“Correct taxonomy is vital to conservation efforts,” Tseng said. “All organisms have their place in the world. Our job is to try and protect them.”

Taiwan's varied plant life makes it a natural research focus for scientists

like Tseng. This abundance of flora is recorded in “The Red List of Vascular Plants of Taiwan,” a report published three years ago. Work on the list began in 2008, involving more than 50 academics from around the country who conducted the most thorough analysis of its kind to date, according to the Endemic Species Research Institute (ESRI) in charge of the project under the Cabinet-level Council of Agriculture (COA) in the central county of Nantou. The report employs the classifications from the Red List of Threatened

Taiwan's diverse landscapes are home to many endemic plant species.

Courtesy of Forestry Bureau



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Species created by Switzerland-based International Union for Conservation of Nature (IUCN), one of the leading organizations involved in protecting biodiversity around the world.

Nonvascular plants such as mosses, liverworts and algae were not part of the research, ESRI researcher Chang Ho-ming (張和明) said, because available information for such species is often insufficient to decide on conservation status.

Thriving Ecosystem

Taiwan's red list reveals the country and its offshore islands are home to 4,442 native vascular plant species, about a quarter of which are

endemic. This figure is high considering the nation's relative size. According to ESRI, 122.7 of such species can be found in Taiwan for every thousand square kilometers, compared with 14.7 in Japan and less than 2 in the U.S.

The number has risen rapidly in the past 20 years—a preliminary survey in 2012 only recorded 4,174 species. This is thanks to a growing public interest in exploring local flora combined with widespread adoption of mobile devices, ESRI researcher Li Chuan-yu (李權裕) said. "Modern technology means any enthusiast can capture high-quality images of a plant and send it for a professional to examine."



After almost a decade of work, the Taiwan red list's final tally includes 3,426 vascular species in the categories of lower concern including those lacking sufficient data, and a total of 27 species that are either "extinct in the wild" or "regionally extinct." But it is the 195 classified as "critically endangered," 283 "endangered" and 511 "vulnerable" that concern conservationists the most. Together these are deemed as threatened plants likely to go extinct if action is not taken, accounting for 22.3 percent of all species surveyed.

Taiwan has enacted several laws to protect local flora, including the Cultural Heritage Preservation Act promulgated in 1988 targeting

specific plant varieties. Initially, 11 rare and endangered species were covered by the law, but seven have subsequently been removed from the list thanks to improvements in conservation techniques including habitat preservation and targeted breeding programs.

Of the threatened species identified on the red list, 89 percent can be found in places such as national forests, parks and nature reserves where they are protected by law. It is the remaining 11 percent, or 110 species, that demand the most urgent action, as they are often found co-existing with humans around suburban areas, roadside shoulders or rice paddy fields.

01 & 05. Terraced paddies in New Taipei City's Gongliao District are home to threatened plants like bladderwort.

02. "The Red List of Vascular Plants of Taiwan," 2017

03 & 04. Large purple orchids are replanted in their natural habitat of Lanyu, also known as Orchid Island.

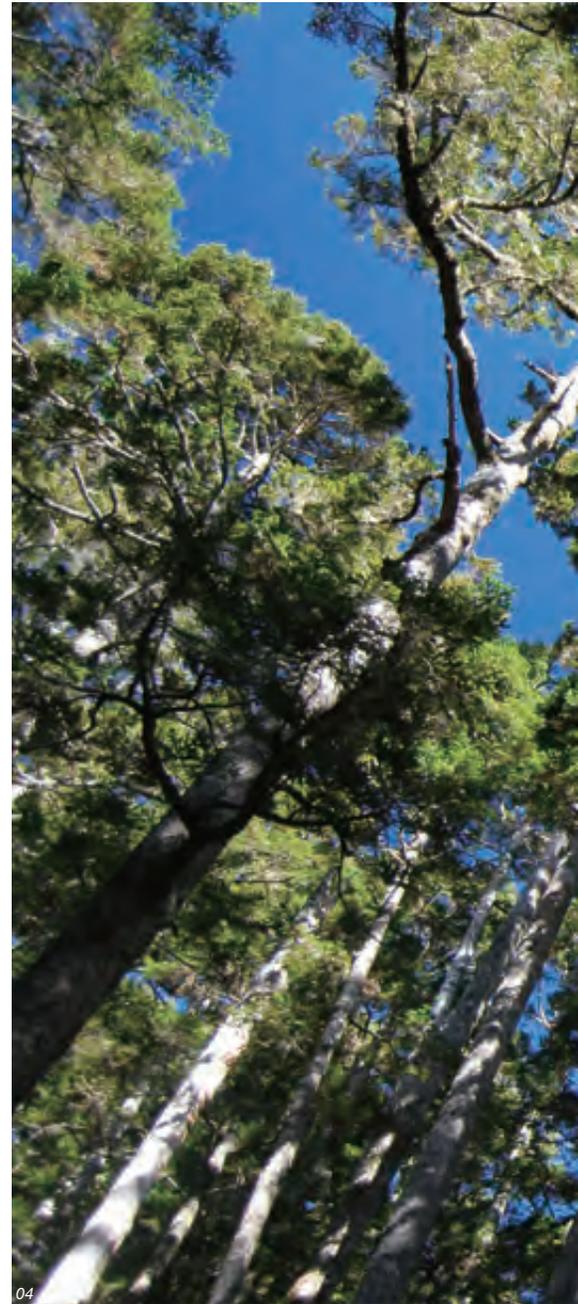
06. The Tataka thistle is a newly discovered species.

01. Courtesy of Li Wei-jie

03 & 04. Courtesy of Li Chiu-an-yu

05. Courtesy of Mong-hoho Barn Co.

06. Courtesy of Tseng Yen-hsueh



Proven Expertise

Taiwan has a positive record when it comes to saving plant species from extinction. The most recent success story involved replanting of the large purple orchid, a critically endangered variant found on Lanyu, also known as Orchid Island, and Green Island off the country's southeastern coast. In 2013, ESRI began to collect seeds from some of the less than 50 large purple orchid plants remaining on Lanyu, where the population was in



severe danger due to years of natural disasters and the orchid’s popularity among flower foragers. Researchers subsequently cultivated the species in controlled environments before introducing 500 new plants back into local ecosystems. Experts from the COA have also successfully bred varieties of the orchid that will soon be available for purchase. “It should reduce the risk of the flowers being taken from their natural habitats,” Li said.

01. The Endemic Species Research Institute in central Taiwan’s Nantou County germinates the seeds of threatened plants to provide a safe, controlled environment in the initial growth stages.
02. ESRI’s Li Chiu-an-yu, left, and Chang Ho-ming check on plant saplings before replanting in the wild.
03. The institute opens part of its grounds to the public as an educational space for displaying native species.
04. Of threatened species on the Taiwan red list, 89 percent are found in protected spaces such as national forests, parks and nature reserves.

04. Courtesy of Forestry Bureau



- 01 & 05. Fairy and yellow water lilies are two of the 195 critically endangered species on the Taiwan red list.
02. Invasive white leadtrees, upper left, on southern Taiwan's Hengchun peninsula stand in contrast to rows of newly planted native varieties.
03. Volunteers remove mile-a-minute vines, another alien species threatening Taiwan's local flora.
04. White leadtree leaves secrete mimosine, which inhibits other plants' growth.

01. Courtesy of Tsai Yi-heng
 02 – 04. Courtesy of Forestry Bureau



This strategy is combined with efforts to protect both flora and fauna in biodiversity hotspots, said Huang Chium-tse (黃群策), director of the Forestry Bureau's conservation division under the COA. "Protecting either benefits the other, as there's a symbiosis between the two; plants provide food to animals whereas animals help spread plant seeds," he added. Currently, the Forestry Bureau is overseeing 43 otherwise unprotected natural habitats around Taiwan.

One such area is terraced paddies and their surroundings in New Taipei City's Gongliao District, totaling 6.4 hectares and home to more than 750 species including seven threatened plant varieties. To maintain the ecosystem, the Forestry Bureau commissioned the Environmental Ethics Foundation of Taiwan, a nongovernmental organization based in the northeastern county of Yilan, to encourage environmentally friendly farming practices among local farmers.

Foreign Invaders

Aside from working round the clock to protect local environments, the bureau is also keenly aware of the problem posed by highly invasive foreign species. A top target is the mile-a-minute vine, a native of Latin America included on IUCN's list of the 100 worst invasive alien plant and animal species.

In the early 2000s, the government agency launched a monthlong national campaign to weed out the climbers starting in late summer every year prior to the plant's reproductive cycle. The total area infested subsequently decreased by approximately 90 percent between 2001 and 2019, from 51,852 to 5,132 hectares.

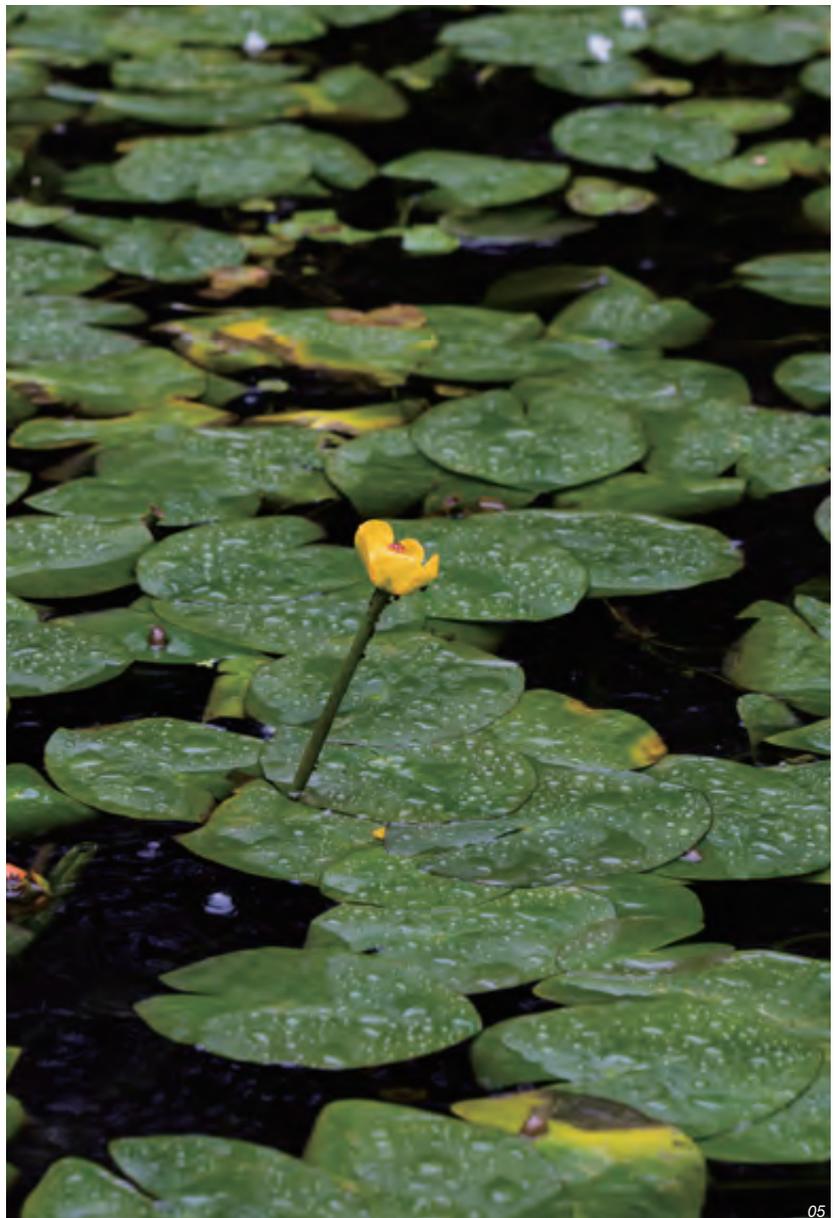
Another major target is the white leadtree, a notoriously aggressive plant native to Central America and also on the IUCN list. Its leaves secrete mimosine, which inhibits the growth of other plant life. "Where

they fall, nothing else can grow," Huang said.

To stave off this threat, the Forestry Bureau has been working since the early 2000s to replace the white leadtree with native species. Although the small, fast-growing tree can be found all over southern Taiwan, the majority of the agency's resources have focused on the population around the Hengchun peninsula on the southernmost tip of Pingtung County, which is the only area in the country covered by tropical monsoon forest. No precise measurements of white leadtree coverage

were made before the bureau's work commenced, but today it stands at less than 5,000 hectares.

According to Huang, Taiwan's red list is scheduled to be adjusted every four to eight years, based on the up-to-date IUCN standards as well as the most recent surveys of local flora. "By comparing results we can decide how effective our conservation efforts are and adjust policies to better protect threatened species," he said. "Plants are a key component of the landscapes that shape national identity. They're just as worthy of preservation as any cultural or historic landmark." 



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Willing and Able

TaiwanICDF's Overseas Volunteers Service is recruiting top talents dedicated to advancing development work in partner countries.

BY KELLY HER

PHOTOS COURTESY OF CHANG SHU-HUI

After a decade serving on the front line of Taiwan's health system as a nurse, Chang Shu-hui (張淑慧) decided she wanted to use her experience to help people abroad without access to the world-class treatment on offer at home. In 2006, she began a master's in international health at National Yangming University's Institute of Public Health in Taipei City and participated as an overseas medical volunteer for the first time.

Since then she has taken part in missions to more than 10 countries spanning Africa, the Asia-Pacific and Caribbean.

Her most recent assignment was for the International Cooperation and Development Fund (TaiwanICDF)-run Overseas Volunteers Service (TOV) in Nicaragua. During her two-year visit to Taiwan's Central American ally beginning in 2017, she conducted data compilation and analysis at a clinic, participated in

rural community health promotion campaigns and taught oral hygiene at primary schools.

"I'm immensely grateful for every opportunity I've had to share my expertise while experiencing different cultures," Chang said. "Nicaragua was probably the most fulfilling volunteer experience of them all." Tasks spanning from deploying information and communication technology (ICT) systems to raising awareness of public health issues will deliver far-reaching and long-lasting benefits for local people, she added.

Participating in TOV has made Chang more confident, having solved problems and dealt with situations that would never have arisen in Taiwan. She has also started learning Spanish after falling in love with the language during her stay abroad. "My time in Nicaragua gave me a renewed sense of purpose," Chang said. "I can't





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01 & 02. Chang Shu-hui, red shirt, teaches oral hygiene to school children in Taiwan's Central American ally Nicaragua during a mission for the Overseas Volunteers Service operated by Taipei City-based International Cooperation and Development Fund (TaiwanICDF).

03. A group of children and Chang share a happy moment.

04. Chang dispenses drugs to patients at a mobile clinic visiting a rural community.



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wait to get back overseas when the opportunity arises.”

Expanding Outreach

Taipei City-based TaiwanICDF is the nation’s foremost foreign aid organization. Since establishment in 1996, it has dispatched more than 770 volunteers to serve in 42 countries as part of work facilitating economic growth and social development in partner nations. “We’ve been diversifying our projects in recent years to adapt to changing needs,” said Wang Hung-tzu (王宏慈), director of the organization’s Humanitarian Assistance Department. “So we’re always looking for volunteers who can bring something new to the table.”

According to Wang, the numbers and types of volunteers recruited are dependent on the needs of the host country or organization, but they tend to be drawn from fields in which Taiwan excels. These include areas like agriculture, education, environmental protection, ICT and public health.

TOV has three operational goals: to dispatch qualified volunteers to projects in participating countries; to deepen Taiwan’s relationships with its allies and like-minded partners; and to promote cultural exchanges and

mutual understanding. “From our perspective, we increase the effectiveness of aid delivery by expanding our capacity and expertise,” Wang said. “In return, volunteers get to broaden their horizons and burnish their resumes with experience in a well-respected position.”

Applicants must be aged 20-65 and hold at least a bachelor’s or a minimum of five years relevant work experience. Volunteers sign up for a period of one year, but this can be extended to two years subject to performance evaluations and operational requirements.

Meeting recruitment targets is not always easy, according to Wang. Modern lifestyles combined with concerns about safety and living conditions abroad have taken a chunk out of the numbers of young people willing to sign up, she said, citing organizational statistics revealing a drop in the proportion of volunteers under the age of 35 from 81 percent in 2018 to 64 percent in 2019.

For those who come forward, satisfaction remains high, with over 90 percent of respondents to a postplacement survey indicating they were willing to do the program again. “Participants tell us they’re delighted with the changes to their self-confidence after volunteering



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- 01. Her two-year stay in Nicaragua is a defining experience for Chang.
- 02. Wang Hung-tzu, right, director of the Humanitarian Assistance Department at TaiwanICDF, is all smiles alongside TOV participants.
- 03. A table tennis practice room in Taiwan's Caribbean ally St. Lucia
- 04. Young St. Lucian table tennis players show off their medals next to TaiwanICDF volunteer coach Lien Ming-wei, left.

02. Courtesy of International Cooperation and Development Fund
 03 & 04. Courtesy of Lien Ming-wei

abroad,” Wang said. “Other benefits we hear about include improvements to cross-cultural communication, interpersonal relationships, language proficiency, problem-solving and self-awareness.”

Different Backgrounds

Lien Ming-wei (連明偉) is another happy TOV alumnus after serving as a table tennis coach in Taiwan’s Caribbean ally St. Lucia for a year starting in May 2017. “Volunteering gave me an opportunity to be somewhere totally different, meeting new people and looking at things afresh,” the 37-year-old said.

A keen athlete throughout high school and university, Lien was always particularly adept at



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table tennis. When it was time to join the world of work, becoming a pingpong instructor came naturally to him. “Being a coach is physically demanding but rewarding,” he said. “It brings a smile to my face to see students improving under my tutelage.”

Lien’s skills were just what St. Lucia was looking for to level up its national team. The island nation has a proud history of athletic success but limited resources for maintaining world-class teams. After enrolling in

TOV, Lien was assigned to discover and train primary and secondary school students with the potential to take up table tennis professionally.

According to Lien, the experience was profoundly positive, with the effects carrying on long after returning to Taiwan. “Volunteering has provided me with renewed creativity, motivation and vision that I can harness in my work and private life,” he said. “I think all young people could benefit from stepping out of their comfort zone for something like TOV.”

It is not only younger people who TaiwanICDF is looking to attract, with roles available for willing volunteers across the generations. Chen Chih-wei (陳治偉) is a typical example of someone who committed himself later in life, joining TOV in September 2017 at the age of 50 after two decades working in ICT due to the program’s excellent reputation and his desire to make a difference helping others.

“For 20 years life was all about working to support my family and



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pay my mortgage, but after achieving financial security, I felt a longing for something more meaningful,” he said. “TOV was a chance to give back.” Chen’s year volunteering for TaiwanICDF took him to Princess Margaret Hospital in Pacific ally Tuvalu, where he helped ensure smooth operation of the institution’s ICT systems.

After finishing his volunteer contract, Chen went on to take up a job working as project manager for TaiwanICDF at an ICT center in Caribbean ally St. Kitts and Nevis. He is now heading a four-year land administration information system project designed to ensure efficient and transparent transactions that will help resolve land disputes.

“If I hadn’t participated in TOV, I’d never have landed my dream job,” Chen said. “International

development is an exciting field where you know you’re making a difference.”

To get the message out about the transformative potential of volunteering, TaiwanICDF is undertaking a large-scale promotional campaign through films, lectures and presentations at universities and enterprises around the country. The organization hopes to recruit enough new talent to fulfill its ambition of expanding service provision to places that do not have official ties with Taiwan.

“Volunteers play crucial roles in virtually all of our international programs, which are tailor-made to the local needs of each partner nation,” TaiwanICDF’s Wang said. “TOV is special because all stakeholders can be sure of a positive outcome; it’s a win-win situation.”  

- 01. Lien, right, high-fives a group of his proteges.
- 02 & 03. Chen Chih-wei, left, puts his information and communication technology skills to good use helping students in Tuvalu.
- 04. Chen maintains the health information system at Tuvalu’s Princess Margaret Hospital.
- 05. Flags of the ROC (Taiwan) and Tuvalu are held aloft by Chen at Funafuti International Airport in the Pacific ally’s capital city.

01. Courtesy of Lien Ming-wei
02 – 05. Courtesy of Chen Chih-wei

Taste of Taiwan

First-class chocolates like those crafted by Fu Wan are putting the country on the confectionery map.

BY OSCAR CHUNG

PHOTOS BY CHIN HUNG-HAO

Fu Wan Resort in Pingtung County's Donggang Township, southern Taiwan, attracts visitors on the strength of its reputation for a silky-smooth night's sleep. It also packs in customers looking for a chance to experience some of the country's finest award-winning chocolates.

Chien An-chi (簡安琪), a self-described gourmand traveler from central Taiwan vacationing in Pingtung, said a visit to the resort is good for the mind, soul and most importantly, stomach. "When I heard Fu Wan was renowned for its chocolate, I had to put this claim to the test."

Big Winner

Fu Wan is the latest tearaway from Taiwan to turn the heads of the critics. At the 2019 International Chocolate Awards (ICA), the most prestigious contest for producers of dark, flavored, milk and white creations, 11 Taiwan-based participants bagged at least one award. A glutton for glory, Fu Wan scooped





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up 28—a record for a homegrown brand. The five gold-winning products include Taiwan No.1 Ping Tung Chocolate, for 62 percent cacao in plain/origin dark bar, and Taiwan Tie-Guan-Yin Tea, for 62 percent cacao in dark chocolate bar with an infusion or flavoring.

Triumphing at ICA is no mean feat. Since its launch in 2012, the event has become the first and last word in chocolate excellence. Preliminary competitions are held around the world to sort out the wheat from the chaff on the road to the finals, which were held last November in Taiwan’s Central American ally Guatemala.

Fu Wan made its bow at the ICA final in 2016, just two years after opening for business. It went on to win honors at the competition



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01. Cacao pods are freshly harvested for beans used by Fu Wan Chocolate.
02. Fu Wan’s high quality chocolates are attracting interest at international contests.
03. Warren Hsu introduces his chocolate products with Fu Wan’s sales associates.

02. Courtesy of Fu Wan Chocolate



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- 01. A cacao farmer checks his crops.
- 02 & 03. Cacao beans are removed from pods and fermented in buckets.
- 04. Hsu sorts the fermented beans to dry them outdoors.
- 05. A new batch of Fu Wan chocolates is ready to be packaged.
- 06 & 07. Fu Wan makes various products, including Taiwan No.1 Ping Tung Chocolate with 62 percent cacao, a gold winner at the 2019 International Chocolate Awards.

01. Courtesy of Fu Wan Chocolate

for the next three years. As Taiwan's chocolate-making reputation gained luster via ICA, it earned the right to host Asia-Pacific preliminaries in 2018 and 2019.

Passion Project

The recipe for Fu Wan's success comprises many ingredients, most notably ambition. Warren Hsu (許華仁), operator of the resort and founder of the brand, had long been searching for a passion project to develop into a world-class product. In 2015 when the resort celebrated its fifth anniversary, Hsu had a revelation: Pingtung was Taiwan's cacao-growing mecca.

Wasting no time, Hsu built connections with local cultivators of the key chocolate ingredient, as well as completed level one and two courses in chocolate tasting offered by London-headquartered International Institute of Chocolate and Cacao Tasting. In 2017, he became the first from Taiwan to complete the best-of-the-best level three course in Peru, the spiritual home of cacao in South America.

Jade Li (黎玉璽), a former Fu Wan chocolatier, views Hsu's approach to professional development as correct if one is to possess a command of the process of chocolate-making. "This is also the only way to create a high-quality and distinct product," she said.

The fabled bean-to-bar approach embraced by Hsu and his peers the world over sees them roast, winnow and grind cacao beans rather than choosing mass-produced offerings. Hsu has taken this one step further since 2017 by opting for the tree-to-bar approach. It features a longer processing period, starting with the purchase of cacao pods from farmers, after which beans are

fermented—a crucial stage significantly affecting the quality of the end products.

“Fu Wan outshines many of its foreign competitors as the farm-to-factory distance is short,” Li said. All of the cacao growers are located within 30 kilometers of the company, making it easy for Hsu to visit with farmers to share ideas and cast a close eye over the crops.

The use of locally grown cacao adds to Fu Wan’s prestige as it echoes the global trend for greener production processes. “It takes less than an hour to transport freshly picked pods to Fu Wan, whereas shipping raw materials from the farm to the factory elsewhere in the world could take hours and even longer,” Hsu said.

Rich Abundance

Blessed with a tropical climate, Pingtung is home to more than 80 percent of land under cacao cultivation in Taiwan, around 300 hectares in total. Most of these farms had been planted with betel nut trees until the 2000s when the local government started encouraging growers to part ways with an agricultural crop linked to serious health issues such as oral cancer.

The production shift to cacao, a gradual one requiring many years for the trees to take root and prove economically viable, has brought hope to Lin Li-ping (林莉苹). Faced with diminishing betel nut returns, she took the plunge five years ago and climbed aboard the cacao bandwagon at her 1-hectare farm in



- 01. Fu Wan Resort draws the curtain back on different aspects of chocolate-making.
- 02 & 03. Jade Li, formerly a Fu Wan chocolatier, is winner of gold at ICA's 2019 Asia-Pacific competition for her pineapple and pepper dark chocolate.
- 04. Li's "Bonbon Chocolate" is a celebrated Chinese-language book on chocolate.
- 05. Fu Wan's Taipei 101 flagship outlet
- 06. Chocolate lovers visit the Fu Wan Resort store.
- 07. Fermented beans play a crucial role in the production of top-notch chocolates.

02 – 04. Courtesy of Jade Li
 07. Courtesy of Fu Wan Chocolate



Pingtung's Wanluan Township. With advice and plenty of moral support from Hsu, Lin keeps improving her beans and is today the proud owner of around 600 trees, making her one of Fu Wan's major suppliers.

"Fu Wan's success is an inspiration for cacao-cultivators in Taiwan," Lin said. "Existing farmers will continue to produce the crop, and those yet to get a piece of the action will soon follow suit."

Fu Wan's story is also spurring other chocolate outfits to greater heights. Last September, the brand shifted up a gear and received a big boost with the opening of a flagship store in iconic Taipei 101, formerly the world's tallest building. Li, with one eye on Hsu and his steady climb, is burning the midnight oil to lift up her fledgling brand Jade Li Chocolatier (JLC). Based in Pingtung, JLC garnered seven medals at ICA's Asia-Pacific preliminaries over the past three years under her stewardship. She is also the author of "Bonbon Chocolate" published in 2019 and considered one



of the most comprehensive books in Chinese on chocolate-making.

Grassroots Support

According to Li, the support of Pingtung County Government (PCG) is instrumental in ensuring Taiwan's nascent chocolate industry remains on a sound footing. In 2015, PCG began cultivating human resources by organizing courses on growing cacao and producing chocolate. As a beneficiary of this tutelage, Li applauds the expanded focus to collaborating with more than 30 local brands on marketing strategies over the past two years.

Another example is PCG staging the initial contest for honoring farmers growing the best cacao beans in Pingtung. In 2018, a 22-member panel of judges from Taiwan and around the world were invited to assess 31 teams of local farmers. The winners are expected to be lauded in trade publications at home and abroad, much to the undoubted delight of residents.

Hsu and Li are just the tip of the iceberg when it comes to the country's confectionery par excellence. ICA Chairman Martin Christy summed it up best when presenting Hsu with the plain/origin dark bar chocolate award in 2019 at the finals. "Watch out. Taiwan chocolate is on a roll."  

