



# Science and Technology Daily

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## Tech for Better Life in China

### The Miraculous Ecological Tale of Henan

By LIN Yuchen & WANG Xiaolong

Visit the Zhengzhou Longhu Park in Henan's capital city Zhengzhou and you will be greeted by majestic swans and other wildlife. It is difficult to believe that this place used to be a wasteland once.

Henan's commitment to a greener urban environment can be seen from its multiple initiatives that combine environmental protection with economical benefits.

The ecological protection drives in this inland central province in the Yellow River valley are tackling alleviating extreme climate conditions and poverty in its suburban cities while building up foundations for their economic growth.

The Zhengzhou Longhu Park at the heart of Zhengzhou is a striking example. The size of nearly two dozen soccer fields, it is the largest artificial wetland in Zhengzhou with natural water ecosystem protection and restoration functions. Once a barren wasteland, it was transformed in merely 10 years into a haven for nearly 150 species of wildlife such as mute swans, egrets, ducks and mandarin ducks.

There are 55 mute swans in the park. Lu Bing, a volunteer with an association for bird protection in Zhengzhou, says the species is very choosy about its habitat but the Longhu Park has been meticulously protected and greened to meet its needs.

The conservation model in the wetland park involves both the government and volunteers. The Zhengzhou municipal government, working with local animal protection experts, has planted vegetation suitable for the consumption of the mute swans in the park. "This not only creates a scenic attraction for visitors, beautifying the natural environment but also ensures ample food for these swans to thrive on," Lu said.

Besides, the park's water and air quality is monitored regularly in real-time while portable noise monitoring devices are used to periodically assess the noise levels.

Another highlight of Henan's environmental protection drive is the national-level wetland park in Yuzhou, a county in Xuchang City, which showcases an innovative model of treating polluted water.

A management personnel of the wetland said wetlands constructed adjacent to a sewage plant could naturally purify wastewater. *See page 2*



Visitors pose for photos in front of China's pavilion at the Green Zone of the 28th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28), in Dubai, the United Arab Emirates, December 3, 2023. (PHOTO: XINHUA)

## Editor's Pick

### Yangtze River Delta Leads Innovative Development

By Staff Reporters

The Yangtze River Delta, encompassing Shanghai and the provinces of Jiangsu, Zhejiang and Anhui, covering around 358,000 square kilometers, generates nearly a quarter of China's GDP and contributes to over one-third of the country's total foreign trade.

On a crucial inspection tour, Chinese President Xi Jinping stressed efforts to make new major breakthroughs in the integrated development of the Yangtze River Delta and enhance the region's leading and exemplary role in pursuing Chinese modernization.

Xi particularly stressed the need for Shanghai to accelerate the construction of the "five centers" - the international center of economy, finance, trade, shipping, and science and technology innovation.

#### Rich sci-tech innovation resources

Shanghai has consistently showcased unique advantages in sci-tech innovation, boasting the largest talent pool in China over the past three years, as re-

vealed in the Shanghai Talent Supply and Demand Data Report. Despite challenges posed by the COVID-19 pandemic, Shanghai maintained its leading position, with a talent proportion of 10.2 percent in 2022 — surpassing other Chinese big cities like Beijing (9.18 percent) and Shenzhen (6.43 percent).

Beijing and Shanghai rank as the top two with the highest number of high-level scientists among 20 major cities known for their sci-tech innovation worldwide, according to a report released at the 15th Pujiang Innovation Forum in 2022.

In addition, Shanghai consistently rates as one of the top cities when it comes to attracting foreign experts. Throughout the decade, more top scientists moved to Shanghai from key cities in developed countries than left it, according to Yicai Global.

#### Striving to build global sci-tech innovation center

Shanghai, the largest city in China known for its vibrancy, openness and in-

novation, has taken center stage since China implemented the policy of reform and opening up. Shanghai's exemplary role as a major economic powerhouse leading China towards high-quality development is underscored again in the new era.

Based on the resources, Shanghai is dedicated to becoming a sci-tech innovation hub, contributing to breakthroughs in science and technology development in the Yangtze River Delta.

According to the World Intellectual Property Organization's latest Global Innovation Index released in September, the Shanghai-Suzhou sci-tech cluster moved up one place to enter the top 5 on the list of top 100 sci-tech clusters, and two other Chinese sci-tech clusters, Shenzhen-Hong Kong-Guangzhou and Beijing, also made the top five.

Chinese cities are rapidly growing in high-quality scientific research while American and European cities are dropping, according to a global ranking of top science cities by scientific database Nature Index released this November. *See page 2*

### World's Deepest, Largest Underground Lab Begins Operation

By WANG Xiaoxia

Some 2.4 km below the earth's surface, the world's deepest and largest physics facility was completed and put into use on December 7.

The Deep Underground and Ultra-low Radiation Background Facility for Frontier Physics Experiments (DURF) is the second phase of the China Jinping Underground Laboratory, which is tucked inside the Jinping Mountain in Sichuan province, southwest China.

The site is ideal for its low cosmic-ray muon flux — only one-hundred-millionth of that on the earth's surface, which means the facility has far less noise from background radiation than

many other underground facilities.

The DURF is mainly designed for major basic research in physics, and carries out experiments in frontier fields, such as direct detection of dark matter, neutrinoless double beta decay, as well as key nuclide synthesis processes and stellar evolution in the field of nuclear astrophysics. Therefore, it will provide a platform for interdisciplinary research integrating particle physics, nuclear astrophysics and life sciences.

The China Jinping Underground Laboratory consists of two phases. Its first phase was completed and began operation at the end of 2010. With a total volume of about 4000 cubic meters, it housed two experiments to directly de-

tect dark matter: the China Dark Matter Experiment (CDEX) and PandaX.

The completion of the second phase, namely the DURF, has enlarged the lab's total room capacity by nearly 80 times to 330,000 cubic meters. Ten research teams from Chinese universities and research institutions, such as Tsinghua University, China Institute of Atomic Energy and Shanghai Jiao Tong University, have been stationed in the DURF to carry out scientific experiments.

The DURF was jointly built by Tsinghua University and Yalong River Hydropower Development Company. It is the first time that a large state-owned enterprise supported national basic scientific research.

## International Cooperation

### Green Technology Brings Freshwater to UAE

By Staff Reporters

Through cooperation with the Belt and Road Initiative (BRI), China has shared its technology and experience in seawater desalination with partners in arid regions around the world, providing abundant freshwater to local households.

One flagship project is the Taweelah Independent Water Plant (IWP) in Abu Dhabi, UAE. Contracted by Power China in 2019 and connected to the grid at the end of 2021, it is the world's largest operational membrane-driven desalination plant.

Applying the world's advanced reverse osmosis (RO) technology, the plant has an unprecedented capacity of 909,000 m<sup>3</sup> per day, and can meet the water demand of nearly one million local households under full load, according to Power China.

The UAE faces high water stress due to its hot weather and large demand, with an average daily water consumption per capita of over seven cubic meters. The UAE's fresh water supply mainly relies on groundwater and desalination. However, long-term large-scale exploitation of groundwater will seriously degrade the water quality and cause salinization, posing a threat to the local agricultural and ecological environment. Thus, the seawater desalination plant is an important facility for social welfare.

Apart from providing freshwater, the seawater RO plant features a 50MW on-site solar PV power generation facility to complement the energy supply from the grid. The PV power plant is expected to meet 30 percent of the plant's electricity demand in the first eight years, with a target of increasing solar energy's share to 55 percent by the end of the first quarter-life of the project.

At the 2023 Global Water Summit, the Taweelah IWP won the Global Water Awards—Desalination Plant of the Year 2023, for its contribution to people's livelihoods and local economic and social development in the UAE.

## New Graphic

### THE NUMBER OF CHINA'S SCI-TECH JOURNALS CONTINUES TO GROW

- The total number of sci-tech journals
- English-language sci-tech journals



Source: Blue Book on China's Scientific Journal Development (2023)  
Designed by SONG Ziyun / S&T Daily

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