

Multifaceted Approach to Sci-tech Growth

Dialogue

By LONG Yun & ZHONG Jianli

Since the 18th National Congress of the Communist Party of China in 2012, China has undergone a remarkable transformation, most notable by its openness to the world and unprecedented growth in the sci-tech field. Many foreign experts working in China have witnessed and actively contributed to this transformation.

Among them is Professor Francesco Faiola, an Italian researcher who is the first full-time foreign scientist at the Research Center for Eco-Environmental Sciences of the Chinese Academy of Sciences (CAS). Recently, Faiola shared his insights with *Science and Technology Daily* about China's development and its implications for the world.

Collaboration promoted by openness

The past decade has seen steady progress in implementing the vision of a global community of a shared future for mankind.

China has established many initiatives and programs to encourage international sci-tech collaboration. For example, the Belt and Road Initiative (BRI) for International Cooperation in Science and Technology aims to enhance scientific research partnerships with the BRI partner countries, focusing on areas such as agriculture, health, and engineering.

Meanwhile, many international sci-tech collaborative projects between foreign universities and Chinese institu-

tions result in long-term partnerships, providing stability and continuity for research results.

"Working in an internationally collaborative environment in China has been incredibly rewarding," said Faiola, adding that international researchers benefit from state-of-the-art laboratories and equipment that may not be readily available in their home countries.

According to Faiola, China's rapid progress in science and technology is the result of a multifaceted approach that includes robust government support, a focus on education and talent development, international collaboration and effective commercialization of research. These factors collectively create a conducive environment for sustained innovation and technological advancement.

Modernization focusing on quality of life

China's rapid technological advancements have not only transformed its national strength but also significantly enhanced the daily lives of its people. Foreign observers often marvel at the new energy vehicles on the roads, an extensive high-speed rail network connecting cities and even remote areas, and the convenience of mobile payment services available virtually everywhere.

"China understands that advancements in science and technology are crucial to achieving global growth as a nation," which is "particularly evident in its emphasis placed on applied sciences in recent years." Faiola emphasized that in the field of digital economy, China has witnessed exponential growth. Mobile technology has revolutionized daily

life, which enables people's access to a wide range of services.

Healthcare has seen remarkable advancements as well. Online healthcare platforms offer telemedicine services, bridging the gap between urban hospitals and remote areas.

Determination to address global challenges

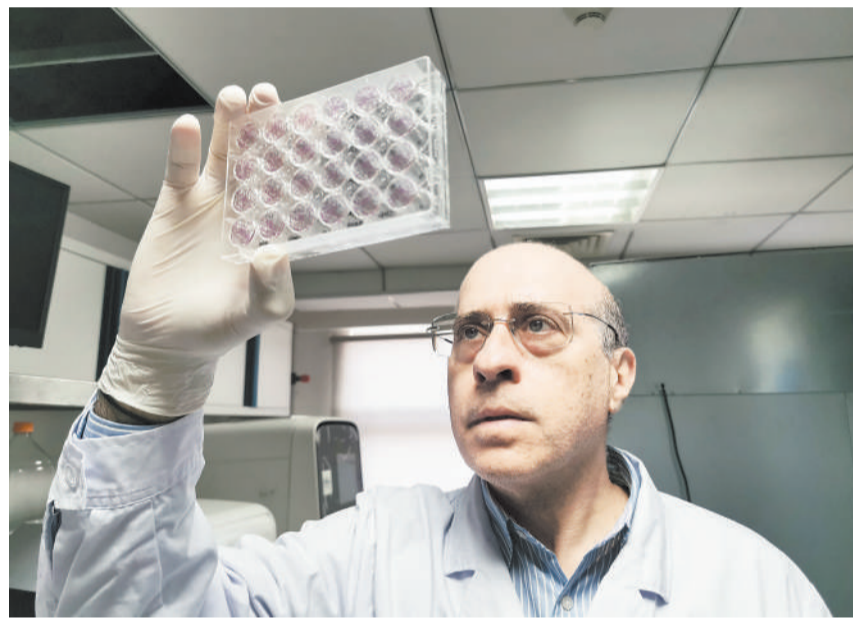
China has emerged as a pivotal player in tackling global challenges like climate change and public health, through its steadfast commitment to innovation.

Faiola, an advocate for sustainable development, lauded China's proactive stance in implementing stringent environmental measures and ambitious dual carbon goals. "China's leading role in combating climate changes extends beyond policy goals to concrete actions,"

he added.

He especially mentioned the development of projects like the Tengger Desert Solar Park and advancements in wind turbine technology. According to this Italian scientist, these showcase China's capability to scale renewable energy solutions, reducing greenhouse gas emissions and fostering a sustainable energy transition.

Furthermore, recognizing the health impact of pollution, China has allocated substantial resources to improve air and water quality, which directly contributes to enhancing public health outcomes. Faiola pointed out that China's efforts in healthcare infrastructure and technology have not only bolstered domestic healthcare capabilities, but also positioned China as a leader in responding to global health challenges.



Professor Francesco Faiola. (COURTESY PHOTO)

Green China

Greetings from Green China

By LONG Yun, BI Weizi, CHEN Chunyou & ZHONG Jianli

For over a decade, China has made impressive strides in ecological and environmental protection, a fact often applauded by foreign experts living and working in the country. Some of them have seen the effective policies driving sustainable development and participated in helping develop China's green industries, while others have witnessed the country's committed efforts to promote international biodiversity. *Science and Technology Daily (SET Daily)* caught up with some of them to get their thoughts on China's green wave of success.

Defender of biodiversity

China released the *Biodiversity Conservation Strategy and Action Plan (2023-2030)* in January 2024, and is now drafting a plan to implement major biodiversity conservation projects. Meanwhile, China is actively deepening international cooperation and contributing to global biodiversity governance.

"I think China has shown that it's taken leadership in this role through the Kunming-Montreal meetings. It's always been a firm supporter of the United Nations Convention on Biological Diversity," said Irish scientist Kyle Warwick Tomlinson, principal investigator of the Community Ecology and Conservation Group at the Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences (CAS).

Official data shows that 90 percent of terrestrial ecosystem types and 74 percent of key protected wildlife species populations were under protection in China nationwide.

Spanish scientist Ahimsa Campos-Arceiz, principal investigator of the Megafauna Ecology and Conservation Group of XTBG, CAS, said, "China plays a role internationally, such as the Belt and Road Initiative, in helping the development of infrastructure in some other countries. I think this could be used not only for development but also for conservation."

Campos-Arceiz noted that in Xishuangbanna, a border area with Myanmar and Laos, there is collaboration with those countries for joint monitoring and protection. "It's an excellent example of transboundary cooperation," he said.

Starting in 2015, China has launched 10 pilot national parks to protect its natural environment and biodiversity. In December 2022, China took another green step forward by planning to create the world's largest national park system by 2035.

"More recently, China started undertaking this ambitious project to form national parks across China. This project is very important because national parks are large areas that are crucial for conserving biodiversity, as they maintain whole ecosystem processes," said Tomlinson, adding that, "China has made impressive gains in ecological protection over the last 10 years."

Practitioner of sustainable development

Ecological civilization is a concept promoted for balanced and sustainable development that features harmonious coexistence between humans and nature.

This concept has encouraged many Chinese cities to pursue green development, and high-quality and sustainable growth.

The concept is applauded by South African scientist Michael Meadows, professor in the School of Geography and Ocean Sciences at the Nanjing University in east China's Jiangsu province. He told *SET Daily* that he is "personally very impressed with what the Chinese government has achieved at the policy level."

Meanwhile, American writer and traveler Brian Linden, who came to China in 1984, has seen firsthand the country's transition towards a better quality of life since 2000. "The air quality has improved dramatically. I never imagined that we could see such changes within 10 years," he said. "China has achieved a wonderful balance between economic development and environmental protection. The world should be appreciative of China's efforts."

The Shan-Shui Initiative, translated as the "mountains and rivers" initiative, has restored over 100 million mu (about 6.7 million hectares) of land since its implementation in 2016. This has helped China contribute a quarter of the world's new forest area since the beginning of this century and becoming the first country in the world to achieve zero net land degradation.

Linden said that initiatives such as these demonstrate China's commitment to improving the environment. "I hope the world understands that China has made dramatic per capita improvements for a population of 1.4 billion people," he added.

Promoter of green industries

The green upgrading of traditional industries is advancing worldwide, and China is spearheading the development of green industries through practical initiatives and innovations.

One example is a pioneering project farming land-based Atlantic salmon from eggs, which was established in Xiangshan, a county in Zhejiang's Ningbo city. Since this April, locally farmed Atlantic salmon has appeared on the shelves of restaurants and supermarkets across the Yangtze River Delta.

"We are very grateful for the support we have received from the local government in creating this [salmon farming initiative] and making it happen," said Norwegian fishery expert Andreas Thorud, managing director of the project's Nordic Aqua Ningbo company.

The natural conditions required for farming Atlantic salmon are extremely stringent, but the ecological environment and geographical location of Xiangshan are perfectly suited for this project. Like Norway, Ningbo has vast sea areas, a great environment, and a rich tradition of aquaculture.

In 2023, China launched the Belt and Road Blue Cooperation Initiative, promoting the development of marine renewable energy, seawater desalination, sustainable fisheries, and other industries to ensure the sustainable use of marine resources benefits all.

"I think this could also be beneficial for the government's target of modernizing aquaculture and providing a healthy, tasty protein source," said Thorud.

FAQs About China's Port Visas

Service Info

Q: Are China's port visas the same as "visa on arrival"? Which ports are authorized to issue port visas?

A: China's port visas are similar to the "visa on arrival" arrangement of some countries. It is a "way" or "method" of applying for a visa, rather than a specific type of visa like a "business visa" or "tourist visa". However, every country has its own conditions and procedures in accordance with its laws con-

trolling the issuance of its port visas.

According to Chinese laws and regulations, foreign nationals holding ordinary passports who urgently need to enter China but do not have enough time to apply for a visa at the Chinese embassies or consulates abroad can apply for port visas for entry. They can submit their applications in advance to the port visa authorities by themselves or through the parties inviting them to China, or apply on site upon arrival at the specific ports in China.

To facilitate the application and avert a situation where the applicant is unable to obtain approval for entry due to legal reasons such as being legally ineligible for a visa or entry upon arrival at ports, which may affect travel arrangements and increase financial costs and time, foreign nationals are recommended to submit their applications in advance to the port visa authorities.

ties of the intended destinations, obtain preliminary approval from them, and then go to the corresponding port for applying for visas. For foreign tourist groups applying for port visas, the Chinese travel agencies responsible should apply for them in advance at the port visa authorities.

Q: What are the documents required to apply for a port visa in China?

A: A valid passport or any other international travel document, along with relevant supporting documents that prove the urgent reason(s) for his/her entry into China. Once the visa is issued, he/she may enter China from the port where the visa application is made.

As for the supporting documents, for example, a foreigner entering China for urgent business activities should submit the inviting party's invitation letter explaining the business purposes, details of emergency, and main itinerary arrangements, as well as relevant proof of the emergency. For more information, please contact the port visa authority at the intended port of entry.

Q: What types of visas can be extended, renewed, and re-issued for foreign nationals in China in their vicinity?

A: Foreign nationals coming to

China for short-term non-diplomatic and non-official activities such as business cooperation, visit and exchange, investment and entrepreneurship, visiting relatives, tourism, or private matters, etc., with legitimate reasons to extend their stays may submit applications to the nearest exit-entry administrations of the public security organs in the places where they stay for the extension, renewal, and re-issuance of their business visas (M visas), visit visas (F visas), short-term private affair visas (S2 visas), and short-term family visit visas (Q2 visas), as well as for the extension and re-issuance of their tourist visas (L visas).

Q: How to apply for group tourist port visas?

A: For foreign tourist groups consisting of two or more people applying for group tourist port visas, the Chinese travel agency responsible for organizing and receiving such groups must submit invitation letters, lists of personnel, and tourist reception plans to the relevant port visa authorities in advance. Such tourist groups can enter and exit from all open ports in China.

Source: National Immigration Administration



Foreign tourists visit the Great Wall in Beijing on June 7, 2024. (PHOTO: VCG)

Is AI Gobbling Up the World's Electricity?

Science Outreach

By CHEN Jie & BI Weizi

At a time when society stands in awe of the rapid advances in AI, the environmental footprint of these advances is often overlooked. However, the significant environmental impacts of AI development demand attention and action.

AI and energy consumption

Liu Yanjia, an engineer at the Insti-

tute of Computing Technology of the Chinese Academy of Sciences, told *Science and Technology Daily* that the electricity consumption of AI is mainly concerned with two key phases: the training and the inference phase.

In the training phase, models learn and evolve by digesting large amounts of data. Generally speaking, the greater the number of parameters, the more computational power is consumed by large models, and consequently, the more electrical energy they consume. Taking the GPT-3 model as an example, its total energy consumption for training is about 1.28 ter-

awatt-hours. This amount is comparable to the monthly electricity usage of 6,400 Chinese households.

Once trained, the models enter the inference phase, where they're applied to solve real-world problems. "As AI models gain traction in various sectors, the need for inference and its electricity consumption will increase," said Liu.

At present, the application scope of AI is becoming more and more extensive, and its "exploitation" of the global power system will be further highlighted.

How to mitigate AI power usage?

"The most direct solution is to start from the supply side and continuously

increase the power supply to solve the problem of AI power consumption," said Liu, adding that more progress should be made in wind power, photovoltaics and energy storage technologies.

In addition, there are energy-saving potentials on the demand side, including algorithm optimization, hardware improvement and energy management. Algorithm optimization can reduce computation and energy consumption without significantly reducing AI performance.

Liu also suggested that new computing technologies, such as quantum computing and photonic computing, can also greatly improve computing efficiency and reduce energy consumption in the long term.



▲ The landscape of Honghe Hani Rice Terraces in Southwest China's Yunnan province. (PHOTO: XINHUA)

▼ For more information, please scan the QR code below.

