

CHINA

Technological achievements finding success

Enterprises founded by CAS carrying out Five-Year Plan to prioritize innovation

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The scientific and technological enterprises incubated and founded by the Chinese Academy of Sciences have helped accelerate the commercialization of scientific achievements and brought significant socioeconomic benefits to the people and the country.

The CAS has committed to exploring new ways to transfer and commercialize scientific results and has encouraged research teams to establish high-tech startup companies in an effort to make enterprises the main driver of technological innovation across the country.

The new 14th Five-Year Plan (2021-25) proposal unveiled in late October again put innovation at the heart of China's future plan, emphasizing scientific and technological self-reliance and stressing that science and technology development should be economy-oriented and meet the needs of the people and the country.

The new blueprint, proposed at the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China that concluded in late October, said the country will need to strengthen the dominant position of enterprises in innovation, promote in-depth integration of production, education and research and support enterprises to take the lead in forming innovation consortia and undertaking major national scientific and technological projects.

It stressed the key role of entrepreneurs in innovation, encouraged enterprises to increase R&D investment and supported small and medium-sized enterprises' efforts to become birthplaces of innovation.

China will also need to strengthen intellectual property protection and greatly improve the commercialization of scientific achievement, according to the blueprint.

In 2016, the CAS launched a special initiative to promote the transfer and commercialization of scientific and technological achievements. In 2018, four subsidiaries were shortlisted among the top 10 academic institutes that reached the highest contract amount in licensing and investment, according to the annual report of China's scientific and technological achievements commercialization in 2019.

The Institute of Microelectronics, for example, has encouraged researchers to join or start their own businesses in a bid to make enterprises the primary driver of technological innovation. By June, the institute has engaged 158 enterprises either by transferring scientific results or making investments. Most companies incubated by the institute have grown rapidly and garnered operation revenue of more than 9 billion yuan (\$1.3 billion) in 2019, according to Cao Liqiang, deputy director of the institute.

To meet the major needs in the semiconductor industry, the institute has launched, invested and established projects and companies

to boost integrated circuit technologies since 2012. It has set up two key laboratories engaged in cutting-edge basic research and 13 R&D centers for product development and application. For example, the National Center for Advanced Packaging, established in 2012 in Wuxi, Jiangsu province, has become a leading center in offering solutions to advanced semiconductor packaging and testing, according to Cao.

Some enterprises incubated by the institute have also aimed to have a positive socioeconomic impact on the public.

One company called Wayzim, founded in 2016 in Wuxi, has now grown into one of the world's leading companies in producing intelligent logistics equipment with independent R&D and production.

Its founder and chairman, Li Gongyan, also a former researcher at the microelectronics institute, said it was the CAS that granted him the first batch of venture capital that allowed him to conduct four years of basic research on some of the technologies that were key to developing intelligent equipment before establishing the company.

The equipment, which looks like a gigantic, overhead conveyor belt, now excels in its high precision bar code recognition and control system. When a worker puts a parcel on the belt, a bar code reader will automatically register its information into a database, sort the parcel according to its destination and transport it to the designated bag for delivery.

The advanced control system can also make sure each parcel is being placed at the right position and make the "jump" into the bag at the correct pass. The system's speed can reach up to 9 kilometers per hour, and the company has already realized a technology that can allow the equipment to read the bar code from all six sides, greatly relieving manual labor.

China is the world's largest express delivery market, and the parcel volume keeps increasing by more than 30 percent each year, according to Li, adding that it would be quite challenging for manual laborers to sort through hundreds of millions of parcels a day.

Before 2016, China's major delivery companies had struggled with problems related to a glut of parcels in warehouses — especially after Nov 11, the day of China's online shopping spree. But now with better equipment in place, such problems seldom occur.

Wayzim's equipment now covers about 40 to 45 percent of the delivery market across the country and is also exported overseas.

"Express e-commerce is a booming industry in China. We will soon be dealing with 100 million parcels a day," Li said.

"China's e-commerce is leading the world, and the efficiency and cost-control of our express delivery are also leading the world. It is all thanks to the support of technology such as big data, artificial intelligence and cloud computing, as well as our automation equipment," he added.

Reflecting China's image



A visitor looks at award-winning photographs at an exhibition in Galaxy Guofeng Art, a gallery in Shenzhen, Guangdong province, on Sunday. Featuring more than 100 pieces participating in the fourth China Image Competition, the exhibition reflects China's endeavors to build a moderately prosperous society in all aspects. MAO SIQIAN / XINHUA

Forest rangers thriving in southern Xinjiang

By WANG XIAOYU in Beijing
and MAO WEIHUA in Urumqi

Marrying forest protection efforts with its poverty relief drive has yielded positive outcomes in the Xinjiang Uygur autonomous region, which recently announced that it had removed all of its remaining counties from the country's poverty list.

In the past four years, more than 44,300 poor residents in Xinjiang have been hired and trained as forest rangers to patrol the region's diverse landscape of forests, wetlands, grasslands and deserts, according to the local government.

"Each ranger will receive an annual subsidy of 10,000 yuan (\$1,520). It is estimated that these welfare positions have helped a total of 88,000 people shake off poverty," said Zhang Jianjiang, an official at Xinjiang's forestry and grassland bureau.

According to Zhang, nearly 90 percent of subsidized forest rangers live in deeply impoverished areas in the southern part of the region, one of six nationwide deemed as the hardest nuts to crack in the country's poverty elimination campaigns.

The last 10 poverty-stricken counties in Xinjiang, involving about 165,000 poor residents, are all located in the south. They were delisted from a national registry of poor areas on Nov 14, marking a milestone in the region's poverty reduction campaigns.

Tursun Tohot, from Hotan prefecture's Moyu county, said he has bid



Forest rangers make grass grids to fight desertification on the northern edge of the Taklimakan Desert in Yuli county, Xinjiang Uygur autonomous region, last year. PROVIDED TO CHINA DAILY

farewell to his old days of idling and feels relieved and proud to have gotten a steady job as a forest ranger.

"I have specific tasks assigned by administrators each day, and I never stroll around aimlessly," he said while scanning the forests for signs of a fire hazard in early November.

"There is a set of standards to fulfill our duties as guardians of the forests," he added.

The hometown of Tursun, as well as a large number of residents previously trapped in poverty in Xinjiang, is located on the edge of the Taklimakan Desert. The area's precarious ecology — threatened by severe desertification and wind erosion — is believed to have exac-

erbed the plight of local people.

But in recent years, the natural environment has significantly improved there, and the quality of locally-grown fruit is also increasing, according to Zhang.

"The role of forest rangers in making this progress possible is indispensable," he said. "They have broadened their horizons and mastered essential skills through training."

Taxgul Amar, from Wensu county in Aksu prefecture, was employed to patrol desert poplar forests in 2019.

"I did not know these trees play a significant role in preserving the environment until I was trained as a forest ranger. The job has not only helped me shed poverty, but has also

deepened my affection for the forests," she said.

Forest rangers like Taxgul are in charge of about 713,000 hectares of forests, 154,000 hectares of wetlands, 152,000 hectares of desertification land and 6.36 million hectares of grasslands in southern Xinjiang, official data shows.

In order to diversify the income of villagers, the scope of training programs for forest rangers in Xinjiang has expanded to include guidance on fostering suitable agricultural businesses, such as the planting of marigolds and walnuts.

Ayhat Nur, from Aksu's Wushi county, said he has been able to sharpen his skills in marigold cultivation thanks to training offered by forestry and grassland officials and local enterprises.

"In addition to income from patrolling the forests, I am also managing plots of marigold fields in Wushi," he said. "I have learned how to trim branches from professionals. I can earn much more with my own hands."

With the goal of stripping away all poverty labels in Xinjiang having been reached, forest rangers scattered in different corners are bound to receive more targeted training on the cultivation of forest fruits, prevention and control of pests and development of forest fruit industry parks, the local government said.

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Cage fisheries bow out for sake of environment

By WANG XIAOYU in Beijing
By YANG JUN in Guiyang

Fisherman Fan Fangzhuo said raising and harvesting fish in net cages drifting in natural waters was lucrative but had always nudged his conscience.

Like hundreds of thousands of fishermen in Guizhou province, Fan had utilized such buoyant apparatuses to scale up fishery production and income in the Qingshui River in his hometown of Jinping county.

"We flocked to buy and install net cages in waterways in the past. My net cages used to cover more than 60,000 square meters of waterway," he said. "I earned a lot but also felt like I had committed a crime against the environment."

Cage aquaculture was detrimental to the Guizhou water ecosystem because unregulated installation of net grids congested waterways and led to a phenomenon called eutrophication, which occurs when excess nutrients from residues of fish feed and excrement cause algae to bloom and block out sunlight below the water's surface.

Veteran tour boat driver Luo Qian in Xingyi city's Wanfeng Lake can still recall how painful it was to navigate through a thicket of net cages submerged in turbid waters.

"They were everywhere on the river surface. I had to be extremely

careful to avoid bumping into them," he said. "Many tourists had arrived with high hopes of seeing Guizhou's picturesque landscape but ended up feeling disappointed," he said.

The issue prompted local authorities to dismantle net cages as early as 2016. About a year later, the provincial government accelerated efforts to eliminate cage aquaculture in all natural waters across Guizhou.

Also in 2017, Guizhou became one of the three provinces shortlisted by China's central government as pilot zones for ecological conservation. Guizhou, along with Fujian and Jiangxi provinces, are tasked with exploring comprehensive and effective ways to improve natural environments while creating new engines for green development.

Officials in Guizhou said the livelihoods of fishermen such as Fan, who had to abandon their main source of income, and the restoration of the pristine river ecosystem in lakes are equally important.

Jiang Kai, an official at Xingyi's Nanpanjiang township, said: "The core issue was that most net cages were placed in the water by fishermen. For them, taking them down means no income."

To buffer the impact on fishermen's lives, Jiang said, people affected received 20 yuan (\$3) for each square meter of net cages being torn down. In 2018, a State-owned com-

"I hope water pollution will never occur again and that the lake can be as beautiful as it is now forever."

Luo Qian, tour boat driver in Wanfeng Lake in Guizhou province

pany was established to handle the fish in any remaining nets.

Meanwhile, excess labor from the fishery industry was diverted into new sectors that local authorities had encouraged to supplement the local economy, such as tourism and regulated in-land fisheries.

These efforts eventually paid off. Better incomes, higher business incentives and a visibly improved local environment attracted more people who used to make a living with net cages to change their ways. By the end of 2018, such fisheries in Nanpanjiang became part of history.

Across Guizhou, about 2,240 hectares of waters once used for cage aquaculture had been recovered as of September, and nearly 1.8 billion yuan in subsidies were committed to the campaign, the

provincial government said.

The effect on water quality has been significant. From January to June, about 98 percent of the water in Guizhou was deemed in good condition, an increase of 3.3 percentage points from the same period in 2017.

Luo, the boat driver, compared sailing on the Wanfeng now to zipping through a highway.

"The lake is very clean now, and it's a delight to drive around," he said. "I hope water pollution will never occur again and that the lake can be as beautiful as it is now forever."

Offshore, uprooting cage aquaculture also served as a catalyst for local residents to seek opportunities in environment-friendly industries.

Fan, in Jinping county, was one of the first villagers to decide to pivot to factory fish farms. He had received 2 million yuan in subsidies for his expansive net grids, which helped him to rent a larger plant. Last year, total sales of his new business reached more than 600,000 yuan.

Fan has also started a breeding cooperative that enlisted 54 impoverished households in the county.

"The environment here is getting better and better, and villagers have started different careers," he said. "It's a win-win situation for both ecology and economy."

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Little riders



Kindergartners race on bicycles without pedals during a game in Huichang, Jiangxi province, on Sunday. Such bicycles have become a tool for Chinese parents to develop their children's flexibility and motor skills. WU XIHUI / FOR CHINA DAILY