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BIODIVERSITY CONSERVATION enables a beautiful China with vitality

生物多样性保护：美丽中国生机盎然

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Wu Hequan: Standards digitalization is the trend of the times

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A beautiful China with flourishing biodiversity

Biodiversity and ecosystems feature prominently in many of the Sustainable Development Goals (SDGs) and associated targets, as they contribute to economic activities and human well-being. The Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets adopted under the *Convention on Biological Diversity* have established the global framework for priority actions on biodiversity. Conserving biodiversity is to protect human beings, as the diversified, healthy ecosystems underpin all lives on the earth and allow us to carry out economic and social activities.

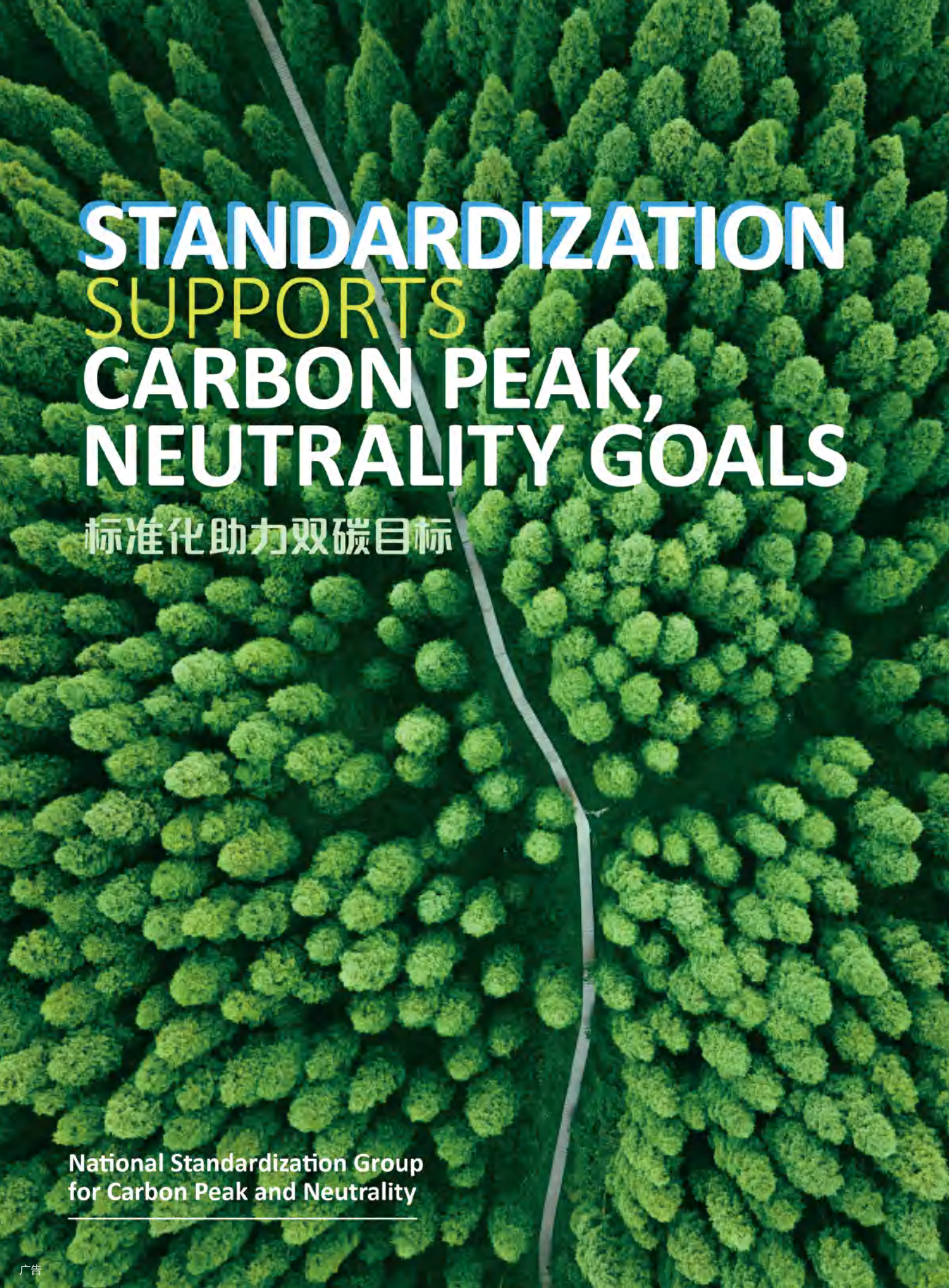
The May/June issue presents a series of articles showcasing the endeavors of China to improve biodiversity and ecosystems and how standards play a vital role in this process. Through conservation of giant pandas and their habitats in the past few decades, the number of pandas in the wild has increased from 1,114 to 1,864, which also contributes to the surging flora and fauna in these areas.

In the EXCLUSIVE INTERVIEW column, two renowned standardization experts, Wu Hequan, Academician of the Chinese Academy of Engineering, and Yu Xinli, President of China Association for Standardization, shared their insights into standards digitalization and suggestions for future work.

Standards digitalization is an irresistible trend in the standardization development, which creates golden opportunities for innovation, boosts the reform of standardization methods and management system, but brings unprecedented challenges, said Wu Hequan.

The Two Sessions, the annual meetings of China's major political bodies, the Chinese People's Political Consultative Conference (CPPCC) and the National People's Congress (NPC), were convened in Beijing in early March. The SPOTLIGHT column presents the development goals of this year and the views on key topics, such as carbon peak and neutrality, elderly care, artificial intelligence and big data, and how standards facilitate the development in these areas.

With the increasing awareness of biodiversity, supporting strategies and action plans, we believe that China will make greater contributions to global biodiversity governance and the SDGs!


STANDARDIZATION
SUPPORTS
CARBON PEAK,
NEUTRALITY GOALS
标准化助力双碳目标
National Standardization Group
for Carbon Peak and Neutrality

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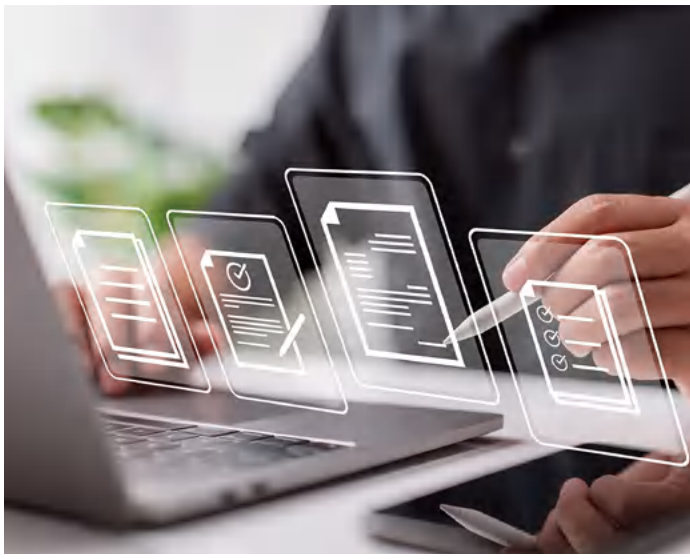


HEADLINE |

SAC publishes the Guidelines on the Standardization Work for Implementing China's Regional Major Strategies

The Standardization Administration of China (SAC) recently published the Guidelines on the Standardization Work for Implementing China's Regional Major Strategies, which will promote the implementation of the Outline for National Standardization Development.

China has adopted the overall approach to a modernized country. Therefore, when it comes to demands for standards, we can not ignore the difference between regions. The Guidelines is developed to serve the implementation of major regional strategies, aiming to incorporate standards demands of regional development into the national standards system, make the regional plan of standardization development, and harmonize technical regulations of different regions. Eight key points are listed in the Guidelines.

The Guidelines specifies the orientation of regional standardization work. It should fit vital regional strategies, including the coordinated development of the Beijing-Tianjin-Hebei Region, the development of the Yangtze River Economic Belt, the Guangdong-Hong Kong-Macao Greater Bay Area and the Yangtze River Delta, ecological conservation and high-quality development of the Yellow River Basin, etc. Apart from achieving economic growth, we should also attach great importance to fundamental construction, ecological environment, industrial innovation, and public services, which will contribute to benign interactions of elements within regions.

The Guidelines points out that we should focus on the development, implementation and assessment of standards for regional strategies. Also, we should let international standardization organizations, private enterprises, research institutes and relevant associations play roles in this process.

Further work will be assigned to boost standardization development. We will cultivate relevant talents, advocate investment, strengthen the assessment of work plans and goals, enhance policy support for regional standardization, and officially include standardization work into the annual work plans of local standardization departments.

SAMR and SAC publish national standard for well-facilitated farmland construction

China is known for its long history of agriculture. In the new era, agriculture is not only a fundamental industry that feeds people, but also a pioneer field to apply new technologies and realize ecological conservation.

The State Administration for Market Regulation (SAMR) and SAC have recently published the revised national standard GB/T 30600-2022, *Well-facilitated farmland construction - General rules*. As the first revision of this voluntary national standard since 2014, the standard makes up many deficiencies in the previous edition, responding to latest demands for scientific and standardized management of farms.

Well-facilitated farmlands are symbols of modern agriculture, which are well-equipped, high-yielding, eco-friendly, intensive and of strong disaster resistance. The standard emphasizes building the well-facilitated farmlands, including agricultural mechanization, intensive farming and agricultural industrialization. By upholding the principles of "scientific allocation, different policies, target orientation, good farms for planting grains, ecological conservation, focusing on quality", the standard is developed to comprehensively enhance the quality of farms, serving as a vital method to implement the Outline for National Standardization Development.

The most remarkable feature of the standard is setting up different construction norms based on regional characteristics, which defines how many crops a certain farm can produce separately. According to the standard, 1.2 billion mu (80 million hectares) of well-facilitated farms will be constructed by 2030, which will steadily produce 650 million metric tons grains per year, together with current ones. They can not only meet people's basic food demands, but also contribute to a more secure China.

Mandatory national standard for electronic cigarette released

Electronic cigarettes become more and more popular due to its convenience and faint smell of smoke. Initially, electronic cigarettes serve as a substitute for cigarette, as they are believed to reduce passive smoking. However, with dazzling flavors, electronic cigarettes turn out to lure non-smokers, especially young people or even teenagers, to start smoking. To regulate this product, the Standardization Administration of China (SAC) officially published the mandatory national standard for electronic cigarette on April 8.

GB 41700-2022, *Electronic cigarette*, defines a white list of 101 additives, which is thoroughly assessed and confirmed by experiments. The standard redefines a electronic cigarette as a electronic conveyor system that generates aerosol for smoking. In this case, those nicotine-free electronic cigarettes must obey the requirements of GB 41700-2022. The standard stipulates that selling nicotine-free electronic cigarettes is prohibited on the market and only tobacco flavor is permitted to be sold, which is aimed at protecting juveniles from being attracted by sweet-flavored and nicotine-free electronic cigarettes.

Furthermore, GB 41700-2022 stipulates several security requirements on electronic cigarettes, including childproof and leakage-proof design of both cartridges and cigarette sets, and explosion proof in case of falling. Cartridges and cigarette sets should be sealed to avoid refilling. Also, if electronic cigarettes fall off, fire or explosion should not be allowed.

The standard will officially take effect on October 1, giving producers time to adjust their products.

First national standard for coral reef restoration

The oceans breed uncountable lives, including giants like blue whales, and tiny creatures like plankton. Various lives make up diversiform marine ecosystems, which all help to keep the stabilization of global ecology, or in other words, of human being's lives.

With a long and winding coastline, China has been working on marine ecosystem conservation and restoration. China's first national standard for marine ecosystem restoration technology, GB/T 41339.2-2022, *Technical guideline for marine ecological restoration-Part 2: Coral reef restoration*, was published on April 1.

Coral reef ecosystem has the highest level of biodiversity among all marine ecosystems. Therefore, protecting coral reef ecosystem has great significance for marine ecology conservation, marine fishery, the development of tourism, coast conservation, maritime homeland security, etc. Unfortunately, coral reefs have shown obvious degeneration all over the world.

The South China Sea Institute of Oceanology of Chinese Academy of Sciences (CAS) points out that one of the most urgent demands of marine conservation in China is to accelerate the recovery of coral reef ecosystem. The institute leads the development of GB/T 41339.2-2022, which fills the gap in this area and offers technical support to improve marine ecology.

Based on the current situation, the standard defines the procedures, contents, methods and technologies of coral reef restoration, and makes clear relevant indexes, locations, cautions, etc. Also, it highlights the preparation work including surveys, design & argument of restoration programs, as well as follow-up management and preservation. The efficiency of restoring coral reefs is expected to be improved after the standard takes effect on October 1.

Sectoral standard for image and video stabilization of mobile devices released

Nowadays, people are heavily relying on smart phones for daily activities. When we purchase smart phones, we often care about the cameras, considering if they can take good-looking selfies and record our lives.

Producers of mobile phones are fiercely competing in this lane by inventing various cameras with diversified functions. To better regulate these products, the Ministry of Industry and Information Technology of China (MIIT) published YD/T 4066-2022, *Technical requirements and testing methods for image and video stabilization of mobile devices*, on April 24.

The standard is a joint achievement of China Academy of Information and Communications, AP Photonics Co., Ltd. and smart phone producers including Huawei, OPPO, vivo, SAMSUNG, etc. The sectoral standard applies to global smart phones and other mobile devices sold in China. It specifically applies to products equipped with Optical Image Stabilization (OIS), Electronic Image Stabilization (EIS), comprehensive image stabilization and other technologies.

With the development of 5G technology, the phone inner space becomes extremely crowded, as the number of inner antennas and cameras inside the phone increase. Also, significant disturbance from antennas greatly affect camera modules. Thanks to the development of OIS technology, this problem is solved.

According to Hong Hangqing, CEO of AP Photonics, OIS and fast autofocus technology can greatly improve image quality and release AI software from excessive burden. Moreover, Chinese enterprises have been leading the development of liquid lens technology, which enables consumers to have better experience using variable macro lenses and telephoto lenses.

First association standard for reducing carbon emission of road freight released

Logistics lays the foundation of modern economy, and road freight is an essential part of logistics. Given that people are seeking solutions to global warming, cutting down carbon emissions of road freight can be something we can embark on.

Transportation industry accounts for 12% of China's annual greenhouse gas emission, with road freight taking a great share of over 48% of carbon emissions. When it comes to road freight, it often comes up with a huge problem: empty-loaded rate. Freight trucks often run without cargoes before loading and after unloading, which is an inevitable waste of resources. Moreover, renewable resources are not sophisticated enough for medium-sized and heavy lorries, which means we must find methods to reduce carbon emissions of road freight. Therefore, if we keep this waste to the minimum, the rewards would be great.

To solve this dilemma, T/CSTE 0024-2022, *Technical specification on assessment of greenhouse gas emission reductions for intelligent road freight matching system*, was published by the Chinese Society of Technology Economics, an organization committed to combining technology and economy. With support from the China Classification Society, the technical specification is initiated by Full Truck Alliance, who established a smart logistics platform to realize car-to-cargo matching. Based on big data technology, the platform helps allocate orders and notably reduces the empty-loaded rate. Also, the specification offers a method to calculate carbon emission reduction of the platform. In 2021, thousands of drivers have reduced 14 grams of carbon emission per ton-kilometer on average by using the platform.

The technical specification is expected to make road freight cleaner and more efficient.

HIGHLIGHTS |

MOU on standardization signed between SAMR and MEIC

A MOU on standardization and supervision over product quality and safety was signed between the State Administration for Market Regulation (SAMR) of China and the Ministry of Economy, Industry and Commerce (MEIC) of Costa Rica on April 7, 2022.

The MOU was signed by Tang Heng, Chinese Ambassador to Costa Rica, on behalf of SAMR and Victoria Hernández, Minister of MEIC, based on the previous bilateral communication.

The MOU will help the two parties to further deepen the international cooperation on standards, enhance the mutual coordination and support in activities of international standards organizations including ISO and IEC, and jointly establish the Standard Information Platform Contributed by the Belt and Road Countries.

The two parties will also promote the exchanges and cooperation in the supervision over product quality and safety, and improve the level of product quality and safety in bilateral trade, so as to better facilitate the economic and trade exchanges and advance the relationship between the two countries.

Keeping good bilateral communication and cooperation in market regulation, the two parties both participate in the international standardization activities as members of ISO. During the ISO Council meeting held in Costa Rica in June 2019, the Chinese delegation, led by Tian Shihong, Vice-Minister of SAMR and Administrator of SAC, and the Costa Rica's counterpart reached a consensus on signing an agreement to strengthen the cooperation on standardization and supervision over product quality and safety.

China-Germany standardization cooperation promoted

The China-Germany Working Group on Standardization Strategic Cooperation held a virtual meeting on March 16, 2022, which was attended by Tian Shihong, Vice-Minister of SAMR and Administrator of SAC, Christoph Winterhalter, Chairman of the Executive Board of DIN, Michael Teigeler, Managing Director of DKE as well as Deniela Bronstrup, Director General for Digital and Innovation Policy at the German Federal Ministry for Economic Affairs and Climate Action (BMWK).

During the meeting, the two parties made in-depth discussions on key topics including ISO Strategy 2030, all-electric society proposed by IEC and *An EU Strategy on Standardization*, and exchanged their work experience in the areas such as product safety and standardization.

Tian put forward that the ISO's standardization roadmap should be promoted together with the enhanced management of technical committees. The role of Standardization Management Board and Market Strategy Board should be fully exerted and the standardization research on all-electric society should be strengthened in IEC.

He stressed that the two parties need to jointly facilitate the consensus on digital cooperation of standards to be included in the smart standards work of ISO and IEC, and further strengthen the exchange and communication in areas such as standardization strategy and standards life-circle management, which was highly affirmed by the German party.

The two parties reached a consensus on achieving more practical results through the China-Germany standardization cooperation.

HIGHLIGHTS |

First intl technical specification for nucleic acid amplification methods published

ISO/TS 5798:2022, *In vitro diagnostic test systems—Requirements and recommendations for detection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by nucleic acid amplification methods*, was published by ISO on April 19.

After years of combating with the global pandemic, nucleic acid amplification has become a vital and acute method to detect the coronavirus and infected cases. The technical specification is the first of its kind on nucleic acid examination of SARS-CoV-2. Supported by the State Administration for Market Regulation (SAMR) and the Standardization Administration of China (SAC), it is proposed by China National Institute of Standardization (CNIS), BGI Genomics and other relevant organizations.

ISO/TS 5798:2022, developed by ISO/TC 212, *Clinical laboratory testing and in vitro diagnostic test systems*, has taken the least time of development since the technical committee was established in 1994.

It is a joint achievement of global experts from China, the U.S., Germany, Japan, Canada, the UK, etc. The project is jointly led by Yin Ye, CEO of BGI Genomics, Yun Zhenyu, Director of Food and Agriculture Sub-Institute of CNIS, Professor Hayato Miyachi from Japan, Professor Bob Rennie from Canada and Zhang Zhiying from BGI Genomics.

The document caters to the characteristics of the coronavirus and demands of amplification. By establishing a sound quality system of nucleic acid amplification, it will help medical laboratories, producers, research institutes all over the world and all human to win the long war against the virus.

The 58th meeting of APEC expert group on energy efficiency & conservation

The 58th meeting of the APEC Expert Group on Energy Efficiency and Conservation (EGEEC) was held virtually by the Resource and Environment Sub-Institute of CNIS from March 30 to April 1.

More than 40 participants attended the meeting, consisting of experts from APEC economies and representatives from international organizations such as Asia-Pacific Energy Research Center (APERC) and APEC Sustainable Energy Center (APSEC).

The meeting focused on the cooperation of APEC economies in the field of energy efficiency and conservation. Attendees shared their progresses in relevant technologies, policies and standards, and discussed key issues including digitization, energy efficiency and progress in energy intensity reduction. Declared in the 19th APEC Leaders' Meeting in 2011, the goal is to realize a 45% decrease of the energy intensity in the APEC region, taking the number in 2005 as the baseline.

Experts reached an agreement on enhancing the cooperation in technologies of energy efficiency and conservation and increasing the communication with international organizations and other expert groups specialized in the analysis of APEC energy data, new energy resources, renewable energy resources, etc. Further effort will be put into tracking the descending trend of energy intensity, promoting cooperation to combine energy efficiency enhancement with relevant technologies, and managing to meet the goal of energy intensity decrease.

Subordinated to APEC's Energy Working Group (EWG), EGEEC offers technical suggestions on the cooperation between APEC economies. CNIS has become the counterpart of EGEEC in China since 2017, and has been elected the Vice-Chair of the working group.

Lei Xiang, Deputy Director from the International Cooperation Department of the National Energy Administration, made a closing speech on behalf of the organizer.

Two Sessions 2022 at a glance

2022年全国两会概览

The Two Sessions, the annual meetings of the National People's Congress (NPC), the top legislature, and the Chinese People's Political Consultative Conference (CPPCC), the top political advisory body, were convened in Beijing from March 4 to March 11, 2022.

As a platform for observing China's development and an embodiment of Chinese democracy, the Two Sessions review the progress of the goals previously set by the country's leaders and formally introduce the new goals for the year ahead.

The development goals of 2022 were unveiled on March 5 in the Report on the Work of the Government delivered by Chinese Premier Li Keqiang on behalf of the State Council. The report is the most important document during the Two Sessions, as it sets out a wide range of economic and development tasks in the coming year, including GDP growth.

Targets set for 2022

The fundamentals of China's economy remain unchanged, and they will maintain long-term growth. There is no doubt that our economy will withstand any new downward pressure and continue growing steadily long into the future.

The main projected targets for development this year are as follows:

GDP growth of around **5.5%**

Over **11,000,000** new urban jobs

A surveyed urban unemployment rate of no more than **5.5%**

CPI increase of around **3%**

Growth in personal income that is basically in step with economic growth

Steady increases in both the volume and quality of imports and exports

A basic equilibrium in the balance of payments

Grain output of over **650,000,000** metric tons

Further improvement in the environment

Continued reduction in the discharge of major pollutants

Energy consumption per unit of GDP to be assessed with appropriate flexibility within the framework of the 14th Five-Year Plan; and the exclusion of newly added renewable energy and coal, petroleum, and natural gas consumed as raw materials in the total amount of energy consumption.

(Source: Xinhua News Agency)

Voices about standards in the Two Sessions

两会代表、委员谈标准

Political, business and social elites across the country gathered in Beijing in early March, discussing the key topics of social concerns, such as carbon peak and neutrality, health and medical care, elderly care, artificial intelligence as well as big data. Standards serve as the foundation for ensuring the high-quality development of these areas. Let's find out their voices about standards in the Two Sessions.

On carbon peak and neutrality

Accelerating the development of standards system on carbon peak and neutrality

Shu Yinbiao
Member of the CPPCC National Committee

We should rapidly establish the system on carbon emission verification and accounting, said Shu Yinbiao, Member of the CPPCC National Committee and President of IEC.

Shu suggested conducting research on carbon emission standardization, accelerating the development of the standards system on carbon peak and neutrality, filling the gaps in key areas, and enhancing the construction of a basic database of carbon emission. He also suggested promoting the calculation method to be internationally compatible, improving the accounting standards and verification mechanism, and developing the standards on carbon footprint of low-carbon products.

In addition, he advised to strengthen our coordination with international standards, and actively participate in international standards development and revision. He put forward deeper cooperation with international counterparts, and cultivation of leading intermediate bodies for standards development and certification and testing services on carbon emission.

Optimizing the layout of green and low-carbon industries

Wang Jianming
Member of the CPPCC National Committee

"The path to realize carbon peak and neutrality is to develop green and low-carbon industries, optimize the industrial and energy structure, and improve the economic system for green, low-carbon and circular development," said Wang Jianming, Member of the CPPCC National Committee and Head of Sichuan Bureau of Geology and Mineral Resources.

To resolve the prominent problems such as lagging standards system, Wang advised to rapidly establish the standards system for green and low-carbon industries, and develop relevant standards. He also advised to support enterprises to participate in standards development at various levels and conduct the certification of green and low-carbon products.

He proposed that China need to optimize the regional layout of green and low-carbon industries, and exert the role of state-owned enterprises, driving the coordinated development of these industries.

Coordinated development of eco-friendly buildings and carbon goals

Du Xiaoguang
Deputy to the NPC

Green buildings will provide strong support for achieving the goals of carbon peak and neutrality. However, there are no complete method and standards system for carbon emission accounting in the field. Therefore, Du Xiaoguang, Deputy to the NPC and Deputy Chief Engineer of Yunnan Construction and Investment Holding Group Co., Ltd, put forward the following suggestions.

First, determine the period of carbon emission calculation, the value of carbon emission factors of energy and building materials, as well as the scope of greenhouse gas to account; develop the supporting standards on carbon emission accounting, especially in the areas of prefabricated buildings and construction projects.

Second, formulate plans and supporting policies for carbon neutrality of buildings based on the economic levels of various regions, and rapidly form an incentive and restraint mechanism for pollution and carbon reduction.

Improving the standards on carbon peak and neutrality

Hong Jie
Deputy to the NPC

Positive progress has been made in the top-level design, national carbon trading market and carbon reduction concept across the country, according to Hong Jie, Deputy to the NPC and Chairman of the Board & President of SKSHU Paint Co., Ltd.

To improve the national carbon market, Hong advised to establish a unified standard, certification and labeling system of green products, construct a unified evaluation mechanism in green, low-carbon and energy conservation areas, release new incentive measures for certified green products, promote the green supply chain for good interaction of raw materials, commodity production and consumption, as well as release standards and methods to encourage the production of green and low-carbon products.

He also advised reducing energy consumption of future buildings by more scientific structural design and more energy-saving construction materials.

Speeding up the development of green AI

Li Yanhong
Member of the CPPCC National Committee

Self-driving cars have entered a key period of application in China, facing a variety of problems, said Li Yanhong, Member of the CPPCC National Committee and Founder, Chairman of the Board and CEO of Baidu.

To address this, Li proposed several suggestions: first, support local governments to formulate relevant policies for autonomous vehicles; second, improve laws on transportation safety; third, establish the intelligent transportation infrastructure ahead of schedule, and strengthen policy support, enabling safer, greener and more efficient transportation.

He indicated that a more environment-friendly green AI will be realized by developing green hashrate to reduce the energy consumption of data centers, and developing green algorithm to raise the energy efficiency ratio of infrastructure.

He also suggested exploring the control of carbon emissions in data centers and developing standards on green algorithm measurement.

Developing the standards on battery carbon footprint

Zeng Yuqun
Member of the CPPCC National Committee

Battery plays a key role in the new energy industrial chain, which is included in the strategic plans in the United States and Europe. However, there are blanks in standards and methodologies for carbon footprint accounting of battery in China, according to Zeng Yuqun, Member of the CPPCC National Committee and Chairman of the Board of Contemporary Amperex Technology Co., Ltd.

It is important to initiate research, establish the management system on product carbon emission, participate in formulating global rules of carbon neutrality, and establish the mutual recognition mechanism with European countries, Zeng said.

To be specific, large-capacity batteries are needed in the transformation of electricity and transportation industries. With the gradual implementation of carbon policies, new-energy vehicles and the application of renewable energy are growing rapidly across the world, Zeng added.

Standards facilitate the development of green finance

Li Minbin
Member of the CPPCC National Committee

There is a consensus on stimulating more investment to facilitate green development through green finance, said Li Minbin, Member of the CPPCC National Committee and Joint Chief Executive Officer of Bank of East Asia.

Li proposed suggestions in two aspects. First, accelerate the unification of green finance standards. At the national level, the Plan on Finance Standardization in the 14th Five-year Plan period (2021-2025) specifies the improvement of green finance standards system. At the international level, national standards on green finance will be further promoted to be geared with international ones.

Second, expand the national carbon market. He advised to expand the industries and enrich the traded products in market, facilitate the innovation of derivative products, enlarge the scale of carbon trade market, and improve the risk control by financial technologies.

On health and medical care

Interaction of standardization and technological innovation in health area

Li Lin
Deputy to the NPC

Promoting the interaction of standardization and technological innovation is of great significance in the transformation of fundamental research and productivity achievements in the health area, said Li Lin, Deputy to the NPC and Head of Shanghai Institute of Nutrition and Health, Chinese Academy of Sciences.

However, the standards system supporting the research on actual health conditions is not established in China yet. Meanwhile, the pathway to standardization is not clear, and the standards on technical evaluation need further improvement.

To meet the demands of high-quality development, Li advised to establish the standards system based on actual health conditions, explore the development route of patents and standards in the health sector, and value the role of standardization achievements in diversified evaluation indicator system of technological achievements.

Specification on the quality of Chinese medicinal materials

Huang Luqi
Member of the CPPCC National Committee

It is necessary and feasible to compile the specification on the quality of Chinese medicinal materials, according to Huang Luqi, Member of the CPPCC National Committee and Vice-Administrator of National Administration of Traditional Chinese Medicine.

National research resources can be integrated by experts in related fields to compile the specification based on the varieties of Chinese medicinal materials. The specification should comply with the requirements of *Standardization Law of China* and *Drug Administration Law of China*, Huang emphasized.

Based on the practices of quality supervision, the majority of the specification is recommended to become voluntary standard, and the rest is recommended to be mandatory standard. Though it is not a standard now, the specification will have better effect through reference to related documents.

Accelerating the standardization of medical information system

Xu Ying
Member of the CPPCC National Committee

We should accelerate the standardization of medical information system, said Xu Ying, Member of the CPPCC National Committee.

At present, second-class hospitals and above across the country have basically completed building a basic information system, and most third-class hospitals have also established the information systems such as telemedicine.

Xu suggested enhancing top-level design, developing harmonized national data standards covering health records and releasing unified interface standards, so as to lay a good foundation for information sharing and interconnectivity; strengthening the safety management in various stages through modern technologies, and ensuring the accuracy and safety of patient information through biological identification technologies.

Meanwhile, he also suggested enhancing the construction of remote consultation platform and Internet-based hospital, and integrating resources to facilitate the standardization of medical information.

Adopting harmonized national standard on Chinese medicinal granula

Zhang Boli
Deputy to the NPC

Zhang Boli, Deputy to the NPC and Academician of Chinese Academy of Engineering, put forward the following suggestions to pursue the healthy development of the Chinese medicinal particle industry.

First, strengthen the national standards development and accelerating the filing work. Five hundred national standards are expected to be released within a year. Second, develop standards on raw medicinal materials and define the number of indicators on content testing. Third, abolish provincial standards development and filing to avoid redundant research and resource waste. Last, reevaluate the existing national standards to avoid safety risks and costly prices.

Zhang also suggested discussing and developing safer quality standards based on the clinical practices in the past two decades, to ensure safe and effective clinical medication.

On elderly care

Advancing the standardization of smart elderly care with big data

Yuan Yafei
Member of of the CPPCC National Committee

"I advised to promote the standardization of community home-based smart elderly care services, supporting its scaled and professional development," said Yuan Yafei, Member of of the CPPCC National Committee and Chairman of the Board of SanPower Group.

To solve existing problems, Yuan advised to enhance the standardization of smart elderly care solutions, gradually promote the related list of standards, develop standards according to the practical needs in different conditions, and guide elderly care organizations to improve professional capability.

In terms of big data, government departments need to establish unified standards, build the platform for elderly care services, integrate the cross-sector information and strictly regulate the access and use of data, Yuan added.

Improving the standards system on community home-based elderly care

Sun Wei
Deputy to the NPC

There are urgent problems on community home-based elderly care, such as imperfect national legal system and standards system, a lack of talents and unsatisfying profitability, according to Sun Wei, Deputy to the NPC and Director of Broadcasting Department, Xi'an Broadcasting and Television Station.

To meet the needs of massive seniors and achieve the high-quality development of the industry, Sun put forward several suggestions: first, enhance the top-level design, and accelerate the improvement of the rule of law and standards system on community home-based elderly care; second, optimize the supply of services, and strengthen the talent building and service quality; third, enrich the service principals, and implement policy support to attract social forces to enter the market of community home-based elderly care services.

On AI and big data

Developing the standards on AI-based teaching and learning terminals

Liu Qingfeng
Deputy to the NPC

The ongoing innovation of AI has provided key technical support for the development of new teaching and learning terminals. However, these terminals are not included in the procurement list of educational departments, leading to the difficulty in fund declaration, said Liu Qingfeng, Deputy to the NPC and Chairman of the Board of iFLYTEK.

According to Liu, there is a lack of unified standard for new teaching and learning terminals. If the terminals equipped with subpar core technologies are used, it is easy to cause misleading in learning and bring hidden risks to information safety and students' eyesight.

Liu advised to enhance the guidance and promotion of terminals. First, develop standards on key technologies and products; second, ensure the promotion and fund support of terminals; third, encourage investment and promote the utilization of terminals.

Advancing the technical standards on digital transformation

Ma Huateng
Deputy to the NPC

The integration of digital and real economy at this crucial moment has confronted some problems, such as the low adaptability of technical applications with industrial demands and less interoperability between different digital tools, according to Ma Huateng, Deputy to the NPC and Chairman of the Board and CEO of Tencent.

"We should address the challenges by systematic concepts, making joint efforts to promote the transformation and upgrading of traditional industries," said Ma.

He advised that we should guide the research on core industries and key fields, give play to the leading role of technical standards, increase the preciseness and effectiveness of digital upgrading, explore the Chinese solution for the coordinated development of digitization and low carbon, summarize the advanced experience in public services, and enable the public to share the achievements.

(Translated by CSP based on news in Chinese)

Standards digitalization is the trend of the times

Interview with Wu Hequan, Academician of the Chinese Academy of Engineering and Chair of National Standardization Expert Advisory Committee

邬贺铨：标准数字化是大势所趋

Standards digitalization is a priority of future standardization work in China, as the National Standardization Development Outline puts forward “promoting the transformation of standardization in a digital, networked and smart way”. When delivering a report at the National Standardization Work Conference earlier this year, Tian Shinhong, Vice-Minister of State Administration for Market Regulation (SAMR) and Administrator of Standardization Administration of China (SAC), stressed to “vigorously promote the development of machine readable standards, and explore the new management mechanism of national standards in the context of digitalization”, and “strengthen the research on standards digital technologies, seize the trend of cutting-edge technologies and enhance the fundamental theories of standardization”.

China Standardization Press had an interview with Wu Hequan, Academician of the Chinese Academy of Engineering and Chair of National Standardization Expert Advisory Committee to find out his insights into standards digitalization and suggestions for future work.

Why standards digitalization is so important in the digital, networked and smart era?

Wu Hequan: The government work report of China in 2022 puts forward accelerating the integration of digital technologies and the real economy. In fact, the integration is reflected in many aspects such as how standardization integrates with digital technologies. Standards digitalization refers to using digital technologies to empower standards and their whole life cycle, so that the rules and characteristics of standards can be read, transmitted and accessed by digital devices. It is expected that standards can be developed, applied and promoted in a better way by using the new generation of digital technologies. Standards digitalization includes two parts: standards format and standardization methods.

China now is carrying out research on this subject, so is the international community. International Organization for Standardization (ISO) launched a SMART programme to produce Standards that are Machine Applicable, Readable, and Transferable (SMART), which is a milestone of standardization development.

The change from paper format to machine readable format becomes possible due to the development of digital technologies, which also meet the demands of social development. As standardization has penetrated into all aspects of the real economy, and machine has replaced humans in several scenarios, machine readable standards have become an irresistible trend of social development.

Take the surveillance videos in smart cities as an example. Tens of thousands of traffic surveillance cameras are connected to the traffic control center, but the scenes they took cannot be displayed simultaneously on the screen in the monitor room. It works in this way that the surveillance videos of each road are displayed on the screen for a minute. We hope that in the future the surveillance videos of all roads can be edited into a dynamic video for city traffic via artificial intelligence technologies to greatly improve the efficiency of monitoring. Another possible method is to let computer read these videos directly so that computer can understand the whole picture without human assistance. It is not only about the changes of reading methods, from people to computer, but also about the changes of some connotations, rules or indicators in standards.

We are now entering a new era of information technology; the whole society is evolving in a more digitalized, networked and smarter way. In the standardization area, it is reflected as standards digitalization.

What changes will standards digitalization bring?

First of all, standards format will change. In the past, standards were in paper format. If they are machine-readable in the future, standards will be searched and found by machine, then read and understood by machine, and at last applied by machine.

It is relatively easy to search standards by machine. However, it is very difficult to realize machine-readable. Why? Because standards focus on specific fields. The model and algorithm of artificial intelligence are improved through a lot of data training, which cannot cover all professional areas. Second, there is non-structural data in standards such as formula, charter and curve, which are difficult to understand by computer. Lots of work need be done to realize the visualization and readability of standards.

How to make standards machine-readable? We can start with the descriptive language of standards. Extensive Markup Language (XML) is now used to describe standards. Open-source software can also be used to describe standards, but only a limited number of standards are suitable for open-source software.

In addition to standards format, standards digitalization also means that digitalization runs through the whole life cycle of standardization to facilitate the development, application and promotion of standards. First of all, open-source software, such as an online collaborative platform, is used to accelerate the process of standards development and revision, encouraging more people to participate in the process and greatly reducing the development cycle. Generally speaking, standards are now revised every few years; however, open-source technology can speed up the development and revision of standards via dynamic upgrading.

Second, it will be easier to make standards comparison and find the relevance between standards and intellectual property. Using big data and artificial intelligence, we can make a quick comparison between international standards and national, association ones. In addition, standards digitalization helps us find the relevance between standards and intellectual property. For example, it is easy to retrieve the declaration information of stakeholders in the development process, whether the patent holder complies with the FRAND (Fair Reasonable and Non-discrimination) principles to give permission, or whether relevant intellectual property agency authorizes the patent or not, and so forth.

Third, it will support the supervision of standards application. As standards are digitalized, it is easy for regulators to check the compliance of standards implementation by examining the data.

Fourth, standards information can be retrieved quickly. When standards are machine readable, a great number of standards texts can be read and retrieved quickly by computer. Computer even can compile these standards texts into working instructions to guide standards implementation accurately. Standards digitalization will be not only beneficial to standardization technical committees, but also helpful for regulation departments and standards users.

What challenges will standards digitalization bring to technology and system?

Standards digitalization, a milestone in the standardization development history since the Industrial Revolution, is a main characteristic of standardization in the digital economy era. It creates a golden opportunity for innovation, boosts the reform of standardization methods and management system, but also brings unprecedented challenges.

First, management of standardization. Previously, standards are designed for people. But different people may have different understanding of standards, so every standard clearly indicates that who is responsible for the interpretation. If standards are read by machine, how can the ambiguity of standard provisions be understood without misinterpretation? Therefore, even in a machine-readable era, standards cannot be completely handled by machine, and they still need the intervention of people. When the intervention of people is needed, how to intervene and all such issues should be specified in the management rules.

Second, artificial intelligence technologies. Things work out when standards are read and applied by machine in 99% of scenarios; but erroneous judgement could happen in the rest. So how to avoid the misjudgment of artificial intelligence? When things go wrong about the machine readable standard, it is difficult to define who is responsible, the designer of machine algorithm, machine user or owner? Even so, we should not give up the efforts of promoting standards digitalization, as it is impossible to advance technology without attempts and application. To avoid risks, machine-readable standards can start from those standards that may not have a big impact even with erroneous judgment.

Third, cyber security. Machine readability inevitably uses computer system, and cyber system is very easy to be attacked. To realize standards digitalization, we should attach great importance to the security of relevant information systems. More importantly, since the reading of key standards cannot solely rely on machine, people should make the final check on the results.

What shall we do to realize standards digitalization?

It is a long way to go, as the task is too arduous. We must have a long-term plan and implement it in an orderly way.

First of all, the top priority is to develop a standard for machine-readable standards. The standard will specify the elements of machine readability and supporting technologies. Which are the most fundamental metadata of machine-readable standards. The descriptive languages of standard should be defined, such as XML, JSON (JavaScript Object Notation) or others. If multiple languages are used, the compatibility problems need to be solved. The unified format of expression by machine should also be defined for formula, arithmetic, flow chart, circuit diagram, curve chart, etc. Now, China National Institute of Standardization is assigned by SAC to conduct research in this area.

ISO, ITU and other standardization organizations overseas are also carrying out the research on standards digitalization. By now, there is no globally recognized machine-readable standard. But China is exploring in some areas. In 2017, the series of Chinese national standards for machine readable passport, visa and official travel documents, including GB/T 34974.1-2017, *Identification cards—Machine readable travel documents—Part 1: Machine readable passport*, were published, which adopt the ISO/IEC 7501 series. Because there is a chip embedded in passport, machine-readable passport in fact means to read the information in the chip. It is difficult to promote this method in machine-readable standards, as it is almost impossible to embed a chip in every standard.

Second, a professional platform needs to be established to support machine readability. Standards cannot be directly understood by artificial intelligence. We can use big data technology to establish a knowledge spectrum based on a great amount of standards texts, so as to find the pattern of machine readability. China Electronics Standardization Institute (CESI) is conducting the fundamental research on the specifications for standards knowledge spectrum, but relevant standards are not published yet.

As standards cover various areas, common knowledge spectrum is not enough. Standards knowledge spectra for professional fields should be developed together with a batch of cloud platforms for standards machine readability, covering the areas of machinery, electronics, biology, chemical industry, metallurgy, building, etc. All of these work needs the overall planning and coordination of SAC, so that the platforms can be set up to promote the application of standards digitalization.

Third, the training of professional standards drafters is important. Many standards drafters are well trained and experienced. They know how to draft standards, how to make the language simple and clear. But these standardization veterans may not be able to draft machine-readable standards by using XML language. On the other hand, IT experts are not familiar with the standardization rules and the expertise of a certain area. We need experts with professional background, who is familiar with both standards drafting rules and can use machine-readable technologies. However, such talents are rare, so we must put the training of these professionals on agenda as soon as possible.

Last but not least, management specifications for standards digitalization should be developed. Standards digitalization is a new topic, which involves the standardization life-cycle management. We must specifically modify relevant standardization rules and procedures; otherwise, the format and production mode of machine-readable standards texts will face legal problems. To promote the standardization work at the international level, we must strengthen the international cooperation on the standards digitalization research.

To realize standards digitalization, we cannot rush for actions without overall planning and trials. The most effective application scenario of machine-readable standards is that production equipment automatically implement processes following the requirements of standards. Machine-readable standards can be applied in these cases. It is extremely heavy workload to change all existing standards into machine-readable ones, so we must make a long-term plan.

In a nutshell, standards digitalization is a rare opportunity for the development of standardization, which brings new challenge for standardization research and development, application and management of standards.

采写/张佩玉　编译/曹欣欣

(Chinese version written by Zhang Peiyu; edited and translated by Cao Xinxin)

Views on the digital transformation of standards in China

Interview with Yu Xinli, President of China Association for Standardization (CAS)

于欣丽：对我国标准数字化工作的思考

To better understand the digital transformation of standards as a priority of future standardization work, China Standardization Press interviewed Yu Xinli, President of China Association for Standardization (CAS), who shared her views and thoughts about the topics such as progress and typical practices at national and international levels.

Background of digital transformation

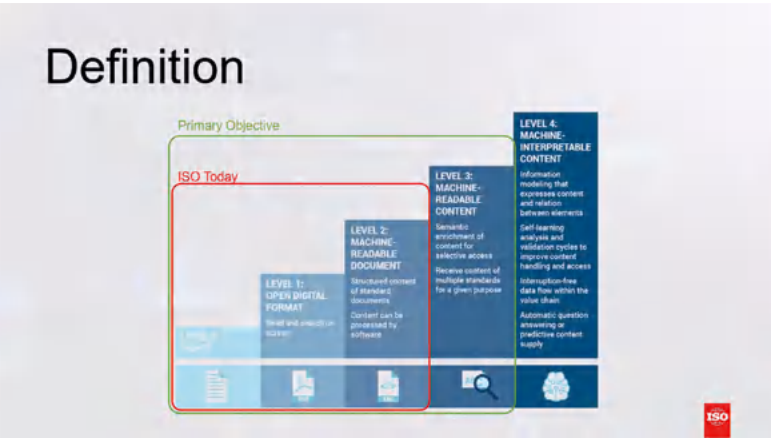
Chinese President Xi Jinping pointed out that we should vigorously develop the digital economy in China, commercializing digital technologies and upgrading industries with digital transformation and promoting an in-depth integration of digital economy and real economy.

Developed countries and regions, such as EU, Germany, the UK, and the US, have attached great importance to the development of digital economy. They have been integrating new technologies in key national infrastructure projects and sectors including manufacturing, and promoting a new international market to enhance their competitiveness and global leadership.

It is clear that successful digital transformation of standards will not only affect the efficacy of digital transformation in all sectors, but also determine the driving forces and potentials of digital economy. It also sets the tune of China in its future cooperation with other nations, integration to the international trade system, and contribution in the world development.

Progress at national and international levels

The core of digital transformation of standards is to realize digitalized standards - to make standards machine applicable, readable, and transferable (SMART), as defined by ISO and generally accepted at home and abroad now. ISO sets five layers of SMART standards, such as paper, open digital, machine-readable, and machine-interpretable standards.



To make progress in digital transformation of standards, we shall carry out work in two aspects: one is to perform digitalized transition of existing standards only with hard copies, and promote the digital versions in use and management; the other is to directly develop the digital version of new standards and implement digitalized application and management of the standards.

Standardization organizations at national and international levels have carried out research and practices focusing on the digital transformation of standards.

· ISO/IEC

Applying machine-readable standard (MRS) has been taken as a strategic topic by ISO. In 2018, ISO/TMB established a strategic advisory group known as SAG MRS, which investigates the demand on MRSs and assesses potential opportunities and challenges.

As stated in its development plan of 2017, IEC continued to take actions to cope with radical changes that impact the operation of its core business, including open data projects, and new types of standards in machine readable format. In 2018, IEC set up a strategic group on digital transformation known as SG 12 under SMB.

· CEN-CENELEC

CEN and CENELEC launched the Strategic Plan for Digital Transformation in 2017, and carried out pilot projects in 2019. They also performed in-depth legal analysis of the content and IPR protection of digital standards.

In 2021, CEN and CENELEC issued the *CEN-CENELEC Strategy 2030* to lead their strategy direction for the decade to come, in which standards are taken as the key tool to promote the flexible, green and digital transition of EU industrial ecosystem. They were also committed to advancing the standardization work with the most state-of-the-art technologies.

· Germany

In 2017, Germany released *German Standardization Strategy*, proposing 6 major goals to "shape the future with standardization", pointing out the integration of open source projects and digital transition and taking advantage of open source technologies and methods in standardization.

Based on the strategy, DIN and DKE have taken machine executable standards as a vital means to realize goals and underpin the Industry 4.0 in Germany.

· US

ANSI has listed the SMART standards an important issue in standardization strategy in its annual report 2019-2020.

· UK

In 2021, the UK government launched the *Standards for the Fourth Industrial Revolution: HMG-NQI action plan*. To realize the action plan, the UK government and the NQI partners shall work in partnership to implement 6 actions to unlock the full potential of voluntary standards, support innovation and enable its swift and safe commercialization. The joint action plan will ensure the effective coordination between standards, policy making and strategic research.

The second action focuses on accelerating the digitalization of standards, including further developing BSI's capability to deliver machine-readable standards, overhauling its digital platform to improve the accessibility of standards content and information, and facilitating feedback on existing standards and supervision of standards development process, as well as developing the frameworks, good practice guides, and skills training materials needed for digitalized standards.

· China

In October 2021, China has issued an outline to promote standardization development at the national level. The document has put "constantly improving the digitalization of standards" as one of the strategic goals, and proposed the development on SMART and open source standards, so as to promote the transition of standards in a digitalized, cyberized and smart manner.

In December, the *14th Five-Year Plan for Promoting the High-Quality Development of the National Standards System* put forward stepping up efforts in building pilot projects on digitalized national standards, and trying to provide national standards in new forms, such as machine-readable, open-source and database forms. It also urged to establish information systems that support the digital transition of national standards.

In terms of organization, ISO/IEC JTC1/SC7/AHG 4 is established to focus on software development, engineering, and system construction of machine-readable standards. In January 2022, a new WG on the digitalization and standardization of national standards started soliciting members from the public.

Typical practices

So far, explorations and experiments have been carried out at various levels.

1. ISO/IEC Online Standards Development Platform (OSD)

ISO and IEC have created this online platform for thousands of experts in standardization area around the world. The platform now is open for trial run.

The platform is designed to provide better:

· Collaboration – experts work collaboratively on a standard in real-time from the preparatory stage

· Accuracy and quality – it takes care of the structure and quality of the document, so experts can truly focus on content

· Straightforwardness – online commenting and comment resolution
· Integration – the platform is accessible via existing ISO and IEC standards development tools
· NISO STS (NISO Standards Tag Suite) – a content development system based on standards
· Harmonization – IEC/ISO standards development and processes

The core of the platform is Fonto Editor, a tool developed by Fonto company compatible with NISO STS schema which allows for semantic enrichment. Fonto Editor is an XML-based tool that allows standards authors, editors and reviewers to exchange comments on standards contents and use metadata. It has proved to be useful in the whole workflow of drafting a standard, supporting experts with its easy-to-use configuration, high compatibility, supportive online coordination and revision control.

IEC and ISO are now using NISO STS, so are CEN-CENELEC and its members.

2. ISO/TC 37, *Terminology and other language and content resources*

As one of earliest TCs of ISO, ISO/TC 37 has formulated series standards concerning structured contents, including management on terminology resource and language resources. Over 20 standards have provided important reference for the process and treatment of digitalized standards in terms of text, standards analysis, tagging and processing.

3. Practices of the AVIC China Aero-Polytechnology Establishment

China Aero-Polytechnology Establishment has drawn upon past experiences, and developed management tools, such as the standards structural processing system and standardization management system, to meet the service demands. It is able to provide series of services by tools including fragment processing of standards, structured tagging on contents, data management, process management, and intelligent services.

4. Standards service system in the National Library of Standards

The National Library of Standards under CNIS is the only institute in China that collects, studies, and provides service on national standards literatures and standardization library science. By using information technologies, for instance, natural language processing (NLP) technology, the Library has performed structural processing on standards literatures, extracted key technical indicators from standards texts, and built a sound literature data base covering all major international and domestic standards in all sectors. Meanwhile, it has launched study on building standards knowledge bases, standards information system, and special data bases, and provided services on content revelation, indicator comparison and big data analysis of standards.

Future challenges

All parties involved have reached a consensus on the importance of digital transformation of standards, but differed from each other over features, mechanism, technologies, forms, and models in detail. There are still challenges needing in-depth study.

On policies and planning

We will pursue and follow related policies by setting up a sound system that ensures progress on the digital transformation of standards with solid steps, facilitates the integration of digitalized standards in all sectors, and promote the digital transformation program.

In the era of digitalization for all, we should put the top-level planning in place through a detailed implementation plan and ensure the participation of all stakeholders, including specialists in standardization, technologies and industries and common users.

We will seize the opportunity of the digital transformation of standards and strive to lead the standardization in relevant fields in the world by strengthening cooperation with ISO and IEC.

On mechanism

We must consider the mechanism and main contribution of digitalized standards on supporting the digital economy, to facilitate the interaction between digitalized standards and major factors of NQI.

We need to explore how digitalized standards promote the restructuring of industries and social governance, since it is important to stimulate technical innovation and promote in-depth integration between digital transformation of standards and industries. We should also consider its effect on the value chain of companies.

On implementation

We should dig out the demands on digital transformation of standards in all sectors, including the models and commonalities of the services they require, and well coordinate the study on general technologies and the research on sector-specific application to avoid repeated research and unnecessary investment.

Digital transformation of standards will bring changes to forms, life cycles, research procedures, management patterns, and service modes of standards. The pain points in the process need to be resolved by technical and management means.

There are discrepancies in the use of terminologies and indicators in existing standards. We need to take actions to make sure future digital management, application and services will not be affected.

编译/刘宏博
(Edited and translated by Liu Hongbo)

CEN publishes 82 new technical specifications on fertilizing products

The new Fertilizing Products Regulation (FPR) (Regulation (EU) 2019/1009) will enter into force in July 2022, repealing Regulation (EC) No 2003/2003. The new Regulation introduces new requirements related to quality, safety, and labeling of fertilizing products and extends the scope to organic fertilizers, organo-mineral fertilizers, growing media, biostimulants, and other products. The Regulation also harmonizes EU rules for products derived from waste organic materials and by-products and provides rules to recover nutrients into secondary raw materials.

In so doing, the Regulation significantly contributes to the EU Circular Economy objectives.

In February 2020, the European Commission notified CEN with a Standardization Request in support of the FPR. The Standardization Request called for European Standards (EN) and Technical Specifications (TS) to provide analytical methods to be used by producers to verify the compliance of their products with the Regulation. The deliverables based on this Standardization Request will ensure full harmonization of the European Single Market, granting producers access to CE marking, and will play a pivotal role in fostering the use of organic and bio-waste-based fertilizers. They will provide testing methods for safety and environmental criteria, such as pathogen detection and contaminants determination.

The Standardization Request is structured following a "two-step approach": the TS describe the testing methods, which are then validated through interlaboratory studies and consolidated in subsequent European Standards (ENs).

The ENs which will follow-up on these TS are currently under development and are expected to be published in 2024 and 2025.

(Source: CEN/CENELEC)

From the vertical farm to the supermarket

Produce from vertical farms is beginning to appear on supermarket shelves around the world. The proponents of vertical farming believe it can feed millions of people while reducing some of the negative aspects associated with current agricultural practices: carbon-emitting transportation, deforestation and an over-reliance on chemical fertilizers.

Vertical farming is defined as the production of food in vertically stacked layers within a building, such as a skyscraper or warehouse, without using any natural light or soil. Produce is grown in a controlled environment where elements including light, humidity, and temperature are carefully monitored.

The result provides urban dwellers with year-round access to fresh vegetables since they can be grown regardless of weather conditions, without the need for pesticides and have only a short distance to cover, from farm to plate. According to the research company Statista, the industry is expected to grow to $9.7 billion worldwide by 2026.

A network of sensors and cameras collects data with detailed information about the plants at specific points in their lifecycle as well as the environment in which they grow. This data is not only monitored but also analyzed to enable decisions to be taken that will improve plant health, growth and yield.

The use of artificial intelligence is becoming increasingly important to ensure that production yields and produce quality remain high.

IEC Standards are essential to the technology used in vertical farms. The Joint Technical Committee of IEC and ISO on information technology (ISO/IEC JTC 1) prepare international standards that contribute towards artificial intelligence (AI). Given the rapid developments in AI across many industries, SC 42 was set up in 2017 with the mandate of providing standardization in the area of AI as well as guidance to other committees developing AI applications.

(Source: IEC)

EEDAL-LS-2022: International Conference on Energy Efficiency in Domestic & Light Sources

June 1-3, Toulouse, France

The LS/EEDAL joint conference will take place on June 1-3 in hybrid forms, which will gather high-level experts in the field of energy efficiency and light sources. With the support of CEN, CENELEC and other organizations, the conference is organized by the EU Commission.

The International Symposium on Science and Technology of Lighting (LS-series) serves as a platform for the worldwide community of engineers and scientists from the lighting industry, research organizations and academia to share and exchange the latest progress on science and technology of lighting. The International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL) is an influential and recognized international event where experts discuss the progress achieved and latest developments in technologies, behavioral aspects and policies.

For more information on the event website: **https://eedal-ls21.sciencesconf.org**

ITU World Telecommunication Development Conference (WTDC)

June 6-16, Kigali, Rwanda

ITU members and other relevant attendees annually gather at WTDCs to consider topics, projects and programmes relevant to telecommunication development. WTDC-21 will be held on June 6-16 in Kigali, Rwanda.

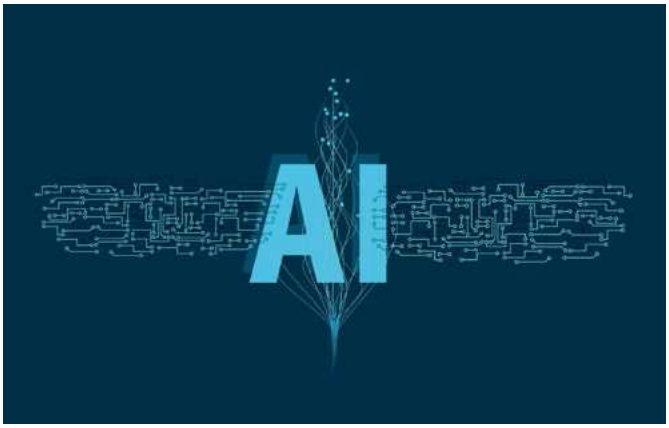
Under the theme "Connecting the unconnected to achieve sustainable development", WTDC-21 is a unique opportunity to develop innovative approaches and new models of collaboration for connectivity and digital solutions in this final Decade of Action to achieve the SDGs. Also, attendees will set the strategies and objectives for the development of telecommunications/ICT, providing future direction and guidance to the ITU Telecommunication Development Sector (ITU-D).

For more information on the event website:

https://www.itu.int/en/ITU-D/Conferences/WTDC/WTDC21/Pages/default.aspx#

Putting Science Into Standards workshop

June 8, virtual



CEN and CENELEC, together with the European Commission's Joint Research Centre (JRC), carry out an annual "foresight on standardization" exercise under the Putting Science into Standards (PSIS) initiative. The 2022 PSIS workshop will focus on the topic of "Data quality requirements for inclusive, non-biased, and trustworthy artificial intelligence".

Bias in existing state-of-the-art AI models has been widely proven, raising concerns on societal consequences. Researchers in academia and industry have proposed different methods to eliminate bias, starting from the input data and by curating the AI model training. However, no common approach to measure requirements in data quality has been defined.

Standards and guidelines are needed to define types of data used in creating AI models to ensure that bias is not present. Ensuring that AI model data upholds quality standards that result in non-biased, inclusive AI systems will provide the right foundation from which trustworthy AI can be further developed and deployed to improve citizens' lives.

For more information on the event website:

https://www.cencenelec.eu/news-and-events/events/2022/2022-06-08-psis

2022 IEEE Power & Energy Society General Meeting

July 17-21, Denver, Colorado

The 2022 IEEE Power & Energy Society (PES) General Meeting GM will be held in person in Denver, Colorado on July 17-21.

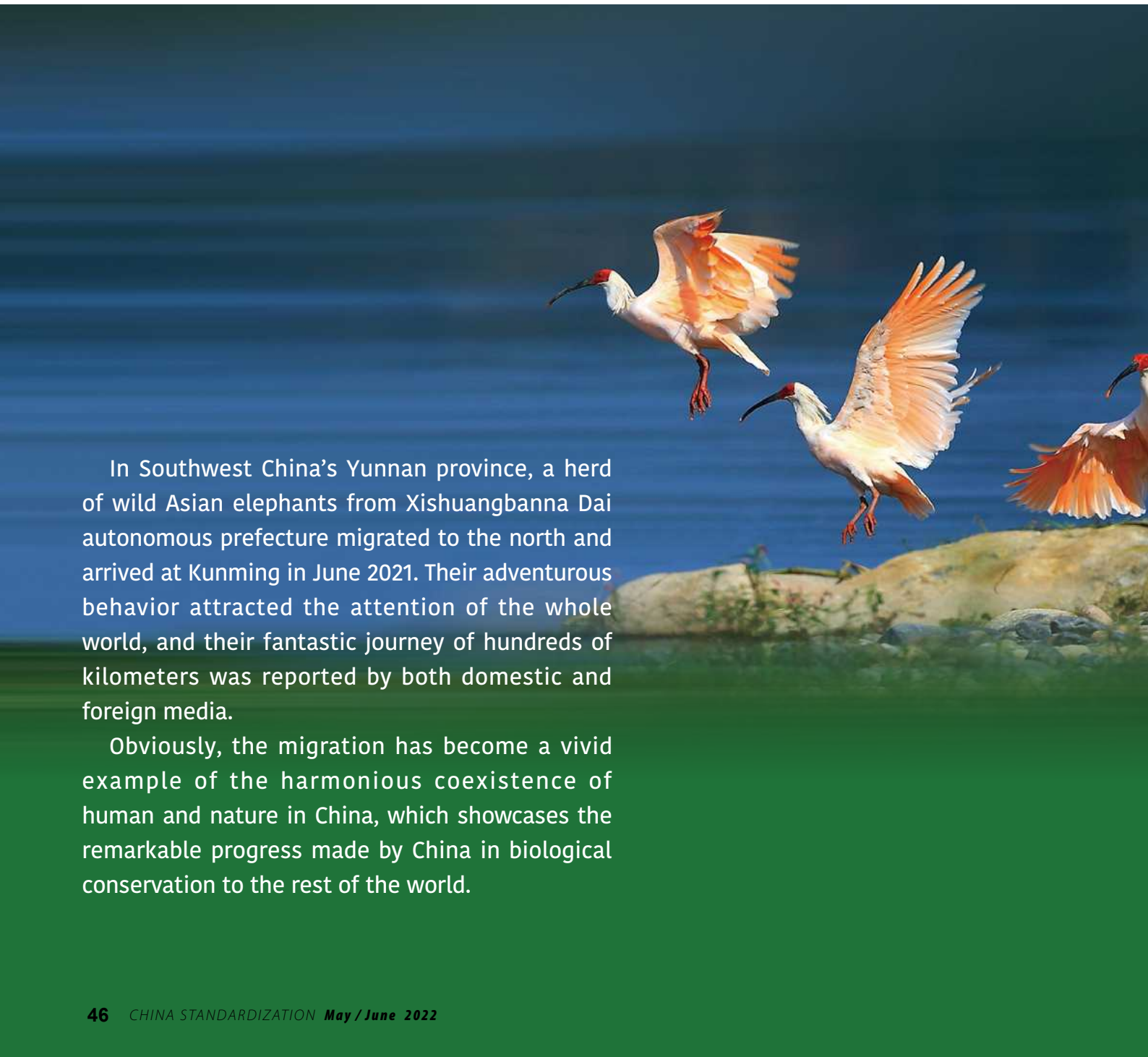
The theme of this year's conference is "Powering a Sustainable Future in a Changing World". It is the premier annual power engineering conference presented by IEEE PES that will bring together leading power engineers and key academics from all over the world. The aim is to provide an international forum for experts to promote, share, and discuss vital issues and progressive developments in the field of electrical power engineering.

During the previous meeting, approximately 2,000 global attendees from 59 different countries participated in the event, including over 190 webinars.

For more information on the event website: **https://pes-gm.org**

BIODIVERSITY
enables a beautiful China with vitality

By Jin Jili
文/靳吉丽



In Southwest China's Yunnan province, a herd of wild Asian elephants from Xishuangbanna Dai autonomous prefecture migrated to the north and arrived at Kunming in June 2021. Their adventurous behavior attracted the attention of the whole world, and their fantastic journey of hundreds of kilometers was reported by both domestic and foreign media.

Obviously, the migration has become a vivid example of the harmonious coexistence of human and nature in China, which showcases the remarkable progress made by China in biological conservation to the rest of the world.

CONSERVATION

生物多样性保护: 美丽中国生机盎然

Why biodiversity matters?

Experts believed that the places these elephants went through are ecologically balanced with rich varieties of plants and large areas of forests, which has provided a safe passageway and comfortable breathing space, making it possible for them to achieve a successful long-distance migration.

Because of China's great efforts in the past four decades, the number of wild Asian elephants has increased from 180 in the 1980s to about 300 at present, according to the National Forestry and Grassland Administration.

Why biodiversity matters? Biological diversity refers to the variety of living species including plants, animals and microorganisms in their natural environments and the aggregate of the related ecological processes. It serves as the basis for human survival and development.

Biodiversity resources are the pillars upon which we build civilizations. Fishes provide 20 percent of animal protein to about 3 billion people, and plants provide over 80 percent of human diet. However, people's excessive exploitation and utilization of such resources have seriously threatened biodiversity; species across the world are extinct at an alarming rate, leading to chain reactions in the biologic chain and affecting the survival of other species as well.

Recognizing the importance of biological conservation, the international community began to take action. In 1972, a declaration with the conservation of bio-resources in its 26 principles was signed by nations at the United Nations Conference on the Human Environment. In 1993, the *Convention on Biological Diversity* came into effect, ushering in a new era for the protection of global biodiversity.

To increase people's awareness and understanding of biodiversity issues, the International Day for Biological Diversity (IBD) is celebrated every year on May 22. This year's theme is "Building a shared future for all life". It delivers the message that biodiversity is the foundation upon which we can build back better, and focuses on the new global biodiversity framework, which will be adopted at the upcoming 15th meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 15) in Kunming, Yunnan province, China.

Biodiversity conservation in China

China is one of the most biodiverse countries in the world with unique ecosystems, abundant species and rich genetic variety. As one of the first countries to sign the *Convention on Biological Diversity*, China has always attached great importance to biodiversity conservation, achieving substantial progress on a distinctively Chinese path.

· Optimizing in-situ conservation

Over the past few decades, China has set up protected areas (PAs), opened national parks on a trial basis, implemented the red line strategy for ecological conservation, and designated priority areas in biodiversity conservation. These measures have contributed to the conservation of key natural ecosystems, biological resources and habitats for key species.

Since the first nature reserve was set up in 1956, China has established close to 10,000 PAs of all types and at all levels, accounting for about 18 percent of its total land area, pointed out by the white paper Biodiversity Conservation in China released in October 2021.

The habitats for wild animals have been expanding with growing populations. For instance, giant pandas in the wild have grown from 1,114 to 1,864 over the past four decades, and the crested ibis population has increased from only 7 to over 5,000.

· Improving ex-situ conservation

China has set up a relatively complete ex-situ conservation system, which includes botanical gardens, wildlife rehabilitation and breeding centers, germplasm resource centers, and gene banks.

According to the white paper, China has built about 200 botanical gardens and arboretums exhibiting 23,000 species of plants, and 250 wildlife rehabilitation and breeding centers where over 60 types of rare and endangered wild animals are successfully bred.

The Germplasm Bank of Wild Species, a world-class preservation system for germplasm resources of wild species located in Kunming, had preserved 85,046 wild plant seeds of 10,601 species by the end of 2020.

· Improving biosecurity governance

In China, biosecurity has been included in the national security system, and the *Biosecurity Law* was promulgated in 2021. Lists of invasive alien species cover a total of 83 invasive species detected in the country. Over 200 technical norms on the safety testing, assessment, supervision and regulation of genetically modified organisms have been released.

Great efforts have been made to improve the mechanism for preventing the invasion of alien species, promote the sound development of biotechnologies, and strengthen the protection and regulation of biogenetic resources to constantly improve national biosecurity governance.

· Improving eco-environment and green development

China has carried out at least 35 conservation and restoration projects, and fought a tough battle against pollution. It has also taken measures to promote green development in all aspects with coordinated efforts.

Between 2016 and 2020, China restored 1,200 kilometers of coastline and 23,000 hectares of coastal wetlands. Between 2000 and 2017, China contributed about 25 percent of global vegetation growth, the biggest share among all countries.

In 2020, China's average concentration of ambient particulate matters ($PM_{2.5}$) was 33 $\mu g/m^3$, down by 28.3 percent from 2015, and the percentage of days with good air quality rose by 5.8 percentage points from 2015.

Enhanced international cooperation

Biodiversity loss and ecosystem degradation pose huge threats to human survival and development. Facing these global challenges, China has actively carried out international cooperation, contributing solutions to global biodiversity conservation and working together with the international community to build a shared future for human and nature.

Over the past years, China has actively implemented the *Convention on Biological Diversity* and related protocols, and submitted high-quality national reports on a regular basis. It has become the largest contributor among developing countries to the Global Environment Facility. China National Biodiversity Conservation Strategy and Action Plan (2011-2030) was published in 2010 to create a better ecological environment.

China has also strengthened international exchanges and cooperation with the support of multilateral cooperation mechanisms, such as the Belt and Road Initiative and South-South Cooperation. The Belt and Road Initiative International Green Development Coalition has been established, attracting partners from over 40 countries.

Guided by the vision of building a global community of shared future, China will continue to contribute its part to global environmental governance, said Chinese President Xi Jinping at the UN Summit on Biodiversity on September 30, 2020.

New expectations ahead

Held in Kunming in hybrid format in October 2021, the first part of COP 15 was expected to provide a roadmap for the further negotiations of the post-2020 global biodiversity framework. *Kunming Declaration* was approved to vigorously enhance global biodiversity conservation with a clearer vision for the coexistence of human and nature.

The second part of COP 15 will take place in the third quarter of 2022, which will convene governments from around the world to agree to a new set of goals for nature over the next decade.

With new expectations ahead, China will continue to play a big role in the global biodiversity governance, making China a more beautiful and bio-diversified country.

Facts & figures

Since the first nature reserve was set up in 1956, China has established close to **10,000** PAs of all types and at all levels, accounting for about **18** percent of its total land area.

Giant pandas in the wild have grown from **1,114** to **1,864** over the past four decades, and the crested ibis population has increased from **only 7** to over **5,000.**

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(Source: Biodiversity Conservation in China)

Standards facilitate better biodiversity conservation

标准助力生物多样性保护

By Jin Jili
文/靳吉丽

China has made historic achievements in ecological conservation and restoration over the past decade by putting biodiversity as a top priority, making long-term plans and taking a series of measures. Standards have also played an important role in facilitating better biodiversity conservation at both national and international levels.

Looking into the distance from the space, Qinghai Lake, the largest inland saltwater lake in China, is like a giant sapphire inset into the Qinghai-Tibet Plateau. The water area of Qinghai Lake has reached 4,625.6 square kilometers, increasing nearly 220 square kilometers compared with that 10 years ago, equivalent to the area of 34 West Lakes in Hangzhou, according to the latest satellite remote sensing data. The previous huge area of sand has become a wide range of wetland.

China has taken a series of measures including wetland preservation, degraded grassland governance, and terrestrial biodiversity conservation to enable the transformation of Qinghai Lake from ecological deterioration to ecological prosperity.

Biodiversity conservation is closely related to the well-being of people and the future of the nation. In fact, China has continuously improved the laws, regulations and work mechanisms on biodiversity conservation, since it signed the *Convention on Biological Diversity* in 1992.

Policy support

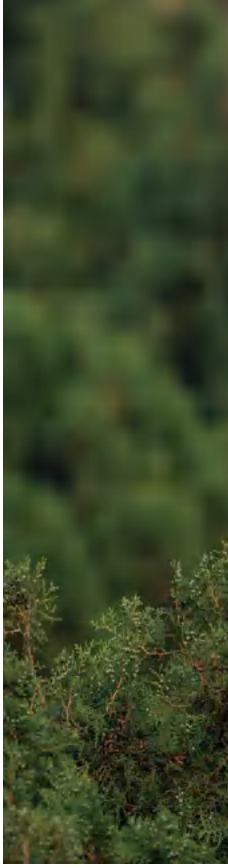
To enhance collaboration and improve work efficiency, the national coordinated work mechanism was established by the State Council in 2011. China National Committee for Biodiversity Conservation was chaired by Vice Premier of the State Council and composed of 23 departments under the State Council, aiming to promote the national work on biodiversity conservation in a coordinated way.

Biodiversity conservation has been placed high on the agenda after China put forward vigorously promoting ecological progress at the 18th National Congress of the Communist Party of China (CPC) held in 2012. By far, more than 50 laws and regulations have been promulgated and revised, such as the *Law on the Protection of Wildlife* and *Regulations on Nature Reserves*, which provide a strong legal basis for biodiversity conservation in China.

Regulations and specifications have also been formulated by relevant industrial competent departments and provincial governments. For instance, the *Regulations on Biodiversity Conservation in Yunnan Province*, the first of its kind, was released in 2019.

In terms of plans and programs, the Action Plan on Biodiversity Conservation in China was released in 1994. After that, a series of plans and outlines have been implemented successively for nature reserve protection, ecological environment construction, ecological environmental protection as well as the utilization and protection of biological species and resources.

In 2010, the Strategy and Action Plan on Biodiversity Conservation in China (2011-2030) was



implemented, which specified the overall objectives, strategic tasks and priority actions. In addition, biodiversity conservation has been included in other national plans for economic and social development, ecological conservation and restoration, and territorial space planning.

The recent move to enhance biodiversity conservation is a guideline released by the CPC Central Committee and the State Council in October 2021, which sets the goal of bringing 77 percent of national key wildlife species under protection by 2025 with cutting-edge technologies. The document also makes detailed plans to intensify biodiversity conservation, including measures to improve policies and regulations, integrate the issue into long-term plans of different regions and sectors, as well as establish a complete monitoring system.

Standards development in China

To put the *Environmental Protection Law* in place and better protect the ecological environment in China, a great number of national standards have been released by the Ministry of Ecology and Environment (MEE) in recent years.

Six national standards were published in 2011, including HJ 623-2011, *Standard for the assessment of regional biodiversity*. The standard specifies the indicators and their weights, data collection and processing, calculation methods and grading of regional biodiversity assessment, to comprehensively improve the management of biodiversity conservation in China.

In 2014, 11 national standards were released for the biodiversity monitoring of terrestrial vascular plants, lichens and bryophytes, terrestrial mammals, birds, reptiles, amphibians, inland-water fish, freshwater benthic macro invertebrates, butterflies, large and medium-sized soil animals, as well as macro fungi. HJ 710.1-2014, *Technical guidelines for biodiversity monitoring—terrestrial vascular plants*, stipulates the main content, technical requirements and methods for the biodiversity monitoring of terrestrial vascular plants.

In 2021, another 12 national standards were published, such as HJ 1176-2021, *Technical specification for investigation and assessment of national ecological status—Data quality control and integration*.

China Biodiversity Conservation and Green Development Foundation (CBCGDF), founded in 1985, is the most influential foundation in the field. In recent years, it has developed several association standards on biodiversity conservation, such as T/CGDF 00005-2020, *Standard for biodiversity investigation and monitoring*, T/CGDF 00006-2020, *Standard for biodiversity assessment*, T/CGDF 00007-2020, *Standard for biodiversity restoration*, T/CGDF 00008-2020, *Specification for biodiversity adaption*, T/CGDF 00009-2020, *Standard for biodiversity compensation*, as well as T/CGDF 00029-2022, *Standard for biodiversity planning*.

T/CGDF 00029-2022 defines the basic requirements, fundamental principles, operational instructions of biodiversity planning, which provides a reference for government departments and environmental impact assessment bodies to carry out biodiversity planning and construction.

These association standards have filled the blank in the area, playing an essential role in facilitating the biodiversity conservation and related work in China.

International efforts

At the international level, ISO/TC 331, *Biodiversity*, was established in 2020 with its secretariat undertaken by AFNOR, the ISO member of France. The technical committee is designed to develop principles, framework, requirements, guidance and supporting tools in a holistic and global approach for all organizations, to enhance their contribution to sustainable development. It has 36 participating members and 20 observing members.

By far, ISO/TC 331 has set up a working group on terminology, a chair's advisory group and three ad hoc groups on organizations, strategies and sustainable use, restoration, conservation and protection, as well as measurement, data, monitoring and assessment respectively.

At present, ISO/AWI TS 13208-1, *Biodiversity—Vocabulary—Part 1: General terms*, is under development. It is the first and prior standard project approved within ISO/TC 331, which is proposed by the experts from China National Institute of Standardization (CNIS). As the domestic mirror committee, CNIS has been actively participating in the international standardization work on biodiversity.

CBCGDF, a first-class national institute, has taken the international standards development as a key priority to participate in the global environmental governance. Three experts from the standards work committee of CBCGDF attended the second plenary meeting of ISO/TC 331 held in virtual form in April 2022. The meeting attracted more than 100 representatives from over 20 countries and international organizations such as International Union for Conservation of Nature (IUCN) and Environmental Coalition on Standards (ECOS).

China has been strengthening international exchanges and cooperation on biodiversity conservation to jointly meet global challenges, endeavoring to contribute its share to global environmental governance and play a bigger role in realizing the vision of harmony between human and nature.

Improving biodiversity by protecting pandas and their habitats

大熊猫保护带动生物多样性蓬勃发展

By Cao Xinxin
文/曹欣欣

Giant panda, with distinctive black and white coat, is adored by the world and regarded as the national treasure of China. According to the research data, panda has lived on the earth for at least eight million years, that's why it is known as the "living fossil".

With a round face, bulky body, strong arms and legs, giant panda has taken bamboo rather than meat as its principal food for at least three million years. The species symbolizes peace and harmony, which is pursued by the Chinese people for more than 5,000 years. Lovely appearance, long history, rareness, and peaceful nature from the Chinese traditional culture, all these characteristics make giant panda unique and become the national treasure of China.

Once endangered species

Giant panda had long been considered as an endangered species by the International Union for Conservation of Nature (IUCN).

There are many reasons for this. Indigenous to China, pandas live in temperate forests in the mountains of southwest China. They are very picky about food, and their diet heavily rely on bamboos. As much as 90-98 percent of pandas' diet consists of the leaves, shoots and stems of bamboo, which is available in most forests of southwest China. They must eat about 26 to 84 pounds of bamboos every day, depending on the parts of bamboo they eat.

Human's poaching of pandas and destruction of their habitats have restricted the species to remote fragments of mountain habitats along the eastern edge of the Qinghai-Tibet Plateau in the three provinces of Sichuan, Shaanxi and Gansu. Forest loss reduces pandas' access to the bamboos they need to survive. Periodic flowering and massive die-offs of bamboos have also brought starvation. These are the most serious threats to their survival.

From "endangered" to "vulnerable"

To protect the endangered giant pandas, the Chinese government has made great efforts to preserve their habitats and link important biological corridors for decades, which spanned over three provinces and two of the country's largest river basins.

Since the 1960s, China has successively established 67 giant panda sanctuaries, 46 of which are located in Sichuan province. Sichuan has protected and restored the habitat of pandas by carrying out projects of returning farmlands to forests, research on artificial breeding and experiment of sending captive pandas to the wild.

After launching the pilot project of giant panda national park in 2018, Sichuan has invested about 400 million yuan($59.28 million) to construct the biological corridors of giant pandas, restoring 68 kilometers of vegetation along the corridors and 28 square kilometers of habitats and creating favorable conditions for isolated small population of pandas.

Now, the Sichuan Giant Panda Sanctuaries is the home to more than 30% of the world's giant pandas and one of the most important sites for their captive breeding. The sanctuary is also a refuge to other endangered species such as red panda, snow leopard and clouded leopard. It is among the botanically richest sites of the world, and is home to between 5,000 and 6,000 species of flora. Because of biodiversity conservation, these sanctuaries were listed as UNESCO World Heritage Sites in 2006.

As of now, the population of giant panda is 1,864 in the wild and 673 in captivity. The extinction risk of panda was changed from "endangered" to "vulnerable" by IUCN in 2016, thanks to China's efforts in the protection of pandas and restoration of their forest habitats over the years.

Umbrella effect

The Sichuan Giant Panda Sanctuaries is an alive museum to some extent, as it is one of the botanically richest sites in the world. It was also selected as one of the biodiversity hotspots in the world by Conservation International, an international organization working on spotlighting and securing the critical benefits that nature provides to humanity. Now 36 areas as biodiversity hotspots represent just 2.5% of the earth's land area, but support more than half of the world's plant species as endemics and nearly 43% of bird, mammal, reptile and amphibian species as endemics.

Giant pandas, serving as an umbrella species, protect other species of flora and fauna in their habitats. "The Sichuan branch of Giant Panda National Park has protected more than 8,000 kinds of flora and fauna by making pandas playing a crucial role as umbrella species. We have found other rare animals in this area for more than 1,600 times during patrol," said Ran Jianghong, President of Sichuan Association for Wild Animals and Plants.

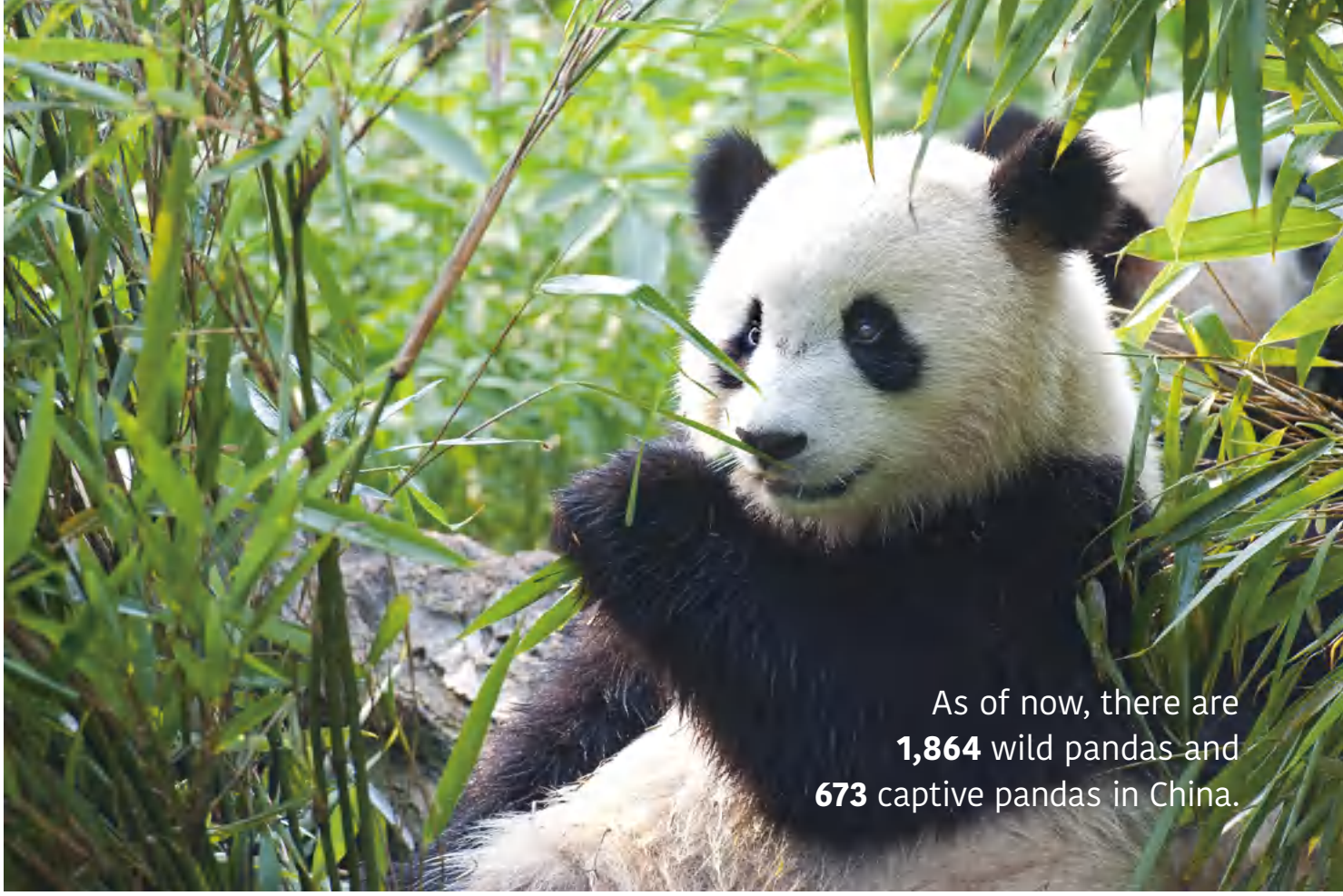
Song Dazhao, head of China Felid Protection Union said, generally speaking, umbrella animals are those on the top of the food chain. To protect them, you must conserve the habitat and the whole food chain. But giant panda is an atypical umbrella animal, and mainly eats bamboos rather than meat.

Vital role of standards

Standards play a big role in protecting giant pandas, restoring their habitats and improving biological diversity in China. The national standard HJ 623-2011, *Standard for the assessment of regional biodiversity*, defines the indexes and their weight, data collection and processing, calculation method, and classification of biodiversity assessment, which helps understand the conditions, regional distribution and trend of changes of biodiversity across the country so as to improve the management of biodiversity protection.

The sectoral standard LY/T 2365-2014, *Technical regulations of the vegetation restoration in habitat of giant panda*, stipulates the goals, principles and measures of restoring vegetation in the habitats of pandas. Another sectoral standard LY/T 1845-2009 provides requirements for the monitoring of giant panda and its habitat.

Sichuan, known as the home to wild pandas, has also developed a local standard for the restoration or reconstruction of pandas' habitats, which may be destroyed by natural disasters or human destruction. DB 51/T 2028-2015 defines requirements for the selection of species, technical points, monitoring elements, etc., in the restoration or reconstruction.

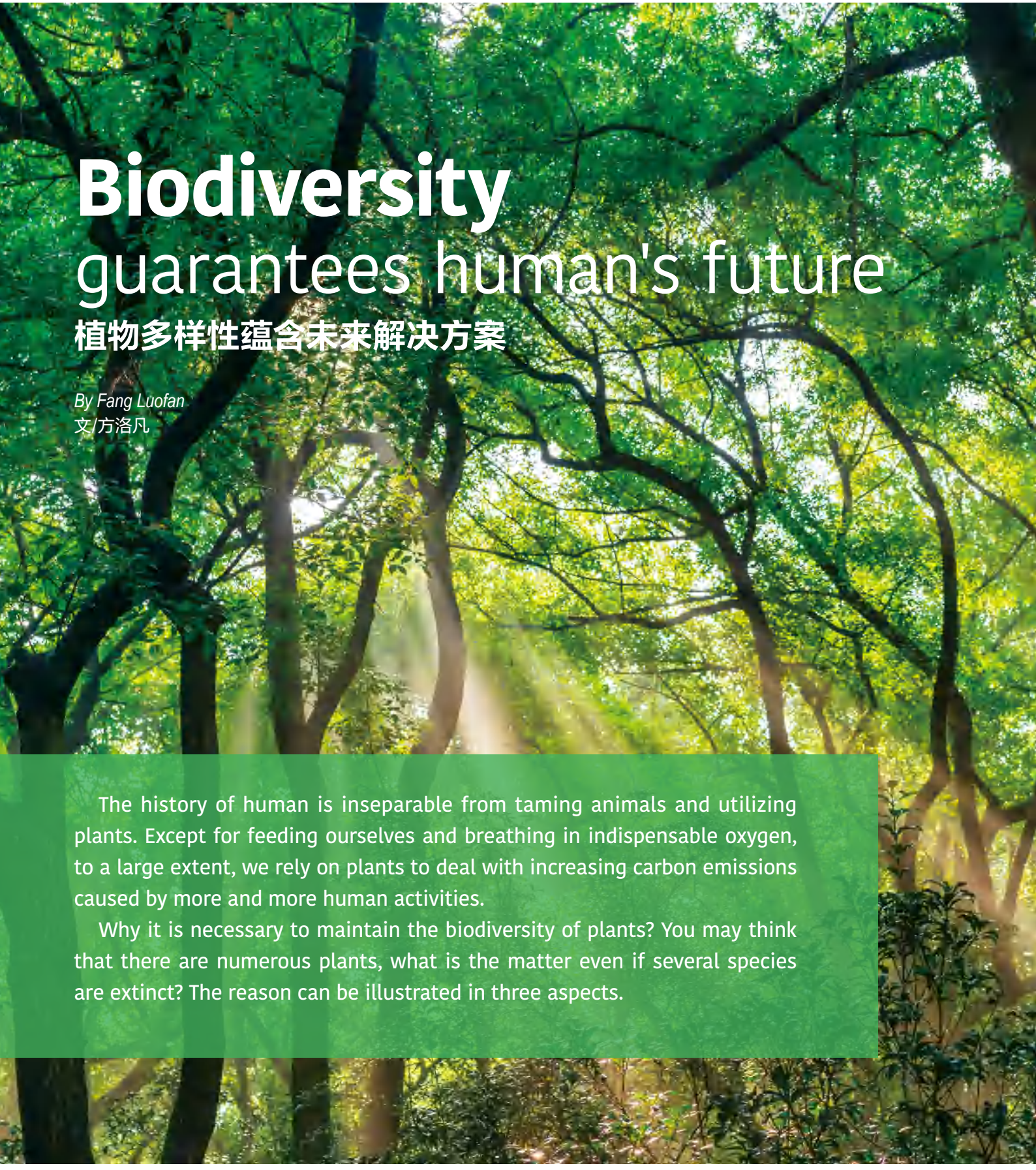


Giant pandas, serving as an umbrella species, protect species of flora and fauna in their habitats.

Panda Friendly Certification, the first of its kind, was proposed by World Wild Fund for Nature (WWF) based on its rich experience in giant panda conservation, and was released in Chengdu, capital of Sichuan in October 2018. If a product receives the certification of "Panda Friendly", it means that it is produced in the panda distribution area, contributing to panda conservation and community livelihood and meeting the requirements of sustainable development.

The surrounding areas of giant panda habitats are remote regions lack of access to transportation. Common business model utilizing large-scale resources may pose threats to the habitat and is also not sustainable. So only delicate and sustainable commercial model is suitable for these areas. The products passing the Panda Friendly Certification have both excellent quality and added value of public benefits, and the certification is expected to address the issues of protecting giant pandas and alleviating poverty in a biological friendly way, said Jean-Paul Paddack, Director of Global Initiatives of WWF.

Living in the broad forests with a profusion of vegetation, giant pandas and other species are enjoying their time without human destruction. The biodiversity in the habitats of pandas underpins human society, because there would be no human society at all without species.



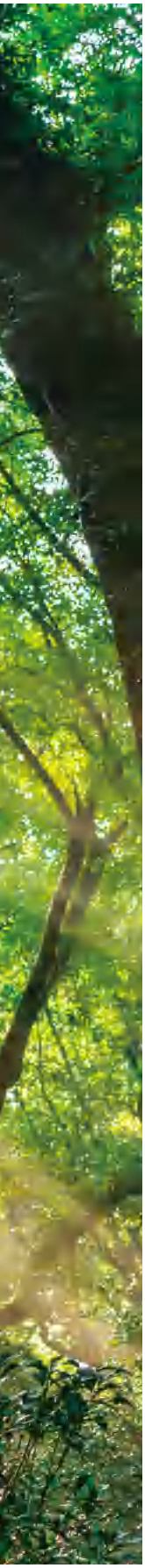
Biodiversity guarantees human's future

植物多样性蕴含未来解决方案

By Fang Luofan
文/方洛凡

The history of human is inseparable from taming animals and utilizing plants. Except for feeding ourselves and breathing in indispensable oxygen, to a large extent, we rely on plants to deal with increasing carbon emissions caused by more and more human activities.

Why it is necessary to maintain the biodiversity of plants? You may think that there are numerous plants, what is the matter even if several species are extinct? The reason can be illustrated in three aspects.



Dominoes must not fall

Biodiversity consists of genetic diversity, species diversity and ecosystem diversity. When it comes to plants, we cannot put aside any of these aspects.

Except for producing oxygen, plants play a fundamental role in ecosystems, as they absorb carbon dioxide and generate energy through photosynthesis, which are either consumed by animals, or eventually become detritus for another food chain. Without plants, the whole ecosystem will collapse.

Herbivores and some insects feed on plants, and carnivores feed on herbivores and insects. If there is a dramatically decrease of plants, it will cause massive starvation of herbivores and subsequently carnivores. Monophagous and oligophagous species feed on single or a few plant species which means the food chain is extremely vulnerable. If several food chains are broken, it will bring damage to or totally destroy an certain ecosystem.

It is easier to understand species diversity and ecosystem diversity, but what is genetic diversity? Genetic diversity refers to all genetic characteristics in the genetic makeup of species, including the number of species and the differences between species and within a species. Genetic diversity is the key to survival, as more variation brings higher possibility to adapt to environmental changes.

For example, koalas are very captious eaters, only feeding on approximately 30 kinds of eucalypts. Let's just assume that these eucalypts are close relatives and have less differences in genes. If a disease occurs, all eucalypts may be devoured because they are genetically very similar, which poses a threat to the survival of koalas as well.

In that case, protecting the biodiversity of plants equals to protecting animals and ecosystems based on these plants, which seems to be a reasonable and effective method.

Potential cure in the future

Malaria, a fatal disease caused by parasites, has taken numerous lives worldwide. However, China has resolved this problem, thanks to the efforts made by many scientists. Apart from advocating prophylactic measures, the effective cure for malaria invented by Tu Youyou and her team has saved millions of lives. This medicine is based on extract of artemisinin from green wormwood.

As a common and unimpressive member of the daisy family, green wormwood was not expected to become the specific medicine to treat malaria. We can learn from this story that perhaps the cure for current and future diseases is hiding in a humble plant growing in a corner.

Extracts from plants are widely used and can be easily found in the list of ingredients on packets of medicines, cosmetics, skincare products, detergents, etc. We must admit that protecting biodiversity of plants is saving our luck for dealing with troubles in the future. Though not every disease has a cure now, we will finally embrace the dawn with the rapid development of technologies.

Better choice for commodity circulation

We often complain that something tastes less delicious than it did a few years ago. That is not just a kind of nostalgia but a true fact.

With modern agriculture and commodity circulation, flavor is not the sole or the top consideration factor of farmers. Disease resistance, output, storage property and other elements vital to commercial activities seem to be of great importance now.

For example, in China, tomato salad is a popular home-cooked dish. Sweet, juicy and soft tomatoes match well with sugar, which is a delightful appetizer. Tomatoes tasted more like a fruit rather than a vegetable.

However, people now keep saying that tomatoes don't taste as good as before; they are sour, dry and chewy. That is because the tomatoes we buy now are different varieties. In the old days, agricultural products were grown in the ambient areas of cities, which only took short time for transportation. However, modern business mode prefers intensive production, taking longer time to reach the consumers. Therefore, most tomatoes are tougher, more suitable for long-distance transportation. Such products have higher economic benefits, as less products rot or get smashed.

This transition is realized by selecting and breeding varieties of different characteristics, which cannot be completed with limited genetic variations.

More mouths to feed, fewer plants to grow

Breeders have been working on crops with more production, stronger resistance to diseases, and characteristics catering to large-scale production. Those advantageous varieties are globally popular, producing considerable economic benefits. However, these plants squeeze the space of native species including crops.

It is a dilemma. To feed growing population, intensive high-yield monoculture turns out to be a solution, which somehow does harm to biodiversity and eventually to ourselves.

The Gros Michel banana, or known as "Big Mike", was the main variety grown globally for its outstanding characteristics until the 1950s. Gros Michel is a triploid cultivar and all its plants share the same genes, which means it can produce standardized fruits. When Panama disease, a wilt caused by a fungus, spread all over the world, it didn't take long time to wipe out Gros Michel. Finally, farmers paid a high price and abandoned this variety. Although other varieties have been bred based on the genetic pool, we can no longer savour the taste of Gros Michel.

This tragedy can happen to us again and again, as long as we promote commercial cultivation. With increasing mouths to feed, we seem to have no choice but to accept advantageous varieties. However, we must vigorously protect the biodiversity of plants, especially crops.

The China National Botanical Garden was officially inaugurated in Beijing on April 18, which is a milestone for China's protection of the diversity of plants. By integrating resources of the Institute of Botany of the Chinese Academy of Sciences (CAS) and the Beijing Botanical Garden, the Garden is expected to cover an area of 600 hectares.

The Garden has more than 30,000 kinds of plants now, and will collect the world's 5 million typical plant specimens. It is the first botanical garden in the name of the state, and serves the national biodiversity protection of plants, where conservation and breeding work will be done.

As a part of the Garden, the Institute of Botany of CAS is the top research institute on botany, which demonstrates China's firm will to protect botanic diversity. Due to climate change, habitat destruction, overdevelopment and others, many wild plants are facing extinction. However, the Garden can protect endangered plants through ex situ conservation.

The establishment of the Garden is an important part to build China's national botanic garden system. We are steadily realizing the goal of the ex situ conservation of 85% of China's wild domestic plants and all key protected wild plants.

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