

FOCUS

2

Sci-tech Role in Protection of Cultural Heritage Strengthened

By CHEN Chunyou

China released its plan to strengthen the protection of historical and cultural heritage during the 14th Five-Year Plan period on November 8.

According to the plan, the protection system will cover ancient buildings, historical sites, natural landscapes,



An exhibition of ancient books restoration achievements. (PHOTO: VOG)

cultural settings and intangible cultural heritage.

In order to enhance the role of sci-tech innovation in cultural heritage protection, some important measures will be taken, which include attaching importance to cultivating talent in heritage institutions.

The application of modern science

and technology in archaeology will be strengthened, says the plan. The study of cultural relics, including isotope analysis, trace element analysis, DNA research and organic residue analysis, will also be enhanced.

Digital archaeology will be accelerated to serve the collection, management, analysis and application of archaeological information. Warehouses for archaeological specimens in key national areas will be built, according to the plan.

In addition, digital and information-based technology will be employed to promote high-precision restoration of the scattered overseas cultural relics, such as the Dunhuang posthumous writings.

Wu Yuanbin, director general of the department of science and technology for social development of the Ministry of Science and Technology, said that China will continue to strengthen basic research and interdisciplinary studies in the next five years.

The research of the technological application in cultural heritage protection will be arranged in key national labs. Comprehensive experimental plat-

forms for scientific research will be built by relying on the National Scientific and Technological Innovation Center of Cultural Heritage and the Nanhai base of National Center for Archaeology, National Cultural Heritage Administration, said Wu.

Nowadays, China is home to 36 national archaeological parks, among which 11 are UNESCO World Heritage sites. The country aims to build no less than 15 such parks during the 14th Five-Year Plan period, said Lu Qiong, the director general of department of policies and regulations of National Cultural Heritage Administration.

According to the plan, a structure-optimized system of cultural heritage protection with distinctive features and multiple functions will be preliminarily established in China by 2025.

By 2035, China will put in place a cultural relics protection and management system commensurate with the goal of developing the country into a cultural power, and the development of sci-tech innovation personnel will provide strong support for the protection, research and utilization of cultural relics.



A cotton picker works in fields in Yuli County, Xinjiang. (PHOTO: XINHUA)

Xinjiang: Building Innovation Engine at the Heart of Silk Road

By LI Linxu

Xinjiang, located in the core area of the Silk Road Economic Belt, is striving to be an engine of innovation in science and technology.

By 2025, it will make significant achievements in the building of a regional sci-tech innovation highland, according to a plan recently released by the government of Xinjiang Uygur Autonomous Region.

The document, titled the *14th Five-year Plan for Xinjiang Uygur Autonomous Region's Science and Technology Innovation*, lays out a detailed roadmap for its next phase of work.

In the next five years, the region's sci-tech strength will get a big boost, and its innovation capabilities will get a great lift, according to the plan.

To achieve these goals, the government budget for research and development (R&D) activities will be increased, and enterprise's investment on R&D are encouraged.

During 2021-2025, the R&D expenditure of the whole society will grow by more than seven percent annually, among which the proportion of basic research expenditure will account for no less than 10 percent of the total.

According to the plan, the full time equivalent of R&D personnel per 10,000 employees will increase to 11.73.

To create a favorable ecological en-

vironment for innovation and entrepreneurship, Xinjiang is doing its utmost to improve its sci-tech infrastructure and service system.

It will focus on ten special advantage industries, such as power industry, textile and clothing industry, and strategic emerging industries, such as the digital economy, new energy and new materials.

Aiming to build a regional innovation engine, the plan highlights the leading role of the Urumqi-Changji-Shihezi national innovation demonstration zone and the Silk Road Economic Belt innovation-driven development pilot zone.

The plan also proposes to form a regional innovation pattern featuring opening-up and cooperation.

Xinjiang neighbors with Gansu, Qinghai and Xizang, and borders eight countries including Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Pakistan, Mongolia, India and Afghanistan.

To make the most of its unique location advantages, it will expand the space for opening-up and cooperation under the Belt and Road Initiative, and actively integrate into domestic and international innovation networks.

Sci-tech innovation will inject strong impetus into the region's high-quality development, and lay a solid foundation for a beautiful, healthy and safe Xinjiang, says the plan.

Modern Technology Makes Excavated Artifacts Preserved

Edited by BI Weizi

The archaeological excavations at Sanxingdui in Sichuan province have unearthed a huge number of "national treasure" relics, including the most complete gold mask and a massive bronze statue.

These artifacts, which have been "sleeping" underground for thousands of years, are located in a closed underground space where oxygen is consumed in the long-term metabolic activities of oxygen-consuming bacteria. They are often covered with moist soil under low temperature in order to be preserved for a long time.

However, changes in temperature, humidity, carbon dioxide, and other environmental factors after excavation put these artifacts at risk of being ru-

ined. Therefore, the control of environment during excavation and the protection of artifacts afterwards become especially crucial.

Integrated air-conditioning system to give heritage "sense of security"

At the entrance of the third and fourth pits at the excavation site, an intelligent air-conditioning system provides a suitable environment for the excavation of cultural relics.

The system, which connects the original soil, air and light parameters in the excavation compartment through sensors to the intelligent air cloud platform, helps archaeologists master the air changes at all times, truly making the air "visible".

Moreover, through AI algorithms, instructions can be automatically given to the excavation site air conditioner to

achieve automatic adjustment of the site environment, ensuring that the environmental parameters are within the safe range at all times and protecting the excavation quality of cultural relics.

More than thirty kinds of functional segments are freely combined with multi-stage filtration to meet the requirements of air purification and sterilization of the excavation compartment.

Heritage display cabinet with hi-tech for the protection of cultural relics

Due to air, light and microbial changes, newly-excavated ivory and other organic materials in this archaeological excavation site have to deal with the challenge of discoloration, mouldering and powdering.

In order to solve this problem in the archaeological community, a made-

in-China heritage display cabinet was introduced.

Through a combination use of new technologies, such as intelligent storage and management system, the cabinet is able to fulfill dual responsibilities of displaying and storing cultural relics simultaneously.

In terms of the storage environment of cultural relics, through the "constant temperature and humidity" technology, more than 90 percent humidity on average can be maintained, thus eliminating the cracking caused by temperature changes.

A new generation of archaeologists is starting again with a new generation of excavation techniques, and these modern technologies are also escorting the products of ancient civilization.

China Supports Female Scientists to Make a Difference

By ZHONG Jianli

Wang Yaping, China's first female astronaut to conduct a spacewalk, has become a global headline grabber and she is part of the drive seeing more women entering the world of sci-tech.

"The world needs science, and science needs women. We see that female scientists have achieved outstanding results in many fields such as physics, medicine, and mathematics. They are using science to change the world," said Wang Hongyang, director of the National Center for Liver Cancer and president of the China Women's Association for Science and Technology, during the 3rd World Science and Technology Development Forum held on November 7 in Beijing.

Female sci-tech talent are an impor-

tant part of the whole sci-tech community and play an essential role in China's scientific and technological development. In recent years, the number of female sci-tech experts has expanded rapidly. They have made great contributions in basic research, applied technology, and engineering practice, which fully demonstrated their ability.

According to statistics from the China Association for Science and Technology, women currently account for 40 percent of China's human resources in science and technology, and the figure is even more than 50 percent in the Internet and biomedicine fields.

To create a better environment for women to work in the field of science and technology, the country has made great efforts.

This April, seven departments in-

cluding the Ministry of Science and Technology (MOST) and the All-China Women's Federation (ACWF), initiated an action to encourage women to contribute more to sci-tech innovation.

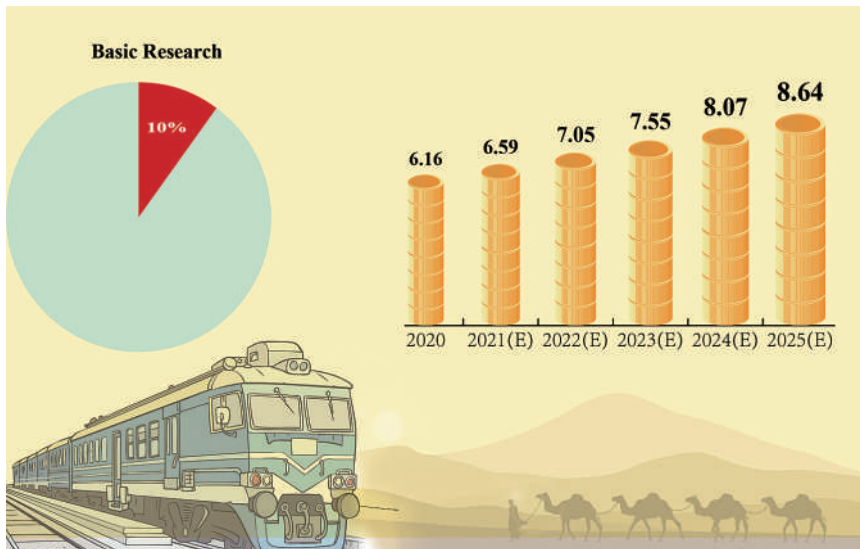
In July, MOST, ACWF as well as 11 other departments, jointly launched a series of measures to support female sci-tech talent in playing a greater role in sci-tech innovation.

These measures include supporting female sci-tech talent in participating in the sci-tech decision-making process and international cooperation, developing their innovation and entrepreneurship capabilities, improving evaluation mechanisms for their jobs, and supporting their research during maternity.

In 2020, four women won the Nobel Prize for their pioneering contribu-

tions in the fields of chemistry, physics and literature. Though women around the world have demonstrated their creativity and influence in sci-tech development, "We still have to call on the whole society to give more attention, support and respect to female experts, create more platforms and opportunities, and give them more resources and trust," said Wang Zhizhen, academician of the Chinese Academy of Sciences, adding that female scientists should also be confident and self-reliant.

As a female researcher in the field of life sciences, Wang also encouraged female scientists, with their unique generosity and empathy, to overcome the barriers of language, tradition, nationality, and politics, and to promote international scientific and technological exchanges and cooperation.



In 2020, Xinjiang's R&D expenditure reached 6.16 billion RMB and is expected to grow by more than seven percent annually. (Graphic Design: Li Linxu)

China-U.S. Declaration on Climate Action

From page 1

The two sides intend to cooperate on:

- regulatory frameworks and environmental standards
- maximizing the societal benefits of the clean energy transition
- policies to encourage decarbonization and electrification
- key areas related to the circular economy
- deployment and application of technology

Recognizing the significant role that emissions of methane (a potent greenhouse gas) play in increasing temperatures, both countries intend to de-

velop additional measures to enhance methane emission control before COP27 in 2022.

To help reduce CO₂ emissions, China will cut down coal consumption during the 15th Five Year Plan (2026-2030). The two countries agreed to cooperate on distributed generation policies that boost integration of solar energy, storage, and other clean power solutions to electricity users.

"The Working Group on Enhancing Climate Action in the 2020s," which will meet regularly to address the climate crisis and advance the multilateral process in this decade, will also be established.

Hualong One Drives China's Nuclear Energy Surge

From page 1

The Hualong One is the result of CNNC and CGNPC merging their design, as suggested by the Chinese National Energy Administration. The design incorporates the latest safety systems following internationally accepted standards, including backup passive safety systems, SA mitigation systems and enhanced seismic protection.

With all core components manufactured in China, the country is now the

fourth to develop indigenous third-generation nuclear power technology after the U.S., France and Russia.

Green future

On January 30 this year, CNNC announced the start of commercial operations for Unit 5 of Fuqing Nuclear Power Plant, the first project to use Hualong One.

China's second nuclear power unit with a Hualong One reactor began to fill with fuel on November 6, a major

step to putting the reactor into operation. Currently, a total of eight Hualong One units are under construction or have been delivered around the world.

Once operational, the power generated by a Hualong One unit will reduce consumption of nearly 3.12 million tons of standard coal and offset 8.16 million tons of carbon dioxide emissions per year.

Each unit with a Hualong One reac-

tor has the capacity to produce approximately 10 billion kWh of power per year. This is equivalent to the annual electricity demand of one million people in a moderately developed country, according to CNNC.

CNNC chairman Yu Jianfeng said that the corporation will accelerate the construction of Hualong One reactors to help achieve carbon neutrality, and promote the new technology to overseas market.