

Report Stresses Need for Global Forest Restoration

By LIU Yin & ZHONG Jianli

Polar ice caps are melting rapidly and making the global sea level rise faster while the rate of global forest restoration is still lower than that of destruction. That is the warning conveyed by the *Remote Sensing Monitoring of the Global Ecological Environment Report 2023* recently released by China's Ministry of Science and Technology.

The 12th edition of the annual report includes three special reports: on the impact of global land cover change on carbon loss and absorption; the production of major grain and oil crops globally and food security; and the changes and impact of ice and snow in the polar regions and the Qinghai-Xizang Plateau, according to Zhao Jing, director of the National Remote Sensing Center and chair of the editorial board for the reports.

The report found an accelerating trend in carbon loss due to global forest changes and the expansion of impervious surface areas from 1985 to 2020, resulting in an accumulated net carbon loss of approximately 250.3 billion tons.

During the same period, annual global forest destruction increased from 121,700 square kilometers to 284,000 square kilometers, while the annual recovered forest area increased from 68,400 square kilometers to 198,900 square kilometers, remaining below the destruction rate.

Liu Liangyun, a researcher at the Aerospace Information Research Insti-



Icebergs in Greenland are melting. (PHOTO: VCG)

tute of the Chinese Academy of Sciences, said there was some progress in curbing the accelerated reduction of forested areas globally. However, he emphasized that the current efforts have not entirely met the goal of "protecting, restoring and promoting the sustainable use of terrestrial ecosystems."

Over the surveyed 35 years, global forest recovery absorbed around 9.84 billion tons of carbon, with significant contributions from South America, Africa and Asia, which accounted for about 80 percent of the total.

Nevertheless, the carbon absorbed through forest recovery could offset only around 30 percent of the carbon loss

from forest destruction.

This underscores the importance of enhancing forest vegetation restoration and improving the carbon sequestration capacity of terrestrial ecosystems by the international community to address global climate change and achieve the carbon neutrality goals.

The report also highlighted a significant shrinkage in the overall scale of sea ice in the Arctic and Antarctic and the snow cover on the Qinghai-Xizang Plateau, with the ice caps in these regions and glaciers on the Qinghai-Xizang Plateau shrinking. The deterioration of glaciers in these regions is correlated with global warming.

Despite frequent extreme events in 2023, their impact on the production of major grain and oil crops globally was relatively mild. The total production of these crops is estimated to be 2.874 billion tons, an increase of 14.14 million tons compared to the previous year, representing a growth of 0.5 percent.

Over the last 40 years, the drought resilience of major grain and oil crop-producing regions worldwide has notably improved. This can be attributed to various measures adopted in the regions, including safeguarding irrigation, using plastic mulching, conserving arable land, adjusting planting structures, and selecting drought-resistant plant varieties.

Policy

Plan to Harness Potential of Data Elements

By LI Linxu

Aiming to unlock the potential of data elements to spur high-quality development, China recently unveiled a three-year action plan on leveraging the multiplier effect of data elements.

The action plan was jointly released by 17 government bodies, including the National Data Administration (NDA) and the Ministry of Science and Technology.

As a new type of production factor, data has been quickly integrated into the processes of production, consumption, circulation, distribution and social

service management, said Shen Zhulin, deputy head of the NDA.

Through advancing the use of data in various scenarios, the action plan seeks to improve the allocation efficiency of data resources, foster new industries and patterns, and cultivate new growth drivers, added Shen.

It envisions that by the end of 2026, the application range and depth of data elements will be significantly expanded, playing a more significant role in driving economic and social development.

The projected average annual growth rate of the data industry is ex-

pected to reach 20 percent, according to the action plan.

To achieve these goals, the action plan has selected 12 sectors to promote the use of data, including industrial manufacturing, modern agriculture, commercial circulation, transport and financial services.

Sci-tech innovation, cultural tourism, healthcare, meteorological service, city governance, and green and low-carbon development are also among the selected sectors.

The action plan calls for advancing high-level opening up in the field of digital economy, strengthening internation-

al exchanges, and promoting orderly cross-border flow of data.

Efforts will be made to improve the quality of data supply, optimize the environment of data circulation and strengthen data security.

The action plan is a follow-up to a guideline on building basic systems for data, jointly released by the Communist Party of China Central Committee and the State Council in 2022.

In recent years, China has made great strides in developing its digital economy, upgrading digital infrastructure, and advancing digital technologies, laying a solid foundation to further leverage the role of data elements.

The International Data Corporation estimated China's annual data generation would reach 48.6 ZB by 2025, nearly 28 percent of the global total.

Emergency Response Robot Application High on Agenda

By CHEN Chunyou

To accelerate the development and practical application of emergency response robots (ERRs) and advance the modernization of the emergency management system, China plans to develop a series of advanced ERRs by 2025, and enhance their precision and intelligence levels, according to a guideline issued by the Ministry of Emergency Management and the Ministry of Industry and Infor-

mation Technology.

ERRs can operate semi-autonomously or fully autonomously, and can partially or completely replace humans in safety production, disaster prevention and reduction, and relief work. They can enhance the efficiency and safety of rescue operations in complex and hazardous scenarios.

Li Ying, dean of the School of Emergency Management Science and Engineering at the University of Chinese

Academy of Sciences, told *Science and Technology Daily* that the application of ERRs is a crucial indicator of China's efforts to make emergency management more scientific, professional, precise and intelligent.

In recent years, with the continuous development of technologies represented by AI, 5G and the BeiDou Navigation Satellite System, China has developed various ERRs, such as firefighting robots, earthquake rescue robots and underwater robots, all of which have been applied in real life.

"However, the application of ERRs is still in its infancy and mostly concentrated in the firefighting field. Their application in other fields is still in the stage of testing," Li said.

She said that for rapid and widespread application of ERRs, four key issues need to be addressed: core technological issues, the integration of intelligent equipment with emergency characteristics, practical applications, and the construction of an ERR ecosystem.

According to the guideline, action will be taken to establish key scenario ERR practical testing and demonstration application bases, improve the development ecosystem, and enhance the over-

all level of practical application and support for ERRs.

To achieve technological breakthroughs, measures will focus on key areas such as enhancing robots' ability to withstand harsh environments, improving their load-bearing functions and modular levels, and enhancing their control and intelligence levels, the guideline said.

To enhance emergency capabilities, various types of robots will be developed. These include reconnaissance robots for risky situations, and robots for life search, material support, firefighting and high-risk scene operations. Other areas are complex scene rescue and emergency response, construction of life passages and communication support.

"This will achieve independent and controllable high-end equipment, enhance the safety of high-risk operations, strengthen unmanned and intelligent emergency rescue capabilities for major and super major disaster incidents, and promote the transformation from direct human confrontation of disasters to a mode of reducing human involvement through relying on robots," Li said.



A robot carries out inspection near the leakage site of hazardous chemicals at Deqing county, Huzhou city of Zhejiang province. (PHOTO: VCG)

Case Study

Low-altitude Economy Booming in Shenzhen

By LI Linxu

As a well-known city of drones, Shenzhen is leading the way in development of the world's low-altitude economy.

By the end of 2023, Shenzhen had more than 1,700 drone companies, with an annual output value of 96 billion RMB, up 28 percent year-on-year, ranking first in the country, according to the latest statistics.

The city's drones are continuously gaining traction overseas. In the sector of consumer-grade drones, Shenzhen takes up 70 percent of the global market, while in the field of industrial-grade drones, it owns half of the global market share.

Besides drones, the city's low-altitude economy is also booming in low-altitude manufacturing, low-altitude flying, and integrated services, with various application scenarios such as tourism, logistics, tour-inspection, surveying and mapping.

By the end of 2023, Shenzhen had launched 126 low-altitude routes, and constructed 89 drone takeoff and landing points.

In recent years, Shenzhen has rolled out a series of policies to unlock the potential of low-altitude economy and formed a vibrant low-altitude ecosystem of industries.

In 2022, the city released a three-year implementation plan to promote the innovation and development of low-altitude economy.

The following year, developing low-altitude economy was written into the city's government work report for the first time.

Last December, the city rolled out 20 measures to support the high-quality development of low-altitude economy,

including cultivating an industrial chain, promoting sci-tech innovation, and expanding application scenarios.

This month, Shenzhen unveiled a regulation, the first of its kind in the country, to promote the industries of low-altitude economy.

The regulation covers areas including infrastructure, flying services, industrial applications, and technological innovation.

It vows to deepen international cooperation in the field of low-altitude economy, and encourages local enterprises, research institutes, and industrial associations to participate in the formulation of local, national and international standards.

Thanks to such a favorable environment, the annual output of Shenzhen's low-altitude economy is on the way to surpass 100 billion RMB soon.

The low-altitude economy has become a new driving engine of economic growth, said an official from Shenzhen Municipal Bureau of Transport, adding that the city will speed up the fostering and opening-up of low-altitude application scenarios and strive to cultivate the most diverse application scenarios in the world.



A drone works in Shenzhen, Guangdong province. (PHOTO: XINHUA)

Blueprint to Fast Track 'Beautiful China'

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To achieve the goals, it stresses the need for strengthened sci-tech support, calling for the development of green and low-carbon technologies. It proposes to build a market-oriented green technology innovation system. In addition, key national basic research plans should include R&D on pollution reduction, multi-pollutant collaborative emission reduction, climate change adaptation, biodiversity conservation, new pollutant treatment and nuclear safety.

At the same time, the guideline emphasizes expediting digital empowerment for building a "Beautiful China." This involves deepening the application

of digital technologies, constructing a digital governance system, and establishing a modern eco-environment monitoring system and a smart law enforcement system.

Significantly, the policy calls for joint efforts in building a global ecological civilization.

It proposes to adhere to the principle of common but differentiated responsibilities and promote a global environmental and climate governance system featuring fairness, rationality and win-win cooperation, while underscoring the need to deepen international cooperation on climate change, biodiversity protection, marine pollution control and nuclear safety.

Ecological Monitoring Helps Scientific Protection

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Improving protection

Ecological monitoring should not only present the status quo and changes in regional ecological environment, but also improve the ability to detect ecological damage.

"Every routine monitoring of the Gehu Lake is helpful for the optimization and adjustment of pollution prevention and control measures," said Pan, adding that the Changzhou plain water network station will adopt the integrated system to carry out regular monitoring of the region.

"For example, cyanobacteria bloom is a prominent problem plaguing the management of Taihu Lake. The monitoring station uses the monitoring data collected over the years to study the competitive growth mechanism of aquatic grasses and cyanobacteria, providing

technical support for scientific and accurate restoration of the ecological environment," said Pan.

At present, the results of ecological monitoring have played an important role in supporting the work of national ecological environmental protection supervision projects, said Jiang Huohua, director of ecological and environmental monitoring department of the MEE.

According to Jiang, the monitoring procedure will be further standardized, and data will be collected, processed and shared on a unified platform. In the next step, the MEE will set up more stations in the ecological monitoring network, to achieve broader coverage of the key and fragile areas, and provide technical support for the construction of a modern and beautiful China with harmonious coexistence between man and nature.