Young International Scientists Say

China-Myanmar Partnership Advances Agricultural Innovation

INNOVATION U&I

By LIANG Yilian

Mango, a tropical fruit rich in nutrients, has a vital position in Myanmar's agriculture. Myanmar researcher Nann Miky Moh Moh worked with Chinese scientists at Zhejiang University in east China on genetically improving the flavor and variety of the fruit.

Although the regulatory roles of microRNAs (miRNAs) and long non-coding RNAs (lncRNAs) have been widely studied in many plants, mango research in this field remained unexplored. "This is the first study to provide information on non-coding RNAs (ncRNAs) of mango," Moh Moh told *Science and Technology Daily*.

During her time at Zhejiang University, she worked with Professor Chen Ming's bioinformatics research group at the College of Life Sciences. Their research aimed to identify the genetic factors affecting mango flavor and heat resistance.

"For mango flavor development, some major genes play a role in its resistance mechanisms," Chen said. "We studied the processes related to temperature regulation and identified the specific genes or targets involved."

Using advanced computational tools and through experiments, Moh Moh identified over 100 miRNAs and more than 60 cold-responsive lncRNAs interact with key gene family in Mango. These discoveries have provided new insights into genetic mechanisms that could inform breeding strategies for improving mango varieties.

"The results of our research could potentially be integrated with local institutions to transform genetic findings into improved mango cultivars," Chen said.

A journey of discovery

For Moh Moh, conducting research in China has been a transformative experience. Driven by a deep interest in biological systems, she initially pursued biotechnology, later switching to bioinformatics due to its potential to analyze large datasets using advanced computational tools.

"As Myanmar researchers, we often have ideas but lack the facilities to pursue them fully," Moh Moh explained. In contrast, China's cutting-edge research infrastructure and collaborative opportunities attracted her.

She joined Zhejiang University through a program funded by the Ministry of Science and Technology of China, working with a high-level research team. "Zhejiang University is one of China's leading institutions, highly regarded globally. Its strong reputation in life sciences made it my top choice," she said.

Her dedication did not go noticed by her team. "She's serious and devoted to research," Chen said.

Before arriving in China, Moh Moh had conducted molecular analysis on mangoes but lacked expertise in computational analysis using advanced bioinformatics tools. At Zhejiang University, she started learning advanced bioinformatics techniques and tools from scratch and worked closely with her team to bridge the knowledge gap.

"Whenever I think about my time at Zhejiang University, I feel happy," she said. "The lab members were kind, talented and hardworking. They inspired me both professionally and personally."

Strengthening Myanmar-China collaboration

Currently working in a private company in Thailand, Moh Moh remembers her time at Zhejiang University fondly and hopes to return to China for further research. "Living and working in China broadened my understanding of Chinese culture, history and philosophy," she said.

China has significantly increased investments in research, development and renewable energy, fostering international collaborations. Myanmar and China share a long-standing "pauk-phaw" (fraternal) friendship, which will celebrate its 75th anniversary in 2025.

In recent years, the two nations have deepened cooperation in science, technology and innovation. In December 2023, China's Ministry of Commerce and the Mekong River nations, including Myanmar, adopted the Five-Year Development Plan for Cross-Border Economic Cooperation (2023 — 2027). The plan includes a framework for collaboration in science, technology and innovation across the Mekong-Lancang region.

In November 2023, China and Myanmar signed a memorandum of understanding to enhance cooperative technology and innovation initiatives.

A future rooted in science

China also plans to implement the Lancang-Mekong Space Cooperation Plan, which includes launching the "Fudan-1 Lancang-Mekong Future Star" project and establishing the Lancang-Mekong youth astronomical science research center. These initiatives will strengthen scientific collaboration and innovation in the region.

As China and Myanmar continue to identify priorities for joint research, the success of projects like Moh Moh's mango study highlights the transformative power of international cooperation. By leveraging advanced technology and fostering cross-border partnerships, Myanmar's mango industry — and its broader agricultural sector — could see significant advancements in the years to come.

This column is written in cooperation with the China Science and Technology Exchange Center (CSTEC).

Myanmar researcher Nann Miky Moh Moh works in a lab. (COURTESY PHOTO)

Qinghai's Smart Computing Powered by Green Energy

By ZHONG Jianli, DU Peng, ZHANG Yun

At the Qinghai clean energy and green computing scheduling center in Xining city, real-time data on the screen monitors power generation from different sources, including wind, solar and hydroelectric power, as well as the energy consumption metrics of computing centers.

Leveraging its unique geographical advantages, Xining, capital of Qinghai province in northwest China, is promoting the synergy between green electricity and intelligent computing.

In recent years, the rapid development of generative AI has led to a meteoric rise in applications utilizing large AI models, resulting in an explosive demand for computing power.

As of June 2024, China had more than 8.3 million operational computing racks, with a computing capacity reaching 246 EFLOPS. This substantial increase in computing capacity has been accompanied by a significant rise in energy consumption. According to the China Academy of Information and Communications Technology, data centers, including computing centers, accounted for about 1.6 percent of the total electricity consumption in China in 2023.

Qinghai province, situated on the Qinghai-Xizang Plateau, has natural conditions and resource advantages that make it a leader in clean energy and an ideal location for developing green computing.

Fan Kewei, general manager of the Qinghai clean energy and green computing scheduling center, explained that computing power usage is closely tied to specific application scenarios. Compared to traditional data storage and general computing, the rapidly growing intelligent computing power is more suitable for integration with green electricity.

"Intelligent computing is not always active. Tasks like large-scale rendering and data training are typically initiated only when needed, and can be done when there is an abundance of renewable energy and lower electricity prices," Fan said.

Currently, Qinghai's intelligent computing capacity has reached 1.23 EFLOPS, and the province has established the nation's first 100 percent clean energy traceable big data center. Furthermore, its large data centers maintain an average power usage effectiveness (PUE) below 1.2, placing them at the forefront nationally.

Digitalization and intelligence are critical in the construction of a new power system, with ample computing power poised to provide essential support.

The features of randomness, intermittency and volatility associated with renewable energy make balancing electricity supply and demand increasingly complex as more renewable sources connect to the grid. AI applications, represented by large models, can perform computational analysis on meteorological conditions, historical renewable energy generation data, and electricity demand, facilitating accurate predictions of renewable energy generation and consumption, thereby enhancing the safety and stability of the power system.

Using big data, cloud computing and blockchain technologies, the province also developed the electricity-carbon calculation model to achieve a comprehensive view of carbon emissions in key industries, parks and enterprises, helping to realize the goal of carbon reduction and green development.

The Qinghai Photovoltaic and Thermal Energy Innovation Base in Delingha city, Haixi prefecture. (PHOTO: VCG)

New Law Milestone for Energy Sector

By LONG Yun

China has taken a significant step toward modernizing its energy governance with the recent approval of its first comprehensive energy law, which will come into effect on Jan 1, 2025. "The law is a milestone in the legal development of China's energy sector. It marks another step forward in modernizing the energy governance system and enhancing governance capabilities," said an official from the National Energy Administration during a recent press briefing.

This legislation addresses the long-standing need for a fundamental and unified energy law in China. It establishes a comprehensive framework for energy development, utilization, technology innovation and green transformation, paving the way for sustainable energy practices.

Establishing a green and low-carbon energy framework

A key feature of the energy law is its focus on promoting green and low-carbon energy transformation. It sets legally binding targets for non-fossil energy consumption, aiming for non-fossil energy to account for around 25 percent of total energy consumption by 2030 and over 80 percent by 2060.

The law also prioritizes renewable energy development. It establishes mechanisms like the mandatory consumption of renewable energy and the renewable energy green power certificate system.

These measures are expected to boost the credibility of green certificates and encourage wider green energy consumption across society. In addition, the law promotes mechanisms to facilitate sustainable energy practices. By laying out policies that prioritize renewable energy and support the broader adoption of clean energy technologies, the energy law solidifies China's commitment to leading the global shift toward sustainability.

Advancing energy technology and innovation

The law dedicates a section to energy technology innovation, underlining the importance of technological advancement in achieving energy modernization. It institutionalizes proven strategies, such as leveraging major energy projects for technological breakthroughs, to accelerate the conversion of scientific achievements into practical applications. It also defines priority areas for innovation, including renewable energy, hydrogen energy, nuclear power and energy storage technologies.

Moreover, it emphasizes strengthening policy, platform and talent support to encourage enterprises to become innovation hubs.

This approach aims to enhance China's energy innovation capabilities and drive the development of cutting-edge energy technologies, ensuring that innovation remains at the forefront of the country's energy transformation.

Evolution of Trusted Data Matrixes

By WANG Jing

An action plan for the development of trusted data matrixes (TDM) was recently issued by the National Data Administration (NDA).

China is expected to establish more than 100 TDMs by 2028, making breakthroughs in TDM operation, technology, ecology, standards and security systems, and significantly improving the level of data openness, circulation and use in various fields, according to the plan.

As a new data circulation and utilization infrastructure, TDM aims to achieve the sharing and common use of data and resources, which is also an important carrier needed to construct the national integrated data market.

The plan consists of three key tasks. The first is to implement TDM capacity building, by building trusted management capabilities, improving resource interaction capabilities, and strengthening value co-creation capabilities.

The second is to cultivate and promote TDM, including the construction and promotion of five types of TDM for enterprises, industries, cities, individuals and cross-border.

The third is to strengthen foundation-setting actions of TDM, focusing on formulating key standards, tackling core technologies, improving basic services, and expanding international cooperation.

The country will support leading enterprises in building enterprise TDM, cooperate with upstream and downstream enterprises to share high-quality data resources, and improve process efficiency.

It will also tackle key technologies for TDM, by promoting the integrated application of data interoperability technologies, and exploring the integration and innovation of large models and TDM.

Moreover, the plan proposed to actively expand international cooperation and participate in the formulation of relevant international standards.

HarmonyOS to Redefine Mobile Operating Systems

As Huawei's executive director Richard Yu said, ecosystem development was the "final battle" for HarmonyOS.

Huawei invested over six billion RMB annually to support developers and partnered with educational institutions to train future talent.

By 2023, over 675,000 developers had joined Huawei's Developer Alliance, and the company had established collaborations with more than 300 universities. This effort bore fruit: leading Chinese apps like WeChat, JD.com, and Xiaohongshu launched Harmony-native versions, while universities like Wuhan University introduced HarmonyOS-focused programming courses, laying a solid foundation for future innovation.

Leading the IoT revolution

By providing a unified platform for smartphones, wearables, industrial machinery and more, HarmonyOS aims to spearhead the transition to a fully integrated Internet of Things (IoT) ecosystem. Its modular design and distributed architecture significantly reduce development costs and increase operational flexibility, making it a preferred choice for both developers and consumers.

The system's versatility is evident in its applications across industries.

For instance, Huawei has partnered with leading hospitals to enhance wearable health monitoring, using HarmonyOS to detect cardiac irregularities with high precision. Similarly, its applications in AI, AR/VR and automotive systems signal a promising future in emerging technologies.

By late 2024, HarmonyOS had over 1.5 billion devices and a market share of 17 percent. Its rapid growth underscores its potential to redefine global technology dynamics.

But for Huawei, the journey of HarmonyOS is far from over. With its commitment to innovation, ecosystem development, and talent cultivation, the company is well-positioned to shape the future of smart connectivity.

In the words of a HarmonyOS developer: "The road is difficult, but victory is within sight."