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NATIONAL LAUNCHING CEREMONY TO RESPOND TO INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY, WORLD ENVIRONMENT DAY AND ACTION MONTH FOR THE ENVIRONMENT 2022





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National launching ceremony to respond to International Day for Biological Diversity, World Environment Day and Action Month for the Environment 2022:

Emphasis on nature-based solutions to address global problems

On May 28th, 2022, at the Center for Culture and Sports of Ethnic Minorities of Tiên Yên Town, Tiên Yên District, Quảng Ninh Province, the Ministry of Natural Resources and Environment (MONRE) coordinated with the People's Committee of Quảng Ninh Province to organize the national launching ceremony. Việt Nam respond to the International Day of Biodiversity (May 22nd), World Environment Day (June 5th) and Action Month for the Environment 2022 to promote propaganda on policies, guidelines, policies and laws on environmental protection, messages of the United Nations to all levels, sectors and communities, creating a widespread, contributing to raising awareness on nature protection, environmental protection and biodiversity.



▲ Minister of Natural Resources and Environment Trần Hồng Hà delivered the opening speech at the launching ceremony

Need a drastic change in thinking to guarantee harmonized relationship between man and nature

Speaking at the launching ceremony, Minister of Natural Resources and Environment Trần Hồng Hà emphasized “Only One Earth” with the Central motto “sustainable living in harmony with nature” continues to be selected as theme of World Environment Day 2022. This message along with the theme “Building a Shared Future



▲ The scene of the launching ceremony



for All Life” of the International Day of Biodiversity has issued urgent orders to nations must act decisively and each of us must not forget that there is only one common “Natural Home” for species in the entire universe with billions of galaxies and billions of planets. Therefore, people need to immediately change their attitudes and behaviors towards nature, adjust the way they exploit and use resources in a sustainable way and focus on nature-based solutions to solve problems. Global issues such as climate change, health, food security, people’s livelihoods.

With high determination in action, Việt Nam is accelerating economic restructuring associated with the development of the digital economy, green economy and circular economy in order to effectively use and conserve natural resources, protect habitat. The strong declaration of net zero emissions by 2050 demonstrates Vietnam’s determination and political commitment, affirms its position and responsibility in solving serious global challenges in terms of global climate, environment, deterioration of ecosystems, towards the goal of a healthy planet. At the same time, taking advantage of the opportunities of the current trends in the socio-economic development of the country along the “green” path, realizing the goal of turning Việt Nam into a high-income developed country in 2045.



▲ Ms. Caitlin Wiesen - United Nations Resident Coordinator in Việt Nam, Chief Resident Representative of UNDP Vietnam highly appreciated Vietnam’s efforts in environmental protection

In the past time, political undertakings and commitments have been and continue to be institutionalized. In particular, the Law on Environmental Protection (LEP) 2020 was officially implemented from January 1st, 2022, with many breakthrough policies and solutions, marking a period of strong transformation in environmental protection, towards the highest goal of improving environmental quality, protecting people’s health, ecological balance, biodiversity conservation and sustainable economic development, in which, businesses and people will play a center role.

Sharing the same view with the Government of Việt Nam, Ms. Caitlin Wiesen, United Nations Resident Coordinator in Việt Nam, Chief Resident Representative of UNDP Vietnam highly appreciated the Vietnamese Government’s drastic actions since COP26, including the establishment of a National Steering Committee on the implementation of Vietnam’s cli-



▲ Delegates participated in planting trees and release fingerlings to regenerate aquatic resources in Đồng Rui Commune, Tiên Yên District, Quảng Ninh Province



mate commitments. She said, Vietnam's recently published Draft National Strategy on Climate Change is one of the important policy tools to realize the goal of net-zero emissions by 2050 and strengthen resistance and resilience for the community. The United Nations will continue to support Việt Nam in reviewing its Nationally Determined Contribution and National Adaptation Plan technical report before COP27 in November 2022. In addition, the United Nations will continue cooperate with Việt Nam in natural resource management and biodiversity conservation to protect ecosystems such as forests, wetlands and coral reefs...

Effective implementation of the Decade of Natural Ecosystem Restoration goals

Việt Nam is one of 12 biodiversity centers, one of 16 countries possessing the highest biodiversity globally with rare and precious genetic resources. However, Việt Nam is facing the degradation of biodiversity along with other great challenges such as: Covid pandemic, environmental and water resources pollution, land degradation, ocean plastic waste and the extreme effects of climate change.

On the occasion of launching the Action Month for the Environment, Minister Trần Hồng Hà proposed to the Ministries, branches and localities: (1) There is a need for a drastic change in thinking and awareness of the way sustainable living in harmony with nature; building ethics, culture and ecological civilization in dealing with nature; develop a set of criteria for culture and green lifestyle in the whole society; (2) Focusing on successfully transforming the economic structure, renewing the growth model from "brown" to "green", from intensive exploitation of natural resources to a knowledge economy, digital economy and a circular economy, low carbon; investment in natural capital; (3) Ministries, sectors, localities and businesses need to have specific plans to effectively implement the Government's commitment at COP26 on converting energy



▲ Minister Trần Hồng Hà and delegates visited the exhibition area of medicinal products to replace wild animals

from coal to clean and renewable energy; reduce greenhouse gas emissions, including methane; sustainable use of land and water resources; (4) Effectively implement the goals of the Decade of Natural Ecosystem Restoration and towards COP15 the Parties to the Convention on Biological Diversity; strongly promote the movement of the whole people to participate in the successful implementation of the program to plant one billion trees; forest protection, restoration and new planting of mangroves; raise the conservation rate in association with ecological economic development and sustainable livelihoods of the people; (5) Focus on solving environmental pollution problems in main river basins, industrial zones, clusters and craft villages; promote classification and collection of domestic solid waste at source; applying advanced technologies in recycling and solid waste treatment, gradually reducing the direct burial of waste; overcome and improve pollution and degradation of land resources; (6) Strengthening activities to prevent environmental crimes, hunting and wildlife trade; strengthen cooperation, unite the whole people, promote the role of international cooperation in solving global environmental and climate problems.

Following the national launching ceremony program, Minister Trần Hồng Hà and leaders of Quảng Ninh Province cut the ribbon to open the photo exhibition on biodiversity conservation on a shared future for all life on Earth; Visit the exhibition area of medicinal products to replace wild animals.

At the end of the program, Minister and Leaders of Quảng Ninh Province and delegates moved to Đồng Rui Commune (Tiên Yên District) to join the people in planting mangroves and release 2,000 fingerlings to regenerate aquatic resources. This place is considered as one of the areas that still retain biodiversity, with a unique ecosystem of wetlands. Given its specific characteristics, the Đồng Rui area is assessed as being eligible to meet the selection criteria of a wetland of international importance specified in the Ramsar Convention ■

NAM VIỆT



Global actions on World Environment Day underscore urgent need to protect the planet

2022 marks the 49th time World Environment Day (WED) has been celebrated. It was established following the UN Conference on the Human Environment in Stockholm in 1972 and is celebrated annually on 5th June, with a different country hosting it each year. This year's theme "Only One Earth" mirrors the theme of the first WED in 1973. It calls for collective, transformative action on a global scale to celebrate, protect and restore our planet. "Fifty years ago, the world's leaders came together at the United Nations Conference on the Human Environment and committed to protecting the planet. But we are far from succeeding. We can no longer ignore the alarm bells that ring louder every day", UN Secretary - General António Guterres said in his WED message. "The recent Stockholm+50 environment meeting reiterated that all 17 Sustainable Development Goals rely on a healthy planet", he added. "We must all take responsibility to avert the catastrophe being wrought by the triple crises of climate change, pollution and biodiversity loss".

On 5th June 2022, individuals, communities, civil society, businesses and Governments around the world marked WED, with official celebrations held in Stockholm and host country Sweden an-

nouncing a ban on issuing new licenses for the extraction of coal, oil and natural gas from 1st July this year to protect people and planet. Announcing the ban at the official WED celebrations in Stockholm, Sweden's Minister for Climate and the Environment Annika Strandhäll said "Making the green jobs of the future by accelerating the climate transition is one of the top priorities for the Swedish Government. As part of our efforts to implement our climate ambitions, we must take actions against activities that have a negative impact on our health and our environment". "Our message to the global community is clear. The winners in the global race will be the ones that speed up the transition, not the ones that lag behind and cling to a dependency on fossil fuels", she added.

Tens of millions of people around the world joined global conversations on social media demanding urgent action to conserve and restore the environment. Tens of thousands organized their own activities, including the planting of millions of trees, cleaning trash and taking actions to highlight that there is "Only One Earth".

"The triple planetary crisis is accelerating, and why? Because we consume 1.7 planets a year. We have only one Earth. We have to accept that we are not doing enough to protect it", Ms. Inger Andersen, Executive Director of the UN Environment Program (UNEP) said at the event. "I stand before you because we have to do better. We know what to do. The science has told us we have to end fossil fuels. We have to restore nature to its full glory. We have to transform our food systems. We have to make our cities green".



▲ The WED's theme calls for global actions to protect our planet

**Only One Earth**

In the universe are billions of galaxies, In our galaxy are billions of planets, But there is Only One Earth. Let's take care of it.

Earth faces a triple planetary emergency: The climate is heating up too quickly for people and nature to adapt; Habitat loss and other pressures mean an estimated 1 million species are threatened with extinction; Pollution continues to poison our air, land and water.

The way out of this dilemma is to transform our economies and societies to make them inclusive, fair and more connected with nature. We must shift from harming the planet to healing it.

Around the world, countries and communities acted on WED to make a real difference to their environments. Religious leaders came together to sign a landmark appeal on climate-responsible finance. These organizations will only engage with financial institutions that are aligned with the Paris Agreement objective of limiting global warming to 1.5° C. In India, Prime Minister Narendra Modi launched the Life Initiative to raise awareness about sustainable lifestyles.

New Zealand's Government announced on WED that the Styx Living Laboratory and partners will receive US\$ 4.12 million of jobs for Nature funding to protect the Styx River (Pūharakekenui).

Argentina has adopted the exotic invasive species national strategy, including joint management plans with Chile, while Paraguay will launch the Paraguay + Verde project to address climate change after receiving financial support of US\$ 50 million from the Green Climate Fund.

To commence on WED, Singapore's Quest Global, one of the world's fastest growing engineering services firms, announced its Quest Global Pledge - a global reforestation drive. In partnership with One Tree Planted, the firm will plant 500,000 trees globally by 2025.

In conjunction with the United Nations Association Canada, and with funding from Environment and Climate Change Canada, an official event will launch a curriculum on Indigenous Conservation across Canada. Uruguay announced that it will start participatory processes towards work on its second Nationally Determined Contributions towards the Paris Agreement goals ■

ĐỖ HOÀNG

Over the past time, environmental protection in general and solid waste management in particular directed by the Party and State have achieved many important results. Many legal documents on solid waste management have been promulgated by the National Assembly, the Government, the Prime Minister and relevant ministries and sectors such as the Law on Environmental Protection (LEP), Decrees of the Government and Circulars of Ministries guiding the implementation, the National Strategy on Integrated Solid Waste Management and the Prime Minister's Directive on a number of urgent solutions to strengthen solid waste management... The promulgation of legal documents on solid waste management in order to overcome the limitations and inadequacies in the current management, also proactively prevents and minimizes environmental pollution, creates a fundamental change in the solid waste management.

1. Solid waste management

Solid waste management can be divided into two phases: Before and after issuing Resolution No. 09/NQ-CP dated 3rd February 2019 on the Government's regular meeting in January 2019.

Before Resolution No. 09/NQ-CP is promulgated

After the LEP 2014 was promulgated, the Government promulgated Decrees guiding the implementation related to solid waste management, in which the Government's Decree No. 38/2015/NĐ-CP dated 24th April 2015 on waste and scrap management has specified waste management. On the basis of the above documents and Decrees defining the functions and tasks of the ministries, the contents of state management of solid waste assigned to many Ministries to jointly manage are specifically as follows:

- The Ministry of Natural Resources and Environment (MONRE) is responsible to the Government for the unified state management of environmental protection. For domestic solid waste, the Ministry is responsible for: Developing technical guidelines and management processes in the separation, storage, gathering, transshipment, transportation, preliminary processing, reuse, recycling, treatment and recovery of energy from domestic solid waste; Organizing the management, inspection and investigation of environmental protection activities on domestic solid waste management.



Create a synchronous legal corridor to improve efficiency of solid waste management

NGUYỄN THƯỢNG HIỀN - *Deputy Director General
Vietnam Environment Administration (VEA)*

NGUYỄN ĐỨC THỌ, ĐỖ TIẾN ĐOÀN
Department of Waste Management, VEA

- The Ministry of Construction is responsible for: Guiding the management of investment in construction of domestic solid waste treatment establishments according to the approved master plan; Method of developing, managing costs and method of pricing domestic solid waste treatment services; Publicizing economic and technical norms on collection, transportation and treatment of domestic solid waste; Investment rate of construction of domestic solid waste treatment establishments. In addition, the Ministry of Construction is responsible for organizing the elaboration and submission to the Prime Minister for approval of solid waste management master plans in key economic regions, in river basins and in interprovincial regions.

- The Ministry of Science and Technology is assigned to assume the Prime responsibility for assessing and appraising new domestic solid waste treatment technologies that have been researched and applied for the first time in Việt Nam (according to the provisions of Decree No. 38/2015/NĐ-CP on waste and scrap management). However, Government's Decree No. 40/2019/NĐ-CP dated 13th May 2019 amending and supplementing a number of articles of Decrees detailing and guiding the implementation of the LEP stipulates that the MONRE assumes the prime responsibility for and coordinates with the Ministry of Science and Technology and relevant ministries, sectors in promulgating specific criteria: appraising, assessing and publicizing domestic solid waste treatment technologies.

To fulfil the above responsibilities, the Ministries have submitted for promulgation of or promulgated legal documents related to domestic solid waste management. However, due to the interference and overlap in the state management of domestic solid waste, the organization for elaboration and promulgation of legal documents on domestic solid waste management is still limited and inconsistent, reducing the effectiveness and efficiency in domestic solid waste management.

After Resolution No. 09/NQ-CP is promulgated

In Resolution No. 09/NQ-CP, the Government unanimously assigned the MONRE as the focal point for unified state management of solid waste and at the same time assigned the MONRE to assume the prime responsibility for, and coordinate with the Ministry of Justice and relevant Ministries, agencies in urgently reviewing, amending and supplementing relevant legal documents and submitting them to competent authorities for promulgation for implementation of the plan for unified state management of solid waste mentioned above.

Immediately after that, the MONRE submitted to the Government for promulgation of Decree No. 40/2019/NĐ-CP dated 13th May 2019 amending and supplementing decrees detailing and guiding the implementation of the LEP, in which there are amendments and supplements on domestic solid waste management; at the same time, submitted to the Prime Minister for promulgation of Directive No. 41/CT-TTg dated 1st December 2020 on a number of urgent solutions to strengthen solid waste management; Directive No. 33/CT-TTg dated 20th August 2022 on strengthening management, reuse, recycling, treatment and reduction of plastic waste; Decision No. 1316/QĐ-TTg dated 22nd July 2021 on the scheme for strengthening the plastic waste management in Việt Nam; Decision No. 1746/QĐ-TTg dated 4th December 2019 promulgating the National Action Plan on ocean plastic waste management to 2030.

In particular, the MONRE advised and submitted many new mechanisms and policies on solid waste management in the LEP 2020 and guiding documents such as the Government's Decree No. 08/2022/NĐ-CP dated 10th January 2022 and the MONRE's Circular No. 02/2022/TT-BTNMT dated 10th January 2022.

2. Some new provisions on solid waste management *Domestic solid waste*

The LEP 2020 has made a fundamental and outstanding change in the provisions on payment of fees for collection, transportation and treatment of domestic solid waste in the direction of shifting from the mindset of the State to pay to entities that generate waste to self-pay. The LEP 2020 has changed the basis for determining the costs for collection, transportation and treatment of domestic solid waste by basing on the weight or volume of separated waste to calculate the costs to be paid for the collection, transportation and treatment of domestic solid waste.

In addition, the LEP also introduces a new management method by stipulating that separated domestic solid waste must be contained in certain packaging. This packaging is the basis for managing the separation and by the price of the packaging to collect the costs for collection, transportation and treatment services. Service charges for collection, transportation and treatment of domestic solid waste from households and individuals are calculated on the following grounds: In accordance with the legal provisions on prices; Based on the weight or volume of the separated waste; Solid waste that can be reused, recycled, and hazardous waste generated from households and individuals that have been separated are not required to pay collection, transportation and treatment service charges.

Currently, some people think that collecting fees for domestic waste by weight is a solution currently applied by many countries and has positive effects. However, it is still difficult to apply in our country because there must be “necessary and sufficient” conditions in terms of technical and social infrastructure. Above all, people’s awareness is still limited. Anticipating these difficulties, in the process of developing the LEP, MONRE has set a roadmap from now to 2025 as the period to propagate, raise education and awareness for the people.

To ensure enforcement according to legal provisions, households and individuals are responsible for transferring separated domestic solid waste to the designated collection points or transferring it to domestic solid waste collection and transportation establishments. Investment project owners, owners and management units of new urban areas, high-rise apartments, office buildings must arrange equipment and facilities for storing domestic solid waste suitable to waste types according to legal provisions; organize the collection of waste from households and individuals and transfer to domestic solid waste collection and transportation establishments. Domestic solid waste collection and transportation establishments have the right to refuse to collect and transport domestic solid waste of households and individuals that do not separate or do not use packaging in accordance with legal provisions and notify such to the competent authorities to inspect and handle them in accordance with legal provisions, except for cases where households and individuals use other packaging of domestic solid waste as prescribed. Establishments providing domestic solid waste treatment services are responsible for depositing when there is waste landfill; discourage investment in establishments providing domestic solid waste treatment services that only serve within a commune-level administrative unit.

In addition, residential groups, socio-political organizations coordinate with domestic solid waste collection and transportation units to guide and mo-

bilize residential communities, households and individuals to transfer solid waste to the collection, transportation units or collection points in accordance with legal provisions; supervise and publicize violations of households and individuals in the separation and collection of domestic solid waste.

Solid waste belonging to agencies, organizations, production, business and service establishments, investors in the construction and business of infrastructure in concentrated production, business and service zones, industrial clusters generated from daily-life activities and offices with a total volume of less than 300kg/day may choose the form of domestic solid waste management like households and individuals specified in Article 75 of the LEP or manage as follows: Establishments providing collection and transportation services are selected by local authorities through the form of bidding in accordance with the legal provisions on bidding; in case it is not possible to choose through bidding, it will be done in the form of ordering or assigning tasks in accordance with the legal provisions; Establishments providing collection and transportation services that are not subject to legal provisions but have a contract to transfer domestic solid waste to a transportation establishment selected by the local authority according to the provisions of Clause 1, Article 77 of the LEP... Agencies, organizations, production, business and service establishments, investors in the construction and business of infrastructure in concentrated production, business and service zones and industrial clusters are responsible for signing contracts for collection, transportation and treatment services; pay the service fees according to the service contract and according to the specific regulations of the local authority.

Circular No. 02/2022/TT-BTNMT clearly stipulates the service prices of domestic solid waste collection, transportation and treatment, including service prices applicable to organizations and individuals generating domestic solid waste (as the costs that households, individuals, agencies, organizations, production, business and service establishments, investors in construction and business of infrastructure in concentrated production, business and service zones, industrial clusters must pay for activities of collection, transportation and treatment of domestic solid waste) and service prices applicable to investors, establishments that col-



lect, transport and treat domestic solid waste (as the costs that people's committees at all levels pay to investors and establishments selected according to legal provisions to provide services of collection, transportation and treatment of domestic solid waste).

The Circular also stipulates the principles of service pricing applicable to organizations and individuals generating domestic solid waste, specifically: Service prices for collection, transportation and treatment of domestic solid waste generated from households, individuals and the subjects specified in Clause 1, Article 58 of Decree No. 08/2022/NĐ-CP shall be calculated on the principle of compensation through the local budgets; Service prices for collection, transportation and treatment of domestic solid waste generated from agencies, organizations, production, business and service establishments, investors in the construction and business of infrastructure in concentrated production, business and service zones, industrial clusters as specified in Clause 2, Article 58 of Decree No. 08/2022/NĐ-CP are calculated on the principle of correct and sufficient cost calculation for collection, transportation and treatment.

In particular, the Circular has provided guidance regarding the content of fee collection for services of collection, transportation and treatment of domestic solid waste by weight or volume of waste. Accordingly, the provincial people's committee shall decide on the form of fee collection for services of collection, transportation and treatment of domestic solid waste by weight or volume of waste in one of the following cases: Through the selling price of packaging containing domestic solid waste. The selling price of packaging includes the costs of packaging production and the costs of services of collection, transportation and treatment of domestic solid waste; Through the volume of equipment containing domestic solid waste; Through weighing and determining the weight of domestic solid waste (for agencies and organizations) or other forms prescribed by the provincial people's committee.

For the case of implementing through the selling price of domestic solid waste packaging, the Circular stipulates the technical requirements such as: Having specific specifications, designs, sizes and different volumes according to the regulations of the provincial people's committee to ensure that they are easily distinguishable from other common types of packaging. Each type of domestic solid waste packaging has different volume corresponding to different selling price; Packaging for different types of domestic solid waste has different colours; Packaging for food waste is green, packaging for other domestic solid waste is yellow. In case of necessity, the provincial people's committee may prescribe other colours to ensure uniformity and consistency in the province; Waste packaging materials must be compatible with local waste treatment technology. Encourage the use of biodegradable packaging materials; Packaging for food waste or containing food waste must ensure to avoid water leak-

age and odour emission; Packaging for domestic solid waste has an easy-to-tie and easy-to-open design, ensuring that domestic solid waste does not fall out and is convenient for inspection; Solid waste that can be reused or recycled is stored in ordinary packaging, ensuring storage capacity and not causing environmental pollution.

Hazardous waste

According to Article 83 of the LEP, hazardous waste source owners are responsible for declaring the weight and type of hazardous waste in the application for an environment license or environment registration (instead of the procedure for registration of hazardous waste source owners); Identifying, separating, collecting and storing separately and not mixing with non-hazardous waste, ensuring that it does not cause environmental pollution; Self-reusing, recycling, treating, co-treating, recovering energy in accordance with the legal provisions or transferring hazardous waste to an establishment with appropriate environmental license for treatment.

Objects permitted to transport hazardous waste include Hazardous waste source owners who have appropriate means and equipment that meet technical and management process requirements in accordance with the legal provisions on environmental protection; Establishments who are granted environment license with the function of treating hazardous waste in accordance with the type of waste to be transported. Thus, objects permitted to transport hazardous waste have been expanded, including waste source owners and establishments with environment license having hazardous waste treatment functions. Therefore, it is necessary to take management measures to ensure that the above-mentioned units comply with legal provisions and transfer hazardous waste to appropriate treatment establishments, not transfer to establishments that do not comply with legal provisions on environmental protection or even dump waste.

Establishments providing hazardous waste treatment services must meet environmental protection requirements such as those in accordance with the National Environmental Protection Master Plan or the Master Plan having hazardous waste



treatment contents; ensure a safe distance to the environment as prescribed; hazardous waste treatment technologies must be appraised; encourage the application of environmentally friendly technologies, the best available techniques, treatment technologies combined with energy recovery... The State encourages and has incentive policies for organizations and individuals participating in investment and providing hazardous waste treatment services; encourages investment in establishments providing hazardous waste treatment services at regional scale; encourages co-treating hazardous waste. Provincial people's committee organizes the implementation of the master plan on hazardous waste treatment; does not limit the collection of hazardous waste generated in other provincial-level administrative units for treatment at hazardous waste treatment service providers in the area.

A new point in the legal provisions is that some hazardous waste codes for sludge are combined into a common hazardous waste code, specifically, hazardous waste codes for sludge are 01 04 07, 02 05 01, 03 01 08, 03 02 08, 03 03 08, 03 04 08, 03 05 08, 03 06 08, 03 07 08, 04 02 04, 10 02 03, 12 06 06, 12 06 07, 12 06 08, 12 07 05 in the List of hazardous waste codes promulgated together with Circular No. 36/2015/TT-BTNMT dated 30 June 2015 replaced with hazardous waste code 12 06 05. In hazardous waste codes mentioned above, there were previously some types of ** (the types are always hazardous waste), which are now prescribed as industrial wastes subject to control. The declaration and use of hazardous waste manifests now use 4 copies instead of 6 copies as before (there are no copies sent to the Department of Natural Resources and Environment and the VEA); at the same time, the hazardous waste treatment owners (or transporters) are the entities that prepare the manifests, instead of the waste source owners.

Ordinary industrial solid waste

Ordinary industrial solid waste is classified into groups: ordinary industrial solid waste is reused, recycled as raw materials for production; ordinary industrial solid waste meeting standards, technical regulations and technical guidelines is used in the production of building materials and levelling; ordinary industrial solid waste must be treated.

Decree No. 08/2022/NĐ-CP stipulates that ordinary industrial solid waste recovered, separated, selected for reuse, is used directly as raw materials, fuel and materials for production activities managed as products and goods, and the MONRE is assigned to specify the group of wastes in the List of ordinary industrial solid waste. Accordingly, the MONRE has issued a list of hazardous waste, industrial waste that must be controlled and ordinary industrial solid waste in Circular No. 02/2022/TT-BTNMT, in which the group of ordinary industrial solid waste collected, separated, selected for reuse, direct use as raw materials, fuel and materials for production activities is denoted as TT-R.

Owners of production, business, service establishments, concentrated production, business and service zones, industrial clusters, agencies and organizations that generate ordinary industrial solid waste are responsible for separating at source according to legal provisions; storing to ensure that it does not cause environmental pollution. Ordinary industrial solid waste not separated must be managed as waste specified at Point c, Clause 1 of this Article.

Ordinary industrial solid waste containing hazardous waste that is not separated or cannot be separated shall be managed according to legal provisions on hazardous waste management. Ordinary industrial solid waste must be stored separately according to the type it has been separated; not to mix hazardous waste with ordinary industrial solid waste; do not disperse dust, leak wastewater into the



▲ The North Quảng Nam Household Solid Waste Treatment Plant



environment; store with appropriate equipment, tools and in storage areas prescribed the MONRE.

The ordinary industrial solid waste transported must be contained in equipment and tools to ensure that it does not drop, leak or spread to the environment during the transportation process, except for specific waste with large volume, which must be stored directly by equipment and containers of means of transport; Waste must be transported by type after being separated according to legal provisions; Means of transport for ordinary industrial solid waste that must be treated must have a positioning device that meets the technical requirements, operate according to the route and time prescribed by the provincial people's committee.

3. Suggestions in organization for implementation

At the Central level

In 2022, the MONRE is urgently implementing following solutions: Promulgating and publicizing the List of domestic solid waste treatment technologies recommended for application in Việt Nam as a basis for local authorities to organize the implementation; Formulating and promulgating national technical regulations on solid waste landfills and waste incinerators; Promulgating technical guidelines on waste collection and separation at source suitable to regions, urban and rural areas for implementation; Piloting activities of separating domestic solid waste at households and individuals in some localities; Developing technical guidelines for the renovation and upgrading of unsanitary waste landfills and areas contaminated by waste and minimizing environmental pollution there, meeting requirements on environmental protection; Formulating, finalizing and promulgating economic and technical norms on waste collection, transportation and treatment; Submitting to competent authorities for promulgation a Decree on sanctioning of administrative violations on environmental protection, including sanctions for violations of separation, collection, transportation and treatment of domestic solid waste.

At the local level

Effectively organize the implementation of the new provisions of the LEP 2020 and the detailed guiding documents for implementation, which emphasize the roles and responsibilities of local authorities, people and businesses; Pilot the implementation,

earlier than the roadmap prescribed by the LEP 2020 in implementing the waste separation mechanism at source; Collect service fees and charges for collection, transportation and treatment of domestic solid waste by weight and packaging in a number of major provinces and cities; Effectively implement legal provisions on extended producer and importer responsibilities, giving priority to encouraging businesses to proactively develop their own system of collection, recycling, treatment of products and packaging after treatment; Promote socialization in domestic solid waste management, especially in encouraging investment in the construction and operation of domestic solid waste treatment establishments, apply the domestic solid waste collection, transportation and treatment model in accordance with the legal provisions on environmental protection and investment in the form of public-private partnership (PPP) to ensure the effectiveness, stability and sustainability of the project, promote and diversify resources for waste treatment; Increase investment in infrastructure and develop human resources: local authorities need to arrange land fund for domestic solid waste treatment zones, allocate sufficient funds for investment in construction and operation of domestic solid waste collection, storage, transfer, transportation and treatment systems in the area.

District-level people's committees promulgate according to their competence, programs and plans on domestic solid waste management; Organize the implementation of strategies, programs, plans and tasks on domestic solid waste management; Organize the implementation of activities of separating domestic solid waste at source according to legal provisions.

Commune-level People's Committees inspect the compliance with the legal provisions on environmental protection in the collection and transportation of domestic solid waste; Handle violations on domestic solid waste management according to their competence; Consider and settle petitions and complaints of organizations, residential communities, households and individuals related to the collection and transportation of domestic solid waste; Assume the prime responsibility and coordinate with domestic solid waste collection and transportation establishments, residential communities, and socio-political organizations at the grassroots level to determine the time, place, frequency and route of domestic solid waste collection; Instruct households and individuals to transfer domestic solid waste to the collection and transportation establishments or to the collection points in accordance with legal provisions; Guide the residential community to monitor and publicize cases of non-compliance with legal provisions on separation and collection of domestic solid waste; Formulate plans or contents of implementing domestic solid waste management in the area ■

Provisions on environment protection of natural heritage in the Law on Environmental Protection and guidelines

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In order to solve and prevent the risk of imbalance, exceeding the tolerance threshold of ecosystems, degrading the value of natural landscapes and the goal is to fill the gap in the provisions of current laws on management of negative impacts of socio-economic development on nature and biodiversity and at the same time contribute to the protection, development and sustainable use of natural heritage (NH) on the basis of ecosystem's values and services, the Law on Environmental Protection (LEP) in 2020 and its guiding documents have prescribed the content of NH objects, management and environmental protection of NH to represent comprehensive picture of the environment, connecting environmental components to serve the state management of environmental protection, nature and biodiversity conservation nationwide

The contents of environmental management and protection of NH are built on the basis of reviewing the provisions of relevant laws and international treaties that Việt Nam has signed (CBD Convention, Ramsar Convention), World Heritage Convention, UNESCO) and practical requirements, ensuring compliance with the general policy of the Party and Government on enhancing environmental protection, conserving nature and biodiversity in parallel with socio-economic development, decentralization of management according to localities for localities as well as characteristics of NH according to geographical territories. These regulations not only create an important legal basis to protect and preserve the core values of nature, create favorable mechanisms for investment, exploitation and sustainable use of natural resources on the basis of the ecosystem approach, developing natural capital, but also contributing to promoting the value of ecosystem services for the country's socio - economic development.

1. Regulations on NH

NH is determined according to the provisions of Clauses 1, 2, Article 20 of the LEP in 2020 and Clauses 1, 2, 3, Article 19 of Decree No. 08/2022/NĐ-CP dated January 10th, 2022 in order to ensure the consistency of a system of NH areas nationwide that should be prioritized for resources to manage, protect the environment, conserve nature and biodiversity. In which, recognizing existing objects in practice and supplementing and stipulating objects that have not been mentioned in the current legal system. Specifically:

- *NH is an object that has been established under other laws:* National parks, nature reserves, species and habitat conservation areas, landscape protection zones, estab-

lished landscapes and landscapes and manage according to the provisions of the Law on Biodiversity, Forestry and Fisheries, Cultural Heritage (Point a, Clause 1, Article 20 of the LEP).

- *NH recognized by international organizations:* World NH; world biosphere reserve; global geopark; wetlands of international importance (Ramsar site); ASEAN Heritage Park (AHP) and NH recognized by international organizations (Point b, Clause 1, Article 20 of the LEP).

- *Other NH* is an area established and recognized under the provisions of Point c, Clause 1, 2, Article 20 of the LEP and Clauses 1, 2, 3, Article 19 of Decree No. 08/2022/NĐ-CP. Accordingly, other NHs include the following three objects: biosphere reserves, geoparks and other areas that meet one of the criteria specified in Clause 2, Article 20 of the LEP and Clause 2, Article 20 of the LEP and Clause 1 Article 19 Decree No. 08/2022/NĐ-CP dated January 10th, 2022.

Thus, the regulation of objects of NH recognized by international organizations and other NHs, especially biosphere reserves, geoparks, has contributed to perfecting the legal corridor on managing and protecting these objects in current practice.

2. Establishment and recognition of other NH

The establishment and recognition of other NH specified in Clauses 4, 5, 6 and 7, Article 19 of Decree No. 08/2022/NĐ-CP. Accordingly:

- *Provincial NH:* Provincial-level people's committees (people's committees) shall organize the formulation of projects on establishment, appraisal and recognition of provincial level NH sites in their respective management areas.

- *National NH:* Provincial-level people's committees organize the construction of projects on establishing national NHs in the province for management and send them to the Ministry of Natural Resources and Environment (MONRE) for appraisal and submission to the Prime Minister for recognition.



3. Nomination for recognition of a NH recognized by an internationally recognized organization

The order and procedures for nomination for recognition of NH recognized by an international organization for the first time are fully systematized in Article 20 of Decree 08/2022/NĐ-CP and create a clear legal corridor in the nomination and recognition of national NH objects to become NHs recognized by international organizations such as: World biosphere reserve, global geopark, Ramsar site, AHP...

Accordingly, the provincial people's committee shall send the dossier of nomination of NHs to become NHs recognized by international organizations to the MONRE for appraisal and submission to the Prime Minister for approval of the nomination policy. On the basis of the Prime Minister's approval, the MONRE coordinates with the Ministry of Foreign Affairs and the people's committee of the province to complete and submit the nomination dossier for recognition according to the regulations of each international organization for each title of NH.

4. Investigation and assessment of NHs

The NHs are investigated and evaluated (according to Clause 1, Article 21 of Decree No. 08/2022/NĐ-CP) in a complete and comprehensive manner according to environmental factors, compositions and developments, nature and biodiversity, contributing to timely assessment of impacts on NH components to take appropriate measures to manage and protect the environment to minimize negative impacts on core values of NH. At the same time, the survey results are reported to the provincial people's committees and updated into the national biodiversity database according to the provisions of Clause 2, Article 21 of Decree No. 08/2022/NĐ-CP and Clause 3 of Article 21. 8 Circular No. 02/2022/TT-BTNMT dated January 10th, 2022.

5. Regulations on grouping, classification and zoning of NH

Grouping, decentralization and zoning of natural heritages have been prescribed in Clauses 3, 4, 5, Article 21 of Decree No. 08/2022/NĐ-CP on the basis of inheriting the current legal system and ensuring its integrity at national level on natural heritages according to their size, value and importance to be protected in order to allocate investment resources to manage, protect and promote the value of NH for the sustainable development of the country. Specifically:

a) NH groups including: group of important natural and ecological landscape heritage (objects of valuable NH in terms of natural and

ecological landscapes); heritage group of high biodiversity value (NH objects with biodiversity value); group of important ecological environment heritage (NH objects with environmental value); group of NH parks (group of NH objects containing more than 2 criteria from the above groups) (Clause 3, Article 21 of Decree No. 08/2022/NĐ-CP).

b) Classification of NH is carried out on the basis of the size of the area, the scope of influence, the meaning and importance of the values of nature in order to ensure resources for the protection, conservation and effective management of the unified NH with the current legal system (laws on biodiversity, forestry, fisheries, cultural heritage stipulate the classification of NH objects at provincial and national levels). Particularly for the Law on Cultural Heritage, there are special national level relic regulations. Therefore, the NH classified according to the provisions of Clause 4, Article 21 of Decree No. 08/2022/NĐ-CP includes:

- Provincial NH: Provincial nature reserve; scenic spots are provincial relic; important wetlands at provincial level; biosphere reserves, geoparks and other NHs specified in Article 19 of Decree No. 08/2022/NĐ-CP established and recognized by the people's committee of the province;

- National level NH: national level nature reserve; scenic spots are national relic; nationally important wetlands; biosphere reserves, geoparks and other NHs specified in Article 19 of Decree No. 08/2022/NĐ-CP recognized by the Prime Minister;

- Special national level NH (nominated for recognition on the basis of NH at provincial and national levels): scenic spots are special national level relics; World NH; world biosphere reserve; global geopark; Ramsar site; heritage parks and NH sites recognized by international organizations.

c) Zoning of NH including core zone, buffer zone, transition zone and specific location, area and boundary defined in Clause 5, Article 21 of Decree No. 08/2022/NĐ-CP. The NH zoning aims to delineate the areas with core values that make up the NH and the surrounding areas, adjacent to the NH for a suitable sustainable development way in accordance with each zoning, ensuring harmony between nature and people, between the goal of environmental protection and socio-economic development.

- Core zone is an area containing core values according to the criteria of establishing and recognizing NH and effectively managed and protected, including: Nature reserve; protected area I of scenic spots; areas with core values that need to be preserved intact, preserving the pristine natural features of biosphere reserves, geoparks and other NHs specified in Articles 19 and 20 of Decree No. Decree No. 08/2022/NĐ-CP. In which, the core zone is a nature reserve, which is functionally divided according to

the provisions of the Law on Biodiversity, Forestry and Fisheries, including strict protection zone, ecological restoration zone and administrative service zone.

- Buffer zones, including: areas with value to be protected at a lower level than the core zone of the NH; protected area II of scenic spots and areas adjacent to the boundary of the core zone have the effect of preventing and mitigating negative impacts of socio-economic development activities outside the NH on the core zone of NH.

- Transition zones, including areas associated with buffer zones, where socio-economic development activities take place, need to be controlled in consistent with and harmonized with the protection and conservation objectives of the establishment and recognition of NH.

In addition, the core zone of the NH is regulated as a strictly protected area and the NH buffer zone belongs to the emission-restricted zone according to the regulations on environmental zoning in Article 22 of Decree No. 08/2022/NĐ-CP.

6. Regulations on organization of NH management

The organization of NH management has been clearly defined, ensuring compliance with the guidelines, policies and laws of the State and at the same time creating an important legal basis for localities to mobilize resources and implement effective management activities of NH in the area.

a) Requirements for management boards or organizations managing NH:

Management boards or organizations managing NH must meet the criteria of environmental protection and management capacity (which can be understood as factors in terms of number of human resources, professional qualifications and professional skills, elements of material and technical foundations for the management and protection of the environment of NH). At the same time, they are responsible for organizing, mobilizing forces and resources, managing and protecting the environment of NH, approved regulations and plans; organize the monitoring and timely prevention of acts of infringing upon NH; organizing ticket sales, collection of entrance fees and services; manage and use revenue sources as prescribed by Law; propaganda to raise awareness and participation of the community in the protection and management of NH; participate in the management, association and supervision of

investment activities, environmental protection, nature conservation, biodiversity in NH areas; perform other tasks assigned by competent agencies (Point b, Clause 6, Article 21 of Decree No. 08/2022/NĐ-CP).

b) Establish a management board or assign an organization to manage NH

The establishment of a management board or assignment of a NH management organization is specified at Points b, c, d, Clause 6, Article 21 of Decree No. 08/2022/NĐ-CP and the practical conditions of each locality in order to effective management of NH, environmental protection, nature and biodiversity conservation. Accordingly:

- For the world biosphere reserve and global geopark located on a large area, with production areas and residential areas, the provincial people's committees shall establish an interdisciplinary management board and ensure resources for operation. To take action to manage and protect the environment, conserve nature and biodiversity in accordance with this Decree and relevant laws (Point b, Clause 6, Article 21 of Decree No. 08/2022/NĐ-CP).

- NH in the area of 1 province or centrally run city: in case the NH is a nature reserve or scenic spots, a management board is established or an organization is assigned to manage NH in accordance with the provisions of the Law on Biodiversity, Forestry, Fisheries and cultural heritage. In case the NH has nature reserves or scenic spots managed by different management boards or assigned to different organizations to manage, the provincial people's committees decide to arrange or assign only a management board or an organization that has the capacity and ensures resources to manage that NH. Or the people's committee of the province shall decide on the model of the management board or assign the organization to manage the NH in accordance with the practical conditions of the locality. (Points c, d, Clause 6, Article 21 of Decree No. 08/2022/NĐ-CP).

- In case the NH is located in the area of 2 or more provinces or centrally-run cities or is located in unidentified sea where the administrative management responsibility of the provincial people's committee has not been determined, the MONRE shall submit the Prime Minister decides an organizational model that manages or merges or assigns a management board or assigns an organization to manage that NH (Points c, d, Clause 6, Article 21 of Decree No. 08/2022/NĐ-CP).

c) Requirements on formulation of regulations and plans on management and environmental protection of NH (Point a, Clause 6, Article 21 of Decree No. 08/2022/NĐ-CP):

Responsibility for approving regulations and plans: Provincial-level people's committees organize the formulation and approval of regulations and plans on environmental management and protection of NH located in the province according to the form specified in Article 9 of the Circular No. 02/2022/TT-BTNMT;



The MONRE shall organize the formulation and approval of regulations and plans on management and environmental protection of the NH for NHs located in two or more provinces or centrally run cities or on the sea area has not yet determined the administrative responsibility of the people's committee of the province.

For NHs that already have management regulations and plans before Decree No. 08/2022/NĐ-CP takes effect, the competent authority shall approve regulations, plans. Such management plan is responsible for integrating and updating the contents as prescribed in Decree No. 08/2022/NĐ-CP into its regulations and plans in according with the provisions of the Law on Biodiversity, Forestry, Fisheries and Cultural Heritage within 6 months from the effective date of Decree No. 08/2022/NĐ-CP.

7. Regulations on environmental protection of NH

The content of environmental protection of NH has been specified in Article 21 of the LEP and Clause 7, Article 21 of Decree No. 08/2022/NĐ-CP with the following basic requirements:

- Environmental protection of NH is a content of the National Environmental Protection Planning, regional planning and provincial planning.

- Agencies, organizations, residential communities, households and individuals have the responsibility to protect NH. Organizations, residential communities, households and individuals participating in the management and protection of the NH environment shall enjoy benefits from payment for natural ecosystem services in accordance with Law.

- Production, business and service activities in the core zone of the NH shall be controlled as for the strictly protected area and in the buffer zone of the NH is controlled as for the restricted emission zone according to the provisions of the LEP;

- The natural ecosystems in the NH must be prioritized to preserve and restore the natural status quo; contaminated or degraded NH land and water environment must be rehabilitated and restored;

- The core values of nature and biodiversity of the NH must be protected and preserved intact; natural ecosystem services of NH must be maintained, developed and used sustainably;

- The specific indicators of geology, landscape, ecology and biodiversity of the NH must be investigated, evaluated, monitored, supervised, inventory and report according to regulations;

- Comply with other requirements on environmental protection, prevention and control of impacts on the environment, biodiversity of NH as prescribed in Decree No. 08/2022/NĐ-CP, regulations provisions of relevant laws and regulations of international treaties on environment and biodiversity that Việt Nam has signed.

The responsibility for environmental management and protection of the NH is specified in Clause 8, Article 21 of Decree No. 08/2022/NĐ-CP, in which the MONRE helps the Government implement unified management and protection of the environment of NH; elaborating, promulgating and submitting to promulgate legal documents; organize the implementation, inspection and examination of the observance of the Law and provide technical guidance on the management and protection of the environment of NH. Provincial level people's committees level shall uniformly manage and protect the environment of NH in their respective management areas and Ministries, and ministerial-level agencies are responsible for organizing the implementation of requirements on environmental protection of NH in accordance with regulations of the Law.

8. Regulations on resources for environmental management and protection of NH

Decree 08/2022/NĐ-CP, Articles 21, 3 and 6 stipulating the "priority of resources" for nature conservation, biodiversity, environmental management and protection of NH; at the same time, specified in Chapter XI. Resources for environmental protection are as follows:

- Expenses for environmental non-business activities (Article 153, Clause 1, Point a): Investigate, survey, evaluate, manage and protect the environment of the NH; establishment, appraisal and recognition of NH; support the management and environmental protection of NH zones under the responsibility of the Central Government (Article 151) or the tasks of the locality (Article 152).

- Other sources of expenditure (expenses for economic activities, expenditures on science and technology, investment in development...) are specified specifically for other activities of conservation of nature and biodiversity in Article 153 for activities at the Central level (Article 151) and at the local level (Article 152).

In addition, Article 21, Clause 6, Point b stipulates that the management board or organization assigned to manage NH: may allocate resources from the state budget for activities of management and

protection of the heritage environment, natural products; organizing ticket sales, collection of entrance fees and services...; Article 21, Clause 7, Point e stipulates: MONRE and provincial people's committees shall organize the formulation and approval of projects on environmental restoration of polluted and degraded NHs in accordance with the Law on State Budget.

People's committees actively implement the contents under their authority and at the same time propose the contents under the Central management responsibility according to the provisions of Decree No. 08/2022/NĐ-CP.

In order to promote the implementation of regulations on environmental management and protection of NH, MONRE issued Official Letter No. 1225/BTNMT-TCMT dated 11/3/2022 on organizing the implementation of content on management of NH. Environmental management and protection of NH in the LEP and Decree No. 08/2022/NĐ-CP, which was sent to all provincial people's committees.

Thus, the regulations on NH in the legal system on environmental protection have contributed to completing the extremely important legal corridor for resource management, nature conservation and environmental protection. Việt Nam, demonstrating the determination of the State in the process of sustainable development of the country, without sacrificing the environment and nature, enhances the effectiveness of nature conservation and promotes the value of nature for socio-economic development of the country. Ministries, sectors and localities, based on the provisions of the LEP, Decree 08/2022/NĐ-CP and Circular 02/2022/TT-BTNMT to organize the implementation according to their assigned functions and tasks. The process of implementing regulations on NH, ensuring inter-sectoral coordination between Central and local agencies; ensure resources (human and financial) to carry out investigation, assessment, management and environmental protection of NH according to practical requirements ■

On January 28th, 2022, the Prime Minister issued Decision No. 149/QĐ-TTg approving the National Strategy on Biodiversity to 2030, with a vision to 2050 (hereinafter referred to as Strategy). The Strategy sets a target by 2030 to increase the area of natural ecosystems that are protected, restored and to ensure their integrity and connectivity; Biodiversity is conserved and used sustainably in order to contribute to socio-economic development in the direction of a green economy, proactively adapting to climate change. The Strategy also sets out the main contents, tasks and key solutions to be implemented in the period from now to 2030. In the general context of the situation of biodiversity being degraded at a high speed, it is necessary for all sectors and levels to take drastic actions in implementing the key tasks of the Strategy in order to achieve the proposed objectives.

Increase the area of natural ecosystems that are protected and restored and ensure the integrity and connectivity of natural ecosystems

The Strategy sets out the goal that by 2030, the area of nature conservation zones (NCZs) will reach 9% of the land area; the area of protected sea and coastal areas accounts for 3 - 5% of the national natural sea area; 70% of NRs and natural heritages are assessed for management effectiveness; the national forest coverage rate remains stable from 42% to 43%; recover at least 20% of the degraded natural ecosystem.

Currently, terrestrial NCZs only cover nearly 7% of the land area, while marine protected areas only cover about 0.185% of the marine area. Most of the NRs have an area that is not large enough, lacks connections and does not guarantee habitat conditions for the development of many wild species, especially large mammals. The expansion of protected areas, in addition to promoting the establishment and management of new protected areas, also focuses on expanding the area of existing protected areas, establishing biodiversity corridors to increase connectivity between NCZs. In addition to the expansion and establishment of new NCZs and biodiversity corridors, the Strategy also sets out tasks for consolidating and improving the management capacity of NCZs, continuing to apply the co-management model in areas where NRs are managed in appropriate areas, establish a mechanism to evaluate the effectiveness of the management of conservation areas and natural heritage areas, develop and implement investment policies for natural heritages, change jobs and support livelihoods for people living in the buffer zone; consolidating and expanding natural areas of international importance such as world biosphere reserves, Ramsar site, ASEAN heritage parks, world natural heritages. In addition to the natural resources and biodiversity corridors, the application of effective conservation measures in areas outside the NR system with high biodiversity value and important wetlands are considered as new priorities in NCZ system in the next period. Continue to restore degraded important natural ecosystems, priority is given to mangrove, coral, seagrass, and high-diversity ecosystems.



Major tasks of the National Strategy on Biodiversity to 2030, vision toward 2050

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Conservation and restoration of endangered wild species

Strategies to identify targets for effective conservation of wild species, especially endangered, precious and rare species prioritized for protection and migratory species; by 2030 no more wild species will become extinct; improve the population status of at least 10 endangered, precious and rare species prioritized for protection and at least 3 species prioritized for protection successfully bred and released, 100% of endangered precious and rare species prioritized for protection are included in the management and monitoring plan in NCZs and areas of high conservation value.

These are ambitious goals, given the growing threats to endangered wildlife. To accomplish these goals, the Strategy has set out specific tasks to strengthen in-situ and ex-situ species conservation, including the development and implementation of a conservation program for wild, endangered, precious and rare species prioritized for protection; promote research on conservation and reintroduction, protect habitats, expand and strengthen the capacity of rescue centers, develop conservation breeding facilities, botanical gardens...

Strengthen the conservation of genetic resources, manage access to genetic resources, share benefits and protect traditional knowledge about genetic resources

In order to achieve the goal by 2030 that at least 100,000 wild genetic resources and plant and animal varieties will be preserved and conserved, the main tasks

include: Strengthening the investigation, collection and preservation genetic resources of endangered wild species, forest trees, medicinal plants, plants, domestic animals and wild relatives of plant varieties, domestic animals and microorganisms in gene banks; take measures to conserve precious, rare, endemic and endangered wild genetic resources and traditional knowledge on genetic resources; capacity building and promotion of the implementation of the Nagoya Protocol on access to genetic resources and benefit sharing.

Promoting the benefits of biodiversity for sustainable development, disaster prevention and adaptation to climate change

The key groups of tasks include: investigation, inventory, statistics, assessment and building of a national database on biodiversity; sustainable use of biodiversity and ecosystem services; conservation and development of urban and rural biodiversity; biodiversity conservation and adaptation to climate change. The contents of biodiversity conservation in agriculture, forestry, fishery and tourism sectors are emphasized and at the same time, the conservation and development of urban and rural biodiversity are highlighted according to the ecological and social system approach, taking people as the center to bring long-term

welfare to people and society are new points of the Strategy. Sectors also play an important role in biodiversity conservation through strengthening incentives to develop biodiversity-friendly products, eliminating subsidies harmful to biodiversity, including incentives for economy; economic reform towards sustainable development and green growth.

Some specific tasks are prioritized for implementation in this period, including implementation of payment mechanism for wetland and marine ecosystem services, development of sustainable



▲ Authorities release wild animals into the forest

nature-based tourism, development of bio-trade market for biodiversity-friendly products, implement adaptation solutions based on nature and community knowledge, and increase the capacity to absorb greenhouse gases; applying knowledge of local people in conservation and sustainable use of biodiversity, ensuring sustainable livelihoods.

Control activities that have negative impacts on biodiversity

The current rate of change and degradation of biodiversity has been determined for many reasons, especially impacts from human development activities: land and sea use; direct exploitation of organisms; generating waste causing environmental pollution; introduction of invasive alien species... The task in the coming period is to continue to strictly control the activities of changing land use purposes, forests, water surface, unsustainable farming and exploitation methods and activities that pollute environment; control illegal exploitation, captive breeding, trade and consumption of wild animals and plants; prevent, strictly and effectively control invasive alien species; strengthen biosafety management of genetically modified organisms. Among the implementation measures, the good implementation of the impact assessment of the natural landscape and biodiversity in the environmental impact assessment, strategic environmental assessment is one of the key measures to protect biodiversity from impacts of economic and social development's activities.

The Strategy assigns the Ministry of Natural Resources and Environment (MONRE) to assume the prime responsibility for and coordinate with Ministries, branches and localities in organizing the implementation of the Strategy; develop and submit to competent authorities for approval and effectively organize a number of assigned programs, schemes and projects; formulating and organizing the implementation of a program on communication and awareness raising on biodiversity; develop and guide the application of management standards for NCZs and natural heritage areas and implement a program to evaluate management effectiveness; establish a Partnership Forum between the MONRE and organizations on biodiversity and ecosystem services to share information, create opportunities for cooperation and coordinate actions to enhance conservation effectiveness and sustainable use of biodiversity; guiding the development of action plans and communication programs, raising awareness on biodiversity at the provincial level; check the implementation of the Strategy; organize a preliminary review of the implementation of the Strategy in 2025 and a summary in 2030.

Ministries and branches shall, according to their functions and tasks, perform key tasks under their management responsibilities, develop and organize the implementation of programs, schemes, projects and tasks in accordance with the objectives and content of the

Strategy. The people's committees of the provinces and centrally-run cities shall request the provincial-level People's Councils to allocate funds for performing the tasks assigned to their localities from the local budgets according to current regulations on decentralization of the state budget; mobilize and use resources provided by the Central Government and other resources to implement the Strategy; direct the development and implementation of the Provincial Biodiversity Action Plan in 2022; developing and implementing program on communication and raising awareness on biodiversity at the provincial level in line with the objectives and contents of the Strategy and the actual situation of the locality. The Strategy also recommends socio-political organizations, social organizations, socio-professional organizations to actively participate in and supervise the conservation and sustainable use of biodiversity under their management responsibility; encourage organizations and individuals to participate in activities of conservation and sustainable use of biodiversity and ecosystem services.

For the Strategy to be successfully implemented, sectors, levels and communities need to have a deep awareness of the importance and urgent current needs to prevent biodiversity loss and live in harmony with nature; consider biodiversity as an important natural capital which is foundation for contributing to ensure sustainable development of the country; biodiversity conservation is one of the effective solutions to protect the environment and adapt to climate change; thereby carefully considering the contents of biodiversity conservation in the process of planning and implementing policies, approving investment projects and clearly defining the responsibilities of different levels, sectors and local authorities on biodiversity conservation; encourage and ensure the equal participation and rights of people and communities, especially the private sector, in the process of making and implementing decisions related to the conservation and sustainable use of biodiversity.

In addition, it is necessary to implement synchronous solutions to improve policies, laws, management institutions and strengthen the capacity of Law enforcement on Biodiversity; promote scientific research, development, transfer and application of advanced technologies in biodiversity conservation and sustainable use; ensure financial resources for biodiversity conservation; strengthen international integration and cooperation on biodiversity conservation and sustainable use ■



Some urgent solutions for conservation of migratory wild birds in Việt Nam

In order to prevent and stop hunting and destroying the habitats of wild and migratory birds, on May 17th, 2022, the Prime Minister issued Directive No. 04/CT-TTg on some urgent tasks and solutions for the conservation of wild and migratory birds in Việt Nam. The issued directive has an important meaning, contributing to strengthening the protection and development of migratory wild birds and affirmed that Việt Nam is a country with high responsibility for the implementation as member of the international commitments.

Areas of migratory wild birds create important natural values

Việt Nam is considered as one of the most important areas in the flyway network of migratory and endemic bird, with 63 globally important bird zones and 7 endemic bird zones. Wild and migratory bird areas have created important natural values of Việt Nam, contributing to nature and biodiversity conservation, at the same time developing socio-economic, tourism and building a beautiful image of Việt Nam.

Birds play an important role in ensuring the functioning of ecosystems, directly affecting human health, the economy and food production. They eradicate pests by consuming 400 - 500 million tons of insects per year, pollinators of plant species and nearly 5% of these species used by humans for food and medicine, making an important contribution to the flora on earth from dispersal of seeds, maintaining the balance and connect terrestrial and aquatic ecosystems. Stops of wild and migratory birds are important for nature and biodiversity conservation and are important indicators for assessing ecosystem health and environmental and climate change.

In Việt Nam, more than 900 bird species have been recorded, of which 99 need conservation attention, 10 critically endangered species, 17 endangered species, 24 endangered species and 48 endangered species. According to the investigation of scientists, Việt Nam is a destination for more than 301 migratory bird species and a stopover for many migratory waterfowl species in the Australia - East Asia Migratory Waterfowl Flyway. This route spans 22 countries and is a migratory route for tens of millions of individuals of more than 150 species of waterfowl, including the most threatened species compared to other routes (more than 80 species of waterfowl), typically red-crowned cranes, spoon-bills, spoon-billed sandpiper... are endangered species which are included in the protection program of the region and the list of priority species for protection of our country.

Việt Nam has soon joined the Convention on Biological Diversity (CBD) and other international treaties to protect components of biodiversity such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora. (CITES), the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (the Ramsar Convention) and the East Asian-Australasian Flyway Partnership (EAAFP).



▲ Xuân Thủy National Park (Nam Định Province) is the home to many rare birds

In recent years, the relevant policy and legal system has been paid attention to perfecting to meet the requirements of preventing and dealing with complicated developments of illegal hunting, trading and consumption of wildlife such as the promulgation of laws on: Biodiversity, forestry, fishery as well as guiding documents. In addition, the Prime Minister has also promptly issued directing documents such as Directive No. 28/CT-TTg dated September 17th, 2016 of the Prime Minister on a number of urgent solutions to prevent and fight against illegal acts of wildlife abuse and Directive No. 29/CT-TTg dated July 23rd, 2020 of the Prime Minister on a number of urgent solutions for wildlife management.

However, the hunting and consumption of wild birds, especially migratory birds, is serious in many localities, negatively affecting biodiversity, the environment and there is potential risk of disease. In addition, hunting, catching and destruction of natural habitats are the cause of the decline in the number and composition of wild and migratory birds. As a result, some migratory birds no longer appear during the bird migration seasons to Việt Nam.

Urgent tasks and solutions to conserve wild and migratory birds

To conserve wild and migratory birds; prevent and stop hunting, catching and destroying the habitats of wild and migratory birds, at Directive No. 04/CT-TTg, the Prime Minister requested Ministries, functional branches and localities to take the following measures:

Establish a system to monitor the important flyway of migratory birds

Ministry of Natural Resources and Environment (MONRE) reviews, proposes to perfect, submit for promulgation and promulgate according to its authority the regulations on conservation of wild and migratory birds in Việt Nam; guide the management and protection of wild and migratory birds; guide and organize the implementation of management and protection activities for wild and migratory birds, including the protection of habitats, transboundary migration routes and their stopping points. At the same time, coordinate with relevant countries and international organizations to strengthen the protection of wild birds, migratory and transboundary routes, important migratory birds and their stopping points in Việt Nam; Assume the prime responsibility for and coordinate with concerned Ministries and branches in, directing, propagating, guiding and inspecting the effective implementation of this Directive.

Strictly handle acts of hunting, catching and trading wild birds

The Prime Minister requested the Ministry of Agriculture and Rural Development to direct forest rangers to coordinate with local authorities and relevant agencies in the area to strengthen patrols, control, prevent, arrest and strictly handle acts of illegally

hunting, catching, killing, raising, confining, transporting, trading, processing, storing and consuming wild and migratory birds, especially in the migratory season (from September of the previous year to April of the following year). Strengthen coordination with MONRE, people's committees of provinces and centrally run cities and relevant agencies in the management of important wildlife and migratory areas of Việt Nam; review and coordinate with relevant agencies to propose, supplement and complete legal provisions on sanctions and penalties for violations of hunting, shooting and trapping wild and migratory birds; strengthen monitoring and timely detect diseases and epidemics originating from wild and migratory birds that are at risk of spreading, affecting the health of humans, livestock and poultry.

The Ministry of Public Security directs the environmental police force to strengthen measures to fight, prevent and strictly handle violations of the Law on Hunting, Killing, Raising, Confining, Transporting, trading and processing, possession, consumption of migratory and wild birds; directing functional forces to strengthen investigation, detection and timely handling of violations, especially dismantling lines of illegal trading, stockpiling and transportation of wild birds and animals transnational immigration.

The Ministry of Industry and Trade directs the market management force to assume the prime responsibility for, and coordinate with relevant specialized agencies in, strengthening the management and timely handling of illegal business activities, transportation, storage and consumption of wild and migratory birds; directing and implementing measures to inspect and handle illegal forms of advertising and online business on wild and migratory birds and tools for trapping and catching birds (nets, traps, components for assembling homemade guns, shotguns...

The Ministry of National Defence directs functional forces to strengthen patrols and strictly control at border gates and border crossings to promptly detect, arrest and handle cases of illegal purchase, sale transportation, import and export of wild and migratory birds according to Law provisions.

The Ministry of Finance directs the customs force (especially customs force at the border gate) to be proactive and coordinate with quarantine units to strengthen inspection and control of trade, illegal transportation of wild birds which migrate cross-border.



▲ *Black-tailed gulls (top) and Caspian terns during a long journey from the North to the South, from the end of September, began to appear on the coast of Cần Giờ (Hồ Chí Minh City)*

Strengthen propaganda on wildlife protection laws

The Ministry of Information and Communications directs media agencies to increase reporting and broadcasting of messages, reports and bulletins propagating the law on wildlife protection, especially wild and migratory birds; propagandize people not to participate in illegal activities of killing, catching, raising, confining, transporting, trading, processing, storing and illegally consuming wild and migratory birds and products thereof; direct and strictly control advertising activities of products and tools for hunting, catching and trapping wild and migratory birds (nets, hunting rifles, home-made guns...).

The people's committees of the provinces and cities directly under the Central Government shall strengthen the direction and implementation of relevant legal provisions in their respective localities; organize the management, protection and sustainable development of nature reserves, wetlands, bird parks, bird sanctuary and important bird areas in locality; organize the implementation for business establishments in the area to sign commitments not to buy, sell, use, consume, display and ad-

vertise wild animal specimens that do not have legal origin and strictly handle individuals and businesses that commit violations. Directing local authorities at all levels and Law enforcement agencies to strengthen control, prevent and strictly handle acts of hunting, catching, trapping, slaughtering, transporting, trading, processing, illegal possession of wild, migratory birds; organize the complete destruction of markets, places for trading wild birds and illegal migration in the area. Enhance propaganda and avocation of people not to hunt, catch, trap and shoot wild and migratory birds; not buy, sell, transfer, trade, store or illegally consume wild and migratory birds; strictly observe the provisions of the Law on Biodiversity Conservation, Protection of Endangered Precious and Rare Species prioritized for protection; actively fight and denounce violators of the Law on Management and Protection of Wild and Migratory Birds...

In summary, the Directive has requested Ministries, branches and people's committees of provinces and centrally run cities to implement synchronously, focusing on urgent solutions to conserve wild and migratory birds in Việt Nam, including continuing to improve the legal corridor, strictly complying with legal regulations, communication, raising awareness, strengthening international cooperation, taking specific measures to protect wild, migratory birds and their habitats, contributing to environmental protection and sustainable development ■

NGUYỄN HẰNG

Some issues about the orders and procedures for claiming compensation for environmental damages

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1. Types of damages caused by violations of the legal provisions on environmental protection

According to the provisions of Article 130 of the Law on Environmental Protection (LEP) 2020, there are two main types of damages caused by environmental pollution.

a. *Damages caused by impairment of the functions and usefulness of the environment.* These are general environmental damages such as: damages to protected natural species and habitats (any damage that has material adverse effects on the attainment or maintenance of favorable conservation status of the habitats or species); damages to water (damages that negatively affect ecological, chemical, quantitative, ecological potential status); damages to soil (contamination of soil creates threats, risks to human's health, microorganisms, organisms living in the soil or on the ground...); damages to air, noise, vibration, radiation, temperature, light, odors.

b. *Damages to human's life, health, property and legitimate interests of organizations and individuals* caused by impairment of the functions and usefulness of the environment. That can be damages to life (environmental incidents cause people to die), health (toxic gases make people sick and with diseases; toxic substances cause birth defects), property (property swept away by flood, property damaged by acid rain, fish dying from contaminated water...). They may be damages that the victims are specifically identified (individuals, group of individuals or an organization being harmed: due to the damages to human's life, health or property).

Thus, about the subject of damages, damages from violations of the legal provisions on environmental protection can be divided into two main categories: damages to identifiable victims and general damages to the environment (the general public or the public interest is compromised).

Usually, violations of the legal provisions on environmental protection cause these two types of damages. For example, Vedan's act of discharging untreated wastewater has caused

crop damages (damages to property, economic benefits) to farmers in Hồ Chí Minh City, Đồng Nai Province and Bà Rịa - Vũng Tàu Province, but at the same time caused damages to aquatic species in the river (general damages to the natural environment - public property that is often difficult to identify specific victims).

2. Types of orders and procedures for settlement of compensation for environmental damages

Because there are two types of damages as analyzed above, the orders and procedures for settling a claim for environmental damages include the following two types of procedures:

2.1. *Orders and procedures for claiming compensation for damages due to impairment of the functions and usefulness of the environment according to the provisions of Article 113 of Decree No. 08/2022/ND-CP dated 10th January 2022 include:*

- a) Notice of environmental damages.
- b) Receipt of the notice and consideration of the settlement authority.
- c) Checking and verification of information
- d) Identification of organizations and individuals causing environmental pollution or degradation.
- e) Organization for collection and appraisal of data and evidence to determine damages to the environment and claim compensation for environmental damages:
 - e.1. Self-implementation or hiring a suitable and functional unit to implement.
 - e.2. Establishment of an appraisal council.
 - e.3. Making a claim based on the results of the due diligence.
- f) Settlement of compensation through negotiations between the parties. If it is not possible to negotiate, then choose to settle through the following forms:
 - f.1. Reconciliation.
 - f.2. Settlement of compensation through arbitration.
 - f.3. Settlement of compensation by Court.

2.2. *Orders and procedures for claiming compensation for damages to human's life, health, property and legitimate interests of organizations and individuals caused by violations of the legal provisions on environment shall comply with the following steps:*

- a) Recognizing environmental damages
- b) Requesting the competent authority to settle
- c) Initiating a lawsuit to the Court to claim compensation for damages. Orders and procedures for initiating lawsuit at court shall comply with the provisions of the Code of Civil Procedure (Figure 1).



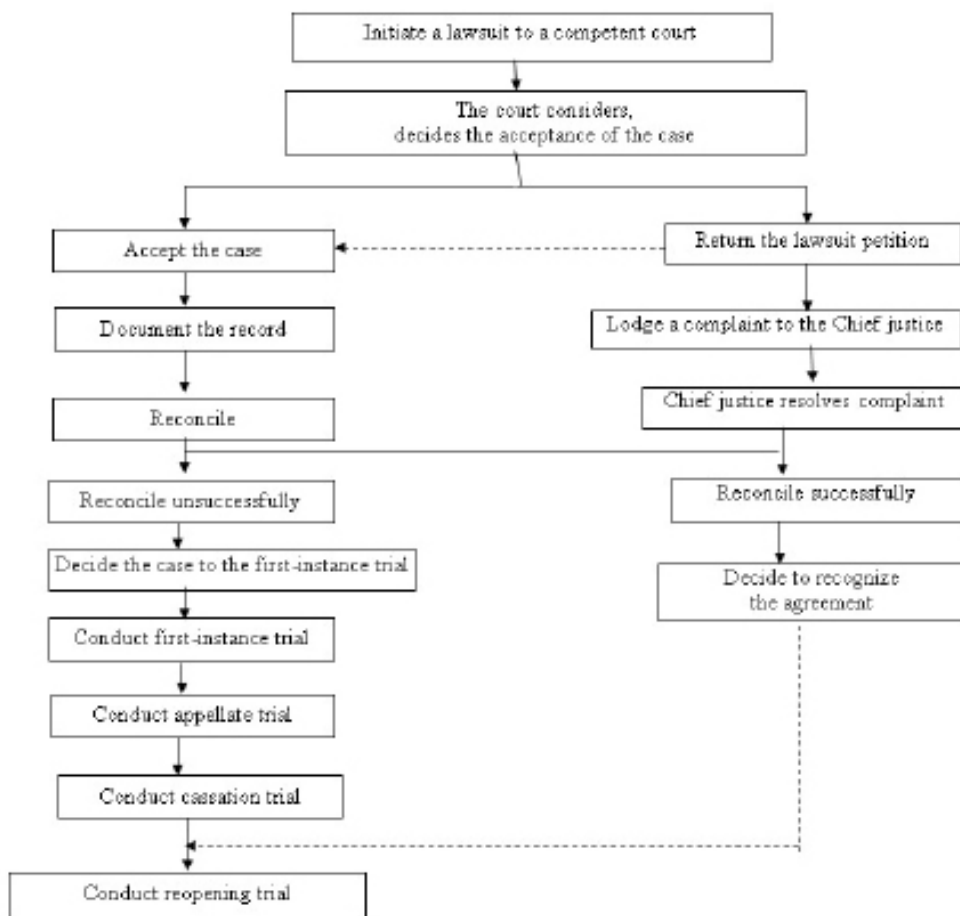
According to the current legal provisions, victims of violations of the legal provisions on environmental protection with specific damages to human's life, health, property and other legitimate rights and interests can initiate a lawsuit at the court for settlement according to the provisions of Articles 35, 39, 40, 184 and 189 of the Code of Civil Procedure 2015 and guiding documents.

After the claim for compensation for damages is accepted by the Court, damage compensation cases usually have to go through many procedures such as pre-trial reconciliation procedures, first-instance

trial procedures, most cases only really ended after there was an appellate trial. Many cases, even after an appellate trial, can be reviewed and resolved according to cassation or reopening procedures. After the Court's judgment has taken effect, if the indemnifying party does not voluntarily pay compensation, the indemnified party may request the intervention of civil judgment enforcement agencies to take necessary measures (including coercive judgment enforcement measures).

2.3. Through the study of the above two orders, procedures, we draw some similarities as follows:

- The objective of the two procedures is to require the damaging subject to pay compensation for the damages caused by his/her acts;
- Negotiation and reconciliation between the damaging party and the damaged party is a very necessary procedure and cannot be taken lightly;
- Collecting information, data and evidence to protect one's own legitimate rights and interests is the responsibility and obligation of the parties involved;



▲ Figure 1. Orders and procedures for a lawsuit and trial in Court

- The damaging subject and the damaged subject of the above two procedures can collect information, data and evidence by themselves or hire a consulting unit to do to protect their own legitimate rights and interests;

- Procedures for initiating lawsuits to request a competent court to settle according to the legal provisions on civil procedures and civil judgment enforcement procedures (if any);

Besides, these two procedures have the following differences:

- The petitioners claiming compensation for damages to human's life, health, property and legitimate interests of organizations and individuals caused by violations of the legal provisions on environment include individuals, groups of individuals, legal entities.

- The petitioners claiming compensation for damages due to the impairment of the functions and usefulness of the environment have only legal entities (commune-level people's committees, district-level people's committees, provincial-level people's committees and the Ministry of Natural Resources and Environment (MONRE)).

- Funds for damage determination and implementation of procedures for compensation for environmental damages to human's life, health, property and legitimate interests of organizations and individuals due to violations



of the legal provisions on the environment shall be paid by individuals, groups of individuals and legal entities;

- Funds for carrying out the procedures and orders for claiming compensation for damages due to the impairment of the functions and usefulness of the environment shall be paid by the State. In case of winning a lawsuit against an organization or individual causing environmental damages, they must pay all costs (Clause 2, Article 130 of the LEP 2020);

- In the course of carrying out the orders and procedures for claiming compensation for damages due to the impairment of the functions and usefulness of the environment, proving the cause-and-effect relationship between violations of the legal provisions on environment and damages occurred is under the responsibility of the violating organizations or individuals, causing environmental pollution. (Clause 2, Article 133 of the LEP 2020).

- The establishment of a Data and Evidence Appraisal Council to review, appraise and evaluate the collected data and evidence, in order to determine and calculate damages to the environment is a mandatory requirement during the settlement of the procedures for claiming compensation for damages caused by the impairment of the functions and usefulness of the environment (Point 6, Clause 4, Article 113 and Article 114 of Decree No. 08/2022/NĐ-CP dated 10th January 2022).

3. Solutions contributing to the effective implementation of orders and procedures for claiming compensation for environmental damages:

3.1. For the orders and procedures for claiming compensation for damages due to the impairment of the functions and usefulness of the environment, the following solutions should be implemented:

- To proactively have funds to hire a unit with appropriate functions and capacity to collect data and evidence, determine liability for compensation for damages; to calculate the damages to the environment due to pollution and degradation, State agencies need to arrange funds or get from the funding sources of the Central and local Environmental Protection Funds for the unit responsible for claiming compensation for damages and determining damages to the environment according to the provisions of Article 131 of the LEP 2020.

- According to the provisions of Decree No. 08/2022/NĐ-CP, the MONRE and people's committees at all levels are competent to claim compensation for damages caused by the impairment of the functions and usefulness of the environment within the scope of their management. In fact, it is not clear which agency will be responsible for presiding over and assisting the MONRE and people's committees at all levels to carry out this activity (that is natural resources and environment agency, judicial agency or any other agency?). Therefore, it is necessary to clearly define which agency performs this task.

- Difficulties in collecting documents proving violations of legal provisions on environment such as waste assessment samples and conclusions of environmental in-

spection agencies; expert agencies' conclusions on violations; minutes of dialogue between the parties on dispute settlement; minutes of violations or decisions on administrative penalties for environmental violations such as: Discharging wastewater, dust, smoke, causing noise in excess of permitted standards, that was forced to take remedial measures such as: Ban the discharge of untreated wastewater into the environment; for the above cases, if the disputing parties do not agree on the settlement of violations or compensation for damages, they must conduct an assessment or re-assessment. However, the damage assessment, appraisal and re-assessment are often very complicated, requiring highly specialized knowledge, high implementation costs and it is difficult to ensure the timeliness in claiming for compensation for damages.

- Difficulties in choosing a method to settle a claim for compensation for damages: According to the provisions of Article 133 of the LEP 2020, when there is damage from a violation of the legal provisions on environmental protection, the damaging party and the damaged party have the right to negotiate with each other. In case of failure to negotiate, the parties can choose to resolve the issues such as: (1) Reconcile; (2) ask arbitration to resolve; (3) initiate a lawsuit in court. Therefore, it is necessary to pay attention to this issue in the future. It is possible to use arbitration in practice. However, this content has not yet been specifically guided by the Law.

3.2. For the orders and procedures for claiming compensation for damages to human's life, health, property and legitimate interests of organizations and individuals caused by violations of the legal provisions on environment, apply the following solutions:

- According to the provisions of Clause 3, Article 131 of the LEP 2020, organizations and individuals suffering damages to human's life, health, property and legitimate interests due to the impairment of the functions and usefulness of the environment implement by themselves or authorize other state agencies, organizations and individuals to determine damages and claim compensation for damages to the environment in accordance with legal provisions. To implement this content, in the coming time, the competent authorities need specific guidance.

- The exemption, reduction or non-advance of procedural costs is of great practical significance when the victims of environmental pollution are mainly people in rural areas with low income. This is an important factor for them to decide whether to sue or not after having suffered damages due to environmental pollution ■



Promoting ethical BioTrade in the world and in Việt Nam

TẠ KIỀU ANH

Nature and Biodiversity Conservation Agency, VEA

Currently, consumers are increasingly interested in healthy products, including products derived from nature. Therefore, more and more companies have been established with aim to exploit natural materials. To ensure sustainable exploitation of natural resources, it need an innovative and ethical exploitation systems.

Biodiversity is the natural capital for a green and sustainable economy, balanced between economic growth and biodiversity conservation. The sustainable collection, production and trade of products from biodiversity is important. The BioTrade Initiative was launched in 1996 by the United Nations Conference on Development and Trade. BioTrade refers to the collection, production and trade of goods and services derived from indigenous biodiversity according to environmental, social and economic sustainability criteria. BioTrade products are being used in industries such as food, cosmetics, pharmaceuticals, sustainable tourism. By 2016, BioTrade was deployed in 22 countries in Africa, Asia and Latin America. As of 2016, BioTrade has benefited 5 million people around the world. Carrying out BioTrade activities also contributes to the preservation of the knowledge, practices and traditional cultures of indigenous peoples and local communities. By creating economic values, BioTrade is also a driving force behind the protection of resources from biodiversity. Socially, compliance with BioTrade's principles requires fair sharing of benefits and respect for human rights and workers' rights.

Ethical Bio Trade Standard was launched in 2007 and was developed based on the principles and criteria of the United Nations Conference on Trade and Development's Biodiversity Trade Initiative. BioTrade identifies practices that respect child's people and biodiversity in a raw way from biodiversity grown, harvested, studied, research, processing and commercialization. BioTrade is the core of the Union for Ethical BioTrade (UEBT). UEBT envisions a world in which people and biodiversity both thrive. To achieve this vision, UEBT regenerates biodiversity and secures a better future for humanity through the ethical procurement of biodiversity-sourced materials.

Since 2009, UEBT has been conducting surveys to measure how consumers' awareness and understanding of biodiversity affects consumers' purchasing decisions. During 10 years of research, about 68,000 people from 16 countries and hundreds of leading companies provide valuable information that can guide companies and Governments in their approach to people and biodiversity. According to 2019 research, Asian consumers have a

growing awareness of biodiversity and expect companies to take more responsibility for biodiversity protection. A majority of Asian consumers surveyed find that companies have an ethical obligation to ensure their manufacturing practices have a positive impact on people and biodiversity, and that Asian consumers also express more confidence in products with sourcing commitments certified by independent organizations.

Principles of BioTrade

Biodiversity conservation: This principle provides a framework of practice for maintaining, regenerating and increasing biodiversity, applied depending on the context. The principle requires an assessment of the local situation and consistent with local practice. These practices are implemented not only limited to exploitation sites, but also include broader areas. Accordingly, the activities that need to be done are to collect information on biodiversity in the exploitation area; Implement specific activities to maintain, regenerate or enhance biodiversity in exploitation areas; Implement and periodically adjust specific activities to ensure relevance and continuous improvement.

Sustainable use of biological diversity: This principle promotes and encourages practices of sustainable exploitation and use of biodiversity, which may include organic farming practices. Principle-based practices that take into account key components of biodiversity as well as species and genetic diversity. These practices also extend to land, water and air resources within the exploitation areas. Practices that apply exclusively to the purpose of growing or harvesting will be specifically addressed in each locality such as adopting good practices to ensure use sustainably exploited species and prevent or minimize negative impacts on other species; Exploitation practices promote resilience to climate change; soil and water conditions are preserved or improved in the exploitation area; adopt good practices to prevent and minimize the negative effects of agricultural chemical use; take measures to improve energy efficiency and reduce waste and pollution in the exploitation area.



Fair sharing of the benefits from the exploitation and use of biodiversity: This principle promotes long-term relationships and pays the price reasonable for producers – local collectors or smallholder farmers picking or cultivating plants used for natural materials. Original principles ensures that activities contribute to the needs of local development in the exploitation areas. Furthermore, it promotes compliance legal requirements and good practice on access to genetic resources and benefit sharing (ABS). Accordingly, this principle ensures that the price paid for natural materials is reasonable; Agreements are based on dialogue and trust and long-term co-operation; support local development needs, the needs of producers and the exploitation community. In addition, the use of natural materials complies with the applicable legal requirements on ABS; if no legal requirements apply on ABS, the use of genetic resources and associated traditional knowledge from indigenous peoples and local communities should respect the principles of ABS.

Sustainability in socio-economic development: This principle promotes the integration of relevant requirements in BioTrade, in organizational activities, organization and management systems, including quality and traceability systems. The contents of this principle include: BioTrade is promoted through organizational activities and management system; Availability of resources to carry out BioTrade activities; Quality system in line with market requirements; Have a traceability system in place with market, certification and regulatory requirements.

Compliance with national and international regulations: This Principle promotes and facilitates compliance with the principle's rules, laws and regulations relating to the cultivation, collection, supply, research, processing or commercialization of natural materials. Principles that define certain national laws and regulations, as well as international agreements, which are particularly relevant to BioTrade

practice. Accordingly, the activities respect the laws and regulations applicable to and in connection with BioTrade activities; activities that respect international agreements related to BioTrade activities need to be secured.

Respect rights of parties involved in BioTrade activities: This principle promotes respect for human and worker rights and working conditions along the supply chain, taking into account conventions relevant International Labor Organization (ILO) and legal frameworks nation. Principles focus on respecting rights at the corporate level members of UEBT, as well as in farming and harvesting activities (local manufacturers and processing companies).

Transparency in land use rights, access to knowledge and natural resources: This principle identifies practices that respect rights to land and natural resources, in particular those relating to land and natural resources, indigenous peoples and local communities in the exploitation areas. Accordingly, disputes over ownership or use land and natural resources are settled; The traditional rights and practices of Indigenous peoples and local communities are respected; Natural farming and harvesting activities does not jeopardize food security local.

Promoting BioTrade in Việt Nam

Việt Nam is one of the countries with high biodiversity in the world with more than 13,200 terrestrial plant species, 10,000 animal species and 3,000 aquatic species. With increasing world demand, these natural materials extracted from bio-resources have great economic potential, especially in high-end markets where customers are willing to pay higher prices for their products which are produced sustainably and ensure fair trade. BioTrade offers promising opportunities for Việt Nam. BioTrade was introduced



▲ Hòn Yến Island (Phú Yên Province) - a perfect site for sight-seeing and coral diving



in Việt Nam in 2012 and as of 2019 more than 8,000 people have benefited. Economically, BioTrade creates jobs and incomes for people, especially farmers, collectors and local communities. The BioTrade project in Southeast Asia is funded by the Swiss Federal Bureau of Economic Affairs as of 2019 and is implemented by HELVETAS Vietnam and the Center for Rural Economic Development (CRED). In which, HELVETAS is responsible for project management in countries: Laos, Myanmar and Cambodia. CRED is responsible for the project implementation in Việt Nam.

During the period 2016 - 2020, the project of Ethical BioTrade in the pharmaceutical industry has been implemented, in which the main partners are 12 small and medium-sized herbal medicine manufacturers; Ministry of Health (Institute of Medicinal Materials - NIMM); Ministry of Science and Technology; Ministry of Natural Resources and Environment; people's committees of provinces. The overall objective of the BioTrade Project is: "Promoting Việt Nam to become an internationally recognized exporter of natural ingredients in which natural materials are sustainably sourced, produced and traded in accordance with The International Convention for the Conservation of Biological Diversity (CBD) and the Principles of BioTrade". The BioTrade project has attracted the participation of a large number of people and local authorities, management agencies, relevant Ministries and research units in Việt Nam, especially promoting the role of pharmaceutical enterprises as a leading factor in the value chain. At the supply chain, businesses and local communities are trained and understood in the principles of growing and harvesting medicinal plants according to sustainable standards. Currently, three value chains have been assessed to be able to announce the application of good practice standards for growing and harvesting medicinal herbs according to the guidance of the World Health Organization (GACP WHO), which are: *Polyscias fruticosa*, *Phyllanthus urinaria* and *Gymnema sylvestre*. In addition, the participants self-assessed their product development strategy, completed the value chain to have a sustainable production (economic, social, environmental), facilitated in trade promotion activities, global integration.

In the period 2020 - 2024, the regional bio-commercial project (phase II) implemented, in which the main partner is the

Ethical Biotrade Organization (UEBT); Business support organizations (national and provincial associations, trade promotion organizations, certification consulting companies); Sustainable value chain experts, capacity building consultants, small and medium enterprises (SMEs); Non-governmental organizations (NGOs) working in the field of biodiversity, national and international media agencies. The overall goal of the project is "Conserve biodiversity through sustainable trade in products from biodiversity in a way that integrates local exporters/producers into global value chains and enhances higher incomes of people in rural areas whose livelihoods depend on biodiversity resources in the Mekong River region".

The project has promoted trade promotion activities for the natural raw material industry; Strengthening management capacity and business processes for SMEs (building business strategy, marketing, planning to go to market and finance); Supporting SMEs through sustainable value chain consulting services to build efficient supply chains and target low-income audiences; Communicate BioTrade awareness and influence policy makers to integrate BioTrade into environmental, economic and trade policies.

By the efforts of both domestic and international enterprises and organizations, in recent years, natural resources have been promoted. Many regions across the country have gradually formed large material areas that have become trademarks such as artichoke and *Ampelopsis cantoniensis* growing areas in Lào Cai; cinnamon in Yên Bái; anise in Lạng Sơn; Azollaceae in Bắc Giang; kumquats, *Polyscias fruticosa* and *Gymnema sylvestre* in Nam Định; gac, centella in Nghệ An; Hibiscus, *Eclipta prostrata*, *Phyllanthus urinaria*, *Passiflora foetida*, *Glinus oppositifolius* in Phú Yên, turmeric in Đắk Lắk... bring in hundreds of millions VND in revenue per hectare for farmers. The source of clean raw materials that ensure strict quality standards after being harvested will be taken to a network of connected factories to conduct the extraction of medicinal substances, serving the domestic production of medicinal herbs and bringing them to the international market.

Thus, the BioTrade Project has contributed to the formation of the necessary factors to create a new market, an opportunity for the innovation of the pharmaceutical industry and sustainable natural ingredients. Achieving the Project's goals requires a transformative change in method of consumption and production, in which the private sector will necessarily play a central role. This creates a strong impetus for the parties involved in the implementation of the Post - 2020 Global Biodiversity Framework.

In the future, the Project can support the integration of biodiversity conservation and sustainable use into interdisciplinary or inter-sectoral or inter-sectoral plans, programs and policies. It is a tool through which parties can encourage collaboration between Government agencies and the private sector in the development of sustainable practices ■



Improve the efficiency of handling violations of legal provisions on wildlife protection in the Central Highlands

LÊ ANH XUÂN

Việt Nam Lawyers Association

The Central Highlands is considered to be the paradise of wild species in Indochina, where there are diverse ecosystems, concentrated with many species of flora and fauna, especially endemic species, precious and rare, endangered species having high conservation value. It is the richness of species that makes this area one of the hot spots for illegal wildlife hunting and trade.

Violation situation and difficulties in wildlife trade prevention and control

The Central Highlands region consists of 5 provinces (Kon Tum, Gia Lai, Đắk Lắk, Đắk Nông and Lâm Đồng), with a total natural area of 5.46 million hectares, accounting for 16.8% of the country's area, with about 5.6 million people. The Central Highlands is one of the regions having great biodiversity value in Việt Nam with many precious and rare species of flora and fauna such as Asian elephants, gray-shanked douc langurs, civets. According to statistics of the Forest Protection Department of Region IV, currently in the region there are 1,253 wildlife farms and establishments with the number of 58,302 individuals (216 establishments have been granted codes). In which, there are 34,562 individuals of precious, rare and endangered wild animals; 22,510 individuals of common animals; 32 individuals of bears and 1,188 individuals of other species.

However, the nature of the Central Highlands is being seriously damaged and degraded under the influence and exploitation of humans. In recent years, the situation of wildlife transportation, trade, rearing, confinement, hunting and catching in the Central Highlands region has been increasing and complicated. Statistics of violations of the legal provisions on wildlife protection show that, from 2016 to the first 3 months of 2022, there were 266 cases, confiscating more than 316 individuals, of which 16 are precious and rare. Regional WWF internal research reports show that populations of ungulates and tiger's pray in the Mondulkiri Special-use Forest bordering Bình Phước, Đắk Nông, Đắk Lắk and Gia Lai have decreased by more than 70% over the past 40 years, there has been the involvement of illegal cross-border trade through these provinces.

Though, the number of wildlife violations prosecuted in court and ended in criminal convictions is still modest, this is not commensurate with the

fact that the number of violations is detected, and wildlife species are severely reduced in special-use forests located in the Central Highlands provinces. In the period from 2020 to now, the whole Central Highlands region has had 69 violations, of which 40 cases have been handled, with 36 cases being administratively sanctioned and 4 cases being prosecuted for criminal liability (prosecuted two cases/one defendant). Also, during this period, Đắk Nông Province had the highest number of violations with 38 cases of illegal wildlife hunting and trade; the total number of cases handled was 34, of which 30 cases were administratively sanctioned and 4 cases were criminally handled. These figures show that only 5% of the total violations have been prosecuted in court and no case has been ended in criminal convictions to date. It can be seen that the efficiency of the legal system in handling and preventing violations of wildlife protection is not strong enough to deter and warn violators, causing a serious decline in wildlife populations in the Central Highlands, especially the border areas with Laos and Cambodia.

Along the border with Laos and Cambodia, the provinces of Kon Tum, Gia Lai, Đắk Lắk, Đắk Nông, Bình Phước are home to nearly 4 million people with 47 ethnic groups, their lives depend significantly on forest resources, including wildlife. Due to a lack of understanding of the legal provisions and motivated by the consumer market for specialty bushmeat dishes, illegal wildlife hunting and trade still occurs, especially in remote and mountainous areas where many ethnic minorities reside.

In the process of Law enforcement on wildlife protection, Law enforcement agencies in the Central Highlands region are still limited in detecting and promptly handling violations of endangered, precious and rare wildlife because restaurants have taken advantage of open regulations in the development of breeding, confinement of common animals that mutate, mix and consume meat of wildlife species with domesticated animals of all kinds. There are many reasons for this to happen, of which the main reason is that wildlife trade brings huge profits, so the subjects operate



extremely sophisticatedly, ready to fight back law enforcement officers to escape when discovered. The wildlife transporters and traders are usually hired to transport to receive wages; when detecting and capturing material evidences and means of violations, most of the goods owners cannot be found. Therefore, it is not possible to handle the leading subjects of wildlife transportation and trade.

In addition to the difficulties in controlling illegal wildlife hunting and trade by local communities, forest protection forces in the Central Highlands also face obstacles in law enforcement on wildlife management and protection. The legal system on wildlife conservation is basically complete, but it is still overlapping and inconsistent, causing many difficulties for forest protection officers to understand and correctly apply the issued regulations. Forest protection officers are responsible for managing and protecting wild species, but in fact most of them have not received specialized training in wildlife management and protection. Therefore, they have difficulties in identifying species and status of species in the process of detecting, investigating and handling violations. Such reasons can lead to the risk of omission of criminals or applying inappropriate punishments.

Recommendations

Currently, Việt Nam has signed and became a member of the CITES and the Criminal Code 2015 (amended and supplemented in 2017) stipulates two articles (Article 234 and Article 244) related to wildlife crimes with a maximum prison term of up to 15 years or a maximum fine of 5 billion VND for individuals and 15 billion VND for legal entities. With this strict provision, the Criminal Code is said to be a solid legal instrument to handle wildlife crimes. In addition, many legal documents guiding the implementation to handle violations of legal provisions on protection of wildlife, endangered, precious and rare animals have been issued in order to implement the

recommendations of the international treaties to which Việt Nam is a member as well as to meet the work of fighting and handling crimes related to violations of legal provisions on the protection of wildlife, endangered, precious and rare animals.

However, fighting and handling violations of legal provisions on protection of wildlife and endangered, precious and rare animals by Law enforcement agencies are sometimes not strict and timely, so the number of cases detected and handled not many, the punishment level is still light, not enough deterrent for prevention and education. Regarding the assessment work, in most provinces there is no assessment organization (assessor), only a few provinces have judicial expertise on a case-by-case basis, leading to some cases requiring quick assessment results to handle but no results, thus prolonging the time to resolve cases. The scientific assessment (DNA) must be brought to the Institute of Ecology and Biological Resources, Việt Nam Academy of Science and Technology, so it is difficult to bring samples for assessment such as preservation, transportation, high assessment costs. The qualifications and capacity of some investigators, prosecutors and judges are still limited, leading to slow handling of the cases and also different perceptions and disagreements on the definition of crimes and penalty range. From the above difficulties and inadequacies, here are some recommendations:

First, Governments at all levels need to step up the propaganda and dissemination of education on the legal provisions on protec-

tion of wildlife, endangered, precious and rare animals to all classes of people, especially cadres, civil servants and party members.

Second, the Central Judicial Inter-branch should pay attention to invest funds for law enforcement agencies to raise their sense of responsibility in grasping the situation in order to promptly detect and strictly handle violations of the legal provisions on protection of wildlife, endangered, precious and rare animals.



▲ Lâm Đồng authorities check and arrest dozens of wild animals



Third, the National Assembly and Standing Committee of the National Assembly shall consider and study to soon issue a document stipulating that each province and centrally run city needs an assessor to assess the case, in order to quickly handle cases of violations of legal provisions on protection of wildlife and endangered, precious and rare animals. At the same time, issue specific and detailed guiding documents to understand and apply consistently to the case of handling physical evidences such as ivory, rhino horn... confiscated, which cannot be destroyed but handed over to specialized management agencies for scientific research.

Fourth, investigators, prosecutors and judges need to improve their professional capacity and qualifications, regularly cultivate experience, research and update information and legal documents related to the handling of violations of wildlife, endangered, precious and rare animals, in order to apply in practice in accordance with the legal provisions to avoid omission of criminals and unjust people who do not commit crimes.

Fifth, officers assigned the task of fighting and preventing wildlife crimes must have skills in identifying endangered, precious and rare wildlife species in order to quickly identify captured wildlife species, to quickly solve cases. At the same time, it is necessary to learn skills to identify endangered, precious and rare wildlife species through online websites or smartphone applications, for example, the “giamdinhloai” tool developed by WCS with online and offline versions.

Sixth, Chairmen of the people's committees of the bordering provinces need to strengthen the signing of agreements with the provinces sharing the border with the Kingdom of Cambodia on the content of cooperation regulations, exchange of situations, and coordination to maintain social security, order and safety, exchange of information in the fight against wildlife crimes, mobilization of border people of the two countries to strictly comply with and implement the Decree on border management regulations. Representatives of the provinces of the two countries sharing a border maintain regular meetings, exchange information, detect and promptly handle violations of wildlife, endangered, precious and rare animals ■

Calls for Hà Nội to prohibit breeding bears for bile at individual facilities

In 2005, Việt Nam made the extraction and sale of bear bile illegal. As the bears on farms were domesticated and unsuitable to be released back into the wild, farmers were allowed to keep their farms open, as long as the bears were microchipped for monitoring and had been registered before 2005. While the illegal trade of bear bile still continues, reduced demand has driven down prices and many bears have died from neglect or ill health.

Hà Nội is the largest bear breeding hotspot in Việt Nam with 149 bears being kept in private facilities, accounting for 51 percent of the total number of bears bred in cages in the country, according to Education for Nature-Vietnam (ENV). Phúc Thọ District in the Capital currently has 139 bears in personal facilities, accounting for 93 percent of the total number of bears in Hà Nội.

A group of organizations proposed some solutions to Hà Nội authorities for the protection of bears from exploitation in the Capital. ENV Deputy Director Bùi Thị Hà said: “It is time for the Capital to take drastic measures to soon close bear breeding facilities in the area in order to end the cruel and illegal breeding of bears for bile”.

The solutions suggested including strengthening the inspection and management of bear breeding facilities; firmly dealing with violations; confiscating bears in illegal captivity at facilities and strictly handling according to law provisions for serious violations.

Global Head of Wildlife Campaign, World Animal Protection Gilbert Sape said that since 2005, World Animal Protection has worked closely with the Vietnamese Government and authorities, as well as a group of organizations to protect bears in Việt Nam, with the goal of ending the bear breeding industry. “Ending bear breeding in Hà Nội is an important step towards ending the bear industry in the country”.

The group also called for the prohibition of breeding bears in private facilities, encouraging owners to voluntarily hand over bears to the Government and strictly ensuring the policy of “no compensation” to owners in all cases, as well as encouraging the use of herbs instead of bear bile. Many bears rescue centers, including FOUR PAWS Bear Conservancy in Ninh Bình Province, an international standard facility, have been built to give new life to bears that were once kept in cages, in a semi-wild environment ■

MAI HƯƠNG



Global pollution kills 9 million people a year

According to a new study in the Journal *The Lancet Planetary Health*, environmental pollution - from filthy air to contaminated water - is killing roughly 9 million people per year or about one of every six deaths worldwide. More than all war and violence in the world. More than smoking, hunger or natural disasters. More than AIDS, tuberculosis and malaria combined. For their most recent study, published in the online Journal *Lancet Planetary Health*, the authors analyzed 2019 data from the Global Burden of Disease, an ongoing study by the University of Washington that assesses overall pollution exposure and calculates mortality risk.

Experts say the nine million premature deaths the study found was just a partial estimate and the number of people killed by pollution is undoubtedly higher and will be quantified once more research is done and new methods of assessing harmful impacts are developed. The financial cost from pollution-related death, sickness and welfare is equally massive, the report says, costing some US\$ 4.6 trillion in annual losses - or about 6.2 percent of the global economy.

India and China lead the world in pollution deaths with nearly 2.4 million and almost 2.2 million deaths a year, but the two nations also have the world's largest populations. When deaths are put on a per population rate, the United States ranks 31st from the bottom at 43.6 pollution deaths per 100,000. Chad and the Central African Republic rank the highest with rates about 300 pollution deaths per 100,000,

more than half of them due to tainted water, while Brunei, Qatar and Iceland have the lowest pollution death rates ranging from 15 to 23. The global average is 117 pollution deaths per 100,000 people.

The study marks the first attempt to pull together data on disease and death caused by all forms of pollution combined. The analysis looks more specifically at the causes of pollution - separating traditional contaminants such as indoor smoke or sewage from more modern pollutants, like industrial air pollution and toxic chemicals.

Deaths from traditional pollutants are declining globally. But they remain a major problem in Africa and some other developing countries. Tainted water and soil and dirty indoor air put Chad, the Central African Republic and Niger as the three countries with the most pollution-related deaths, according to data adjusted for population. Deaths caused by exposure to modern pollutants such as heavy metals, agrochemicals and fossil fuel emissions are "just skyrocketing", rising 66% since 2000.

Three-quarters of the overall pollution deaths came from air pollution and the overwhelming part of that is "a combination of pollution from stationary sources like coal-fired power plants and steel mills on one hand and mobile sources like cars, trucks and buses. That air pollution remains the leading cause of death in South Asia reconfirms what is already known, but the increase in these deaths means that toxic emissions from vehicles and energy generation is increasing. In New Delhi, India, air pollution peaks in the winter months and last year the city saw just two days when the air wasn't considered polluted. It was the first time in four years that the City experienced a clean air day during the winter months.

Pollution deaths are soaring in the poorest areas. The vast majority of pollution-related deaths - 92 percent - occur in low or middle-income countries, where policy makers are chiefly concerned with developing their economies, Triana, lead environmental specialist at the World

Bank. The World Bank in April declared that reducing pollution, in all forms, would now be a global priority.

The study authors came up with eight recommendations to reduce pollution deaths, highlighting the need for better monitoring, better reporting and stronger Government systems regulating industry and cars ■

CHÂU LONG



▲ Three - quarters of the overall pollution deaths came from air pollution

Assessment of impacts of environmental pollution on Vietnam's biodiversity

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Vietnam's biodiversity

Việt Nam is recognized as one of the countries having high biodiversity in the world with a diversity of natural ecosystems, biological species, rich genetic resources and many endemic species. Up to now, in the living creatures of Việt Nam, about 51,400 biological species have been identified, including: 7,500 microbial species/strains; 20,000 species of terrestrial and aquatic plants; 10,900 species of terrestrial animals; 2,000 species of invertebrates and freshwater fish; There are over 11,000 marine biological species. Among the known biological species, the number of species endemic to Việt Nam accounts for a fairly large proportion (about 30% of terrestrial vascular plant species; 4.6 species and subspecies of birds; 27.4% of freshwater mussels and snails; about 58% of freshwater shrimp and crab species...) [1].

Table: Number of indigenous and endemic species of Việt Nam

	Endemic species	Indigenous species
Amphibians	52	153
Bird	7	665
Mammal	19	263
Reptile	74	30
Mollusca	0	3
Freshwater fish	214	37
Sea fish	10	131
Plants	27	261
Total	403	1,543

Source: Living National Treasures

Over the past two decades (2000 - 2020), more than 1,200 new species have been discovered in Việt Nam, some of which have surprised scientists globally. Particularly in the period from 2014 to December 2020, 644 new species for science were described and published in reputable scientific journals. A very special thing that is of interest to the whole world is that in a short period of time from 1992 to 2000, Vietnamese sci-

entists, in collaboration with the World Wildlife Fund (WWF) discovered 3 more large mammal species, 4 new small mammal species for science, namely: Saola (*Pseudoryx Nghetinhensis*) discovered in 1992; Giant muntjac (*Megamuntiacus vuquangensis*) discovered in 1993; Cow with twisted horns (*Pseudonovibos spiralis*) in the Central Highlands discovered in 1994; Trường Sơn muntjac (*Caninmuntiacas Truongsonensis*) discovered 1996; Central Highlands civet (*Viverra tainguyenensis*) discovered in 1998; Pù Hoạt muntjac (*Muntiacus puhoatensis*) discovered in 1997; Striped rabbit (*Isolagus timminsis*) discovered in 2000.

It can be affirmed that natural as well as artificial ecosystems have an important function in maintaining balance and stabilizing the natural and social environment in service of the peace and happiness of people, of nations, of the country because of their great values, that nothing can replace. The role of forest ecosystems on land, mangroves, sea areas and biodiversity in the field of environmental protection, especially ecosystems in river and coastal

watershed areas, has the effect of controlling and preventing erosion and regulating climate, minimizing disaster, supporting land reclamation, storing carbon, is a green lung, a giant screen for environmental security, national defense, social security, health of human and animals, but also a geochemical barrier that contributes to storing and shielding wastes from the mainland, from estuaries to the sea.

Impacts of environmental pollution on biodiversity in Việt Nam

Currently, in the market mechanism, production activities related to industry, agriculture, forestry, fisheries, tourism and social activities are interwoven in different forms with the effect of promoting economic growth significantly, creating a premise in improving the quality of life for society and the community. However, a number of activities in industry, construction, transportation, agriculture, forestry, fishery, craft villages, tourism... have



caused pollution in the air, water and soil environment that seriously affects terrestrial forest ecosystems, wetlands and marine areas, and biodiversity.

The number of threatened wild animal and plant species in nature has increased from 906 species (2007) to 1,211 species (2020), including 600 plant species and 611 animal species. In which, there are about 100 plant species and nearly 100 animal species with very precious natural genetic resources that are in danger of extinction [2]. Specifically, the Indochinese tiger (*Panthera tigris Corbetti*) before the 1980s (twentieth Century) was estimated to have between 800 - 1,000 individuals, widely distributed in mountainous areas from South to North, up to now it is estimated that there are less than 20 individuals left in the wild. The Asian elephant (*Elephas maximus*) before 1980 was estimated to have about 1,000 individuals in the wild, distributed from the Northwest to the Trường Sơn Mountain Range to the Southeast - especially the forests of the Central Highlands provinces (dipterocarp forest), often see herds of 20 - 30 individuals of all generations, but today the distribution area is only found in a few places with a very low number of no less than 100 individuals, mainly in the North Central region, Quảng Nam - Kon Tum - Đắk Lắk and Đồng Nai - Bình Phước.

Besides, Việt Nam also preserves a few natural genetic resources that are extremely precious not only to Việt Nam, but also of

global significance, such as the Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) which is endemic to Việt Nam, only distributed in a few Northeastern provinces of Việt Nam (Tuyên Quang, Bắc Kạn, Hà Giang) with the number of less than 200 individuals, concentrated mainly in Khu Ca Nature Reserve, Vị Xuyên District, Hà Giang Province. The Saola (*Pseudoryx vuquangensis*) was recently discovered in the Vũ Quang Forest in Hà Tĩnh (near the Việt Nam - Laos border) in 1992. This is a narrow endemic species found only in Việt Nam and the Lao People's Democratic Republic with a population of about < 50 individuals scattered in Hà Tĩnh, Quảng Trị and Thừa Thiên - Huế (WWF 2021). The peacock (*Pavo muniticus*) is a beautiful bird in nature, formerly widely distributed from South to North, but now only found in a few localities in the Central Highlands and Southeast with very low number. This is a valuable genetic resource of many aspects in the cultural life of Vietnamese people.

Especially, the ecosystems of wetlands, marine mangroves, coral reefs and seagrass beds are severely declined due to environmental pollution from garbage, plastic waste, and waste from industrial, agricultural production, oil spills from oil and gas exploitation, transportation activities... that have seriously affected lake ecosystems, riverine and coastal ecosystems. Typical environmental incidents in 4 Central provinces caused by Formosa Company in Hà Tĩnh have killed hundreds of aquatic species in Hà Tĩnh, Quảng Bình, Quảng Trị and Thừa Thiên - Huế; Untreated waste discharge incident caused by Hòa Bình Sugar Company, Tân Hiệp Hưng Co., Ltd. caused mass fish deaths on Bưởi River, Thanh Hóa (2016). Recently, in West Lake, Hà Nội, tens of thousands of tons of fish and all kinds of algae in the lake were destroyed due to the highly polluted lake water environment (2019). Be-



▲ Việt Nam has been facing increasing challenges in terms of biodiversity loss



side West Lake (Tây Hồ), there is Tô Lịch River flowing through 6 inner districts of Hà Nội Capital City (Ba Đình, Cầu Giấy, Thanh Xuân, Đống Đa, Hoàng Mai, Thanh Trì) which has been seriously affected by pollution. These are densely populated and crowded areas, along with traffic, industrial and agricultural production... which have discharged untreated wastes into the river, turning the Tô Lịch River from a green river into a dead river due to polluted environment.

Việt Nam has a coastline of 3,260 km with a water surface area of about 1 million km² with many unique ecosystems and high biodiversity. In recent years, due to overexploitation and the use of destructive fishing methods along with environmental pollution, ecosystems, coral reefs and seagrass beds have been depleted, causing disturbances in inherent natural ecosystems, affecting biodiversity such as migratory birds in the sea, sea turtles, marine fish and animals. For example, populations of Chinese white dolphins (*Sousa chinensis*) before 1990 were common in the islands and archipelagos of Quảng Ninh - Hải Phòng, or dugon dugon often appeared on Phú Quốc island..., but no longer appears; The decline in mangrove ecosystems from the South to the North leads to a decrease in biodiversity, affecting the economy and health of the community, especially those living along the coast.

The above are a few specific examples reflecting the current situation of environmental pollution in some areas of Việt Nam that has affected biodiversity. Obviously, when the environment is polluted, an environment with a lot of carbon dioxide in the air will make photosynthesis increase, leading to the growth of trees but unevenly, weeds grow stronger than plants. Some species of plants, animals, bacteria and viruses that have the ability to adapt will thrive, while some species that are not able to adapt will grow slowly or even be destroyed.

In the UNEP Global Assessment Report, it has warned that environmental pollution currently causes a sharp decline in natural ecosystems by an average of 47% and about 25% of threatened species. It is forecasted that if the situation of environmental pollution is not improved along with climate change, up to 1 million plant and animal species will be destroyed. The decline and loss of biodiversity in nature, as well as in man-made, means the loss of traditional indigenous knowledge of local communities because the diversity of ecosystems that have created conditions for

humans in different regions, traditional knowledge in the exploitation, use and conservation of ecosystems, species conservation and conservation of genetic resources of biodiversity is formed. In Việt Nam, there are hundreds and thousands of good and effective models in using and protecting biodiversity through traditional indigenous knowledge in regions that need to be investigated, inventoried and evaluated in order to integrate, apply into environmental protection management as well as biodiversity conservation, restoring impoverished ecosystems.

Solutions proposed to prevent environmental pollution for biodiversity

First, environmental pollution is mainly caused by humans from economic, social and tourist development activities... So, people need to be aware of their responsibilities to behave in a friendly manner and respect nature, live in harmony with nature. Therefore, the solution to raise the awareness and responsibilities of people in society in each country is a necessary and regular requirement.

Second, strongly condemn acts that cause environmental pollution on land, wetlands, sea areas, urban or rural areas.

Third, strictly implement the guidelines of the Prime Minister and the Government of the Socialist Republic of Việt Nam "No trade-off between economic growth and environmental protection". Must be checked and supervised everywhere, severely punished if violating.

Fourth, be serious, responsible to implement the provisions of the Law on Environmental Protection 2020 and the Law on Forestry 2017 on forest protection, biodiversity conservation, protection of rare and precious genetic resources, classification, collection, transportation and recycling of production waste, domestic waste, and prevention of plastic waste from being dumped into lakes, ponds, rivers and seas.

Fifth, invest in science and technology in the field of environmental technology, promote the circular economy and green economy.

Sixth, in responding to the movement of planting 1 billion trees launched by the Government in all regions of the Country - plant, care and protect green trees.

Seventh, promote international cooperation in studying the impacts of climate change on biodiversity and health ■

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Ten of the world's most endangered animals in 2022

In celebration of National Endangered Species Day, which falls on May 20th, we recognize the animals around the world most in need of protection and conservation efforts. Here is a list of 10 critically endangered animals in 2022, according to World Wildlife Fund (WWF).

1. Amur Leopard

First on the list of the world's most endangered animals in 2022 is the amur leopard. Between 2014 and 2015, there were only around 92 individuals left in their natural range. This number is now estimated to be around 84. They are extremely vulnerable to poachers, who kill them for their coats and bones, the latter of which is sold for use in traditional Asian medicine. They are at risk of habitat loss due to natural and man-made fires. Climate change is also leading to a decrease in prey availability.

2. Rhino

Rhinos are one of the most poached animals on the planet. Their horns are used in traditional Chinese medicine and displayed as a symbol and demonstration of wealth. A Javan rhino horn can sell for up to US\$ 30,000 per kg on the black market. Because of poaching, three of the five species of rhinos are among the most endangered animals in 2022: the black rhino, the Javan rhino and the Sumatran rhino. The Javan rhino is the closest to extinction with only around 60 individuals left, all of which are in Ujung Kulon National Park in Indonesia, while black rhino population is estimated to be around 5,500 individuals.

3. Orangutan

The two kinds of orangutan - the Bornean and the Sumatran Orangutan - have both experienced sharp declines in populations. A century ago, there were probably more than 230,000 orangutans in total, but the Bornean orangutan is now estimated at about 104,700 based on updated geographic range and the Sumatran about 13,846. They are primarily threatened by habitat loss from human-caused deforestation for palm oil.

4. Gorilla

There are two species of gorillas, the Eastern gorilla and the Western gorilla, which both have two subspecies. Three out of four are Critically Endangered on the IUCN Red

List of Threatened Species. The only one that is not is the Mountain Gorilla, a subspecies of the Eastern Gorilla, which is considered Endangered. There are only around 200 - 300 adult Cross River gorillas left in the wild. Like many endangered animals, their decline is mostly due to poaching, habitat loss, disease and human conflict. Gorillas are also slow to recover as they have a low reproductive rate, with females only giving birth every four to six years. One female will breed three or four times in her lifetime.

5. Saola

Often called the Asian unicorn, the Saola is one of the rarest mammals on the planet. It was first discovered in 1992 in the Annamite Range in Việt Nam and is rarely seen. No formal surveys have been undertaken to determine accurate population numbers, but the IUCN estimates the total Saola population to be less than 750, likely to be much less.

6. Vaquita

As both the smallest and most endangered marine mammal in the world, the Vaquita has been classified as critically endangered by the IUCN since 1996 and experts say there may only be about 10 individuals left, despite extensive conservation efforts. Their biggest threat is from the illegal fishing of totoaba, a large fish in demand because of its swim bladder. Vaquitas accidentally end up entangled in the gillnets set for totoaba and drown because they can no longer swim to the surface to breathe.



▲ Gorilla females only giving birth every four to six year



Conservation efforts led to the introduction of a ban on gillnets in Vaquita habitat back in July 2016, but illegal fishing continues, and the threat remains. Efforts now focus on enforcing the Ban on gillnets and persecuting those that use them. Conservationists are also working to decrease demand for totoaba, which is a protected species.

7. Sunda tiger

Of all the big cats, tigers are the closest to extinction. With fewer than 3,900 tigers remaining in the wild, they exist in only 4% of their historic range. Sunda tigers in particular are especially vulnerable. With numbers estimated to be at fewer than 400 today, accelerating deforestation and rampant poaching mean it could end up extinct like its Javan and Balinese counterparts. Despite increased efforts in tiger conservation - including strengthening Law enforcement and anti-poaching capacity - a substantial market remains in Sumatra and other parts of Asia for tiger parts and products.

8. Yangtze Finless porpoise

Finless porpoises live in the Yangtze River in China. Unfortunately, they are vulnerable to fishing; even though they are not directly targeted by fishermen, large numbers of the species die when they become accidentally entangled in fishing gear. The waters they live in are also constantly busy with fishermen and people using the waterways to move around, so they get injured and killed by boats and ships. Additionally, their waters are also affected by high levels of toxic pollutants. There are between 1,000 and 1,800 finless porpoises left in the Yangtze. The annual decline rate of 13% means these animals are expected to become extinct within 10 years if there are no effective conservation actions in place.

9. Turtle

Two species of sea turtle are Critically Endangered on the IUCN Red List of Threatened Species: Hawksbill Turtles and Kemp's Ridley Turtles, while Leatherback sea turtles are classified as vulnerable, though the population is decreasing and several subpopulations are facing extinction. Hunting is one of the biggest threats to sea turtles, with poachers targeting their eggs, shells, meat and skin. They are also at risk from habitat loss, bycatch and pollution as well as climate change. Sand temperature determines the sex of hatchlings with eggs developing as females in warmer temperatures. That means even small temperature changes could skew the sex ratio of populations.

Recent estimates show us that there are nearly 6.5 million sea turtles left in the wild with very different numbers for each species. Population estimates for the hawksbill turtle range from 83,000 to possibly only 57,000 individuals left worldwide. Kemp's Ridley and Flatback turtles each have a very narrow distribution, with less than 10,000 individuals left for each species (medium estimates: 25,000 and 69,000 respectively).

10. Elephant

Last on the list of the world's most endangered animals in 2022 are elephants. While some populations of African elephants are increasing, primarily in Southern Africa, numbers are continuing to fall in other areas, particularly in Central Africa and parts of East Africa. With an estimated 415,000 elephants left on the continent, the species is regarded as vulnerable, although certain populations are being poached towards extinction. Asian elephant numbers have dropped by at least 50% over the last three generations and they're still in decline today. With only 40,000 - 50,000 left in the wild, the species is classified as endangered. However, the species most at risk is the Sumatran elephant, with a population of about 2,400 - 2,800 individuals.

As we reflect on this list on National Endangered Species Day, let us be reminded of the work that still needs to be done to ensure that these species and all others continue to inhabit the planet for generations to come ■

NAM VIỆT



▲ *Hunting is one of the biggest threats to sea turtles*



Nha Trang scrambles to save coral reefs from bleaching

Saving the coral reefs in Nha Trang Bay Marine Protected Area (Khánh Hòa Province) from massive bleaching is a priority that requires a long-term, scientific and sustainable strategy, scientists and oceanographers have said. Coral bleaching occurs when corals are stressed by changes in conditions such as temperature, light, or nutrients and they expel symbiotic algae living in their tissues, causing them to turn white.

The degradation of the coral reef ecosystem in the core zone of Nha Trang Bay

Recently, the public has been stunned by the image of coral around Hòn Mun Island, the core area of Nha Trang Bay Marine Protected Area (MPA), which has been severely damaged. The beautiful coral reefs are a tourist attraction in Nha Trang Bay for their diverse marine ecosystem and dense coral reef ecosystem and as a breeding place for many species of fish.

Nha Trang Bay MPA (formerly Hòn Mun MPA) was established in 2001, covering an area of about 160 square kilometers, including thirty-eight square kilometers of land and 122 square kilometers of water around nine islands of Hòn Tre, Hòn Miếu, Hòn Tằm, Hòn Một, Hòn Mun, Hòn Cau, Hòn Vung, Hòn Rơm and Hòn Ngọc. It has diverse ecosystems in which hard corals are found on Hòn Mun Island.



▲ Coral reefs in Nha Trang Bay MPA are dying

According to scientific researchers, the coral reef ecosystem is particularly susceptible to environmental factors such as changes in temperature, light intensity and acidity in the water. The amount of sediment and some elements of salts and metals also affect the viability of the coral reefs. Dr. Nguyễn Tác An, Former Director of Nha Trang Oceanography Institute said the MPA's environment all over the country, including Nha Trang Bay, had been seriously degraded.

In addition to the impact of climate change, the Hòn Mun coral reef has been under pressure from economic development. Dr. Nguyễn Tác An said it is necessary to have objective and scientific research and assessment on the cause of damage to the coral reefs. Residents and visitors have also been angered.

A resident of Nha Trang City Đỗ Thành Quân said he returned to the diving site in Hòn Mun Island after two years of the pandemic and was sad to see white dead coral along the beach. When diving deep into the sea floor, many areas of coral reefs were no longer as vibrant as in previous years. A diving coach with more than 20 years in the profession, who asked for anonymity, said the coral reefs were dying. The seabed of Hòn Mun had turned from a beautiful scene into ravaged, bleached coral reefs. He said low awareness of marine conservation, illegal fishing and overexploitation, and loose management of functional forces were the key issues.

Alarming numbers

The assessment and monitoring of biodiversity resources have been carried out since 2002. The results of surveys and scientific research conducted by Nha Trang

Oceanography Institute from 2002 to 2015 in Nha Trang Bay's strictly protected areas showed that coral reefs remained stable. Meanwhile, most monitoring points outside the protected area saw a decrease in the coverage of corals by 7.2 percent since 1994.

Nha Trang Bay Management Board (MB) conducted a biodiversity survey in Hòn Mun protected subdivision. The survey showed that the quality of the Hòn Mun coral reef was average. The average coral coverage was recorded in the Northeast Hòn Mun area with about 41.63



percent, followed by low coverage of 24.6 percent and 14.5 percent in the Northwest and Southeast areas, respectively. A very low coverage was reported in the Southwest area with only 7.8 percent.

In 2015, the coral reefs in the Northeast and Southwest areas were in a good state with an average coverage of 53.7 percent, but in 2022 that reduced to only 32.62 percent. The Southeast and Northwest areas, with an average coverage of 52.2 percent, fell into poor coverage with only 11.15 percent.

Head of Nha Trang Bay MB Huỳnh Bình Thái admitted the deterioration of the coral reef ecosystem but said many factors caused the situation. Extreme weather has left some areas with rich and diverse coral reefs, such as Hòn Mun, Hòn Một, Hòn Tằm and Northeast Hòn Tre, severely damaged. Up to 70 - 80 percent of corals were destroyed after Typhoon Damrey in November 2017. In Hòn Tằm alone, the coverage of hard corals declined from 56.8 percent in July 2017 to 12.5 percent in December 2017.

In 2019, corals started bleaching because sea water temperatures increased in some areas on Nha Trang Bay. The hard coral's bleached rate is 39.5 percent this year. At the end of 2021, coral reefs in the area continued to be affected by typhoons. Up to 70 percent of the coral reef in Southwestern Hòn Mun and the South was washed ashore. In addition, tourism development, water pollution from aquaculture, polluted water from the Cái River flowing into Nha Trang Bay and illegal fishing worsened the situation.

In March 2022, the MB's patrol force fined a vessel VNĐ 12.5 million (US\$ 538) for illegally exploiting aquatic products in the form of electric guns in the North of Hòn Rơm in the strictly protected subdivision. The patrol force has repeatedly dealt with fishers who deliberately drive large-capacity vessels

to the restricted area for illegal fishing. The force had only one patrol vessel with six crew members in charge of more than 296 square kilometres across the Bay.

Sustainable economic development strategy

Mr. Huỳnh Bình Thái said the MB planned to install surveillance cameras in the entire Bay in the near future to give fines to all violating vessels. More importantly, the authorized agencies need a development strategy to improve the quality of people's lives around the Bay. The MB has continuously called on organizations and individuals in the area to regularly release aquatic resources to the Hòn Mun strictly protected area. He said that it has worked with diving clubs to avoid damaging coral and raise public awareness of coral protection.

According to experts, the National Assembly and the Government need appropriate policies to preserve the sea and develop the economy. Dr. Nguyễn Tác An, Former Director of Nha Trang Oceanography Institute emphasized that conservation was not simply about releasing animals but required changes in conservation policies to promote marine resources in a scientific way so that marine resources would be protected and developed to their full potential. He said coral restoration in Nha Trang was not easy as culturing a coral reef could take thousands or even millions of years.

He said stable livelihoods for local people would prevent them from going into the protected area for illegal fishing. "It is necessary to immediately stop the exploitation of marine resources in Nha Trang Bay and tightly control sea projects to clean up the Bay and then a long-term and sustainable project will help solve the situation", he said. Chairman of Khánh Hòa Province's People's Committee Nguyễn Tấn Tuấn said that the Committee had assigned Nha Trang City to handle the problem. "The immediate task is to check the environment and work with the Institute of Oceanography to find out the cause of the massive death of coral", he said ■

HỒNG NHUNG



▲ Tourists enjoy coral reef sightseeing tours at Hòn Tằm in Khánh Hòa Province



European Investment Bank commits up to US\$ 20 million to fight plastic pollution in Asia

Singapore-based investment management firm, Circulate Capital, has announced that the European Investment Bank (EIB) has committed up to US\$ 20 million to the Circulate Capital Ocean Fund I-B (CCOF I-B). The Fund's inaugural investments are innovators that implement solutions in the biotechnologies, sustainable fashion and smart materials sectors as well as digitization of the recycling value chain to combat plastic waste and climate change. These enterprises include Arzeda, Circ, Phase Change Solutions and Recykal - they represent some of today's most cutting-edge innovations that are disrupting a cross-section of supply chains and have proven technologies and ambitions to expand in Asia where there is strong potential for financial, environmental and social returns. EIB's Vice-President Ricardo Mourinho Félix said: "Preserving the health of our oceans is key to tackling climate challenges and preserving our economic prosperity. Through the EIB's Climate Bank Roadmap and Clean and Sustainable Ocean Program, we are committed to investing in climate action and environmental sustainability around the world. In particular, we want to support projects aimed at reducing pollution, by recycling and re-using plastics, so that we can ensure a better future for all. I am therefore very pleased to back initiatives that make this financially viable, such as the CCOF I-B".

In December 2021, Circulate Capital announced the US\$ 25 million second close of CCOF I-B.

"In order to advance the circular economy and mitigate the negative effects of plastic pollution on climate change, we need to scale investment dollars into this sector immediately", said CEO and Founder of Circulate Capital Rob Kaplan. "The EIB's commitment to CCOF I-B is a key indicator that the sector is ready for institutional capital. We are grateful that our investors, including global corporations, family offices, foundations and now institutions like the EIB are working together to bring investible solutions that foster and advance climate resilience to market standards".

As the EU's Climate Bank, the EIB committed to support €1 trillion of climate action and environmental sustainability investments in the next decade. Under its Clean and Sustainable Ocean Program, of which the Clean Oceans Initiative is one important pillar, the EIB supports investments that will contribute to improve the health of the oceans and their resources.

CCOF I-B invests both into disruptive innovations aligned with Circulate Capital Disrupt (CCD), the firm's climate-tech strategy and into the South and Southeast Asia recycling value chain, alongside the Firm's US\$ 112 million Circulate Capital Ocean Fund (CCOF I). CCOF I-B is targeting a total raise of US\$ 80 million and is therefore in consideration with other investors, as recently disclosed by the International Finance Corporation (IFC). ■

ĐỖ HOÀNG



▲ Plastic waste in South-East Asia

US\$ 43 million boost for developing countries' efforts to reverse species loss

With global biodiversity loss at dangerous levels, 139 countries have received a lifeline to fast-track efforts to conserve, protect and restore species and ecosystems as soon as a new global accord currently under negotiation is approved. The new financing from the Global Environment Facility (GEF), totaling US\$ 43 million, will give developing countries the means to quickly put the anticipated Post-2020 Global Biodiversity Framework (GBF) into practice and make headway towards the goal of halting and reversing species loss this decade.

Supported with technical expertise from the UN Development Program (UNDP) and UN Environment Program (UNEP), the participating countries will be eligible for new grants of US\$ 300,000 for work to analyze and align their national policies, targets, finance and monitoring systems to take effective action on global threats to biodiversity. "As we celebrate the International Day for Biological Diversity, this commitment shows that the world is united in recognizing the urgent need to end the destruction of nature and the loss of the services it provides. This early action will prepare Parties to mobilize for the action that all sectors of society will take to make these aspirations a reality in the 10 years ahead", said Executive Secretary of the Convention on Biological Diversity (CBD) Elizabeth Mrema. The Post-2020 GBF, a ten-year plan to halt the increase in the rate of extinctions and bring 30 percent of land and sea areas under protection, is expected to be agreed by the 196 parties to the CBD when they meet in Kunming later this year.

CEO and Chairperson of the GEF Carlos Manuel Rodriguez said it was critically important for all countries to be ready to act quickly once the new framework is approved. "Setting our aspirations is only a first step and this coming decade requires us to sprint. Recognizing the intense pressures on developing countries as well as their unprecedented com-



- GEF to provide US\$ 43 million in financing for developing countries to fast-track halting of species loss.
- 139 countries get funds to take quick action on nature ahead of global agreement on biodiversity.
- The Post-2020 GBF expected to be adopted later in 2022 will aim to halt and reverse biodiversity loss within a decade.

mitment to change the trajectory of biodiversity loss, the GEF is making these early action grants available even before the new global accord is agreed. Countries can use this "fast track" financial approach to update their biodiversity strategies and build capacities to deliver in the GBF. We stand ready to continue to help stewards of globally important biodiversity elevate nature in their planning and quickly scale up efforts that together can turn international goals into reality", said Mr. Carlos Manuel Rodriguez.

"The GBF represents a critical opportunity to set our planet on a new course", UNEP Executive Director Inger Andersen said. "But the global pandemic has left us with no time to waste. This joint initiative to accelerate preparedness by national actors shows that together, we are ready to put nature at the heart of decision-making about our shared future". "We need to create a planetary safety net by putting nature at the heart of our global, national and local economies and development frameworks. Nature underpins half the world's jobs and livelihoods, is the foundation for national food and water security and is essential for tackling our climate crisis. Investing in early actions on nature is a triple win for people and the planet", stated UNDP Administrator Achim Steiner ■

VŨ HỒNG



More effort needed on plastic ocean waste

Waste classification at home is essential to reducing plastic waste. The statement was made by Deputy Director of the Department of Science, Technology and International Cooperation, the Vietnam Administration of Seas (Ministry of Natural Resources and Environment - MONRE) Nguyễn Mỹ Hằng at a conference held in Hà Nội on June 8th, 2022. The Embassy of the United States in Việt Nam organized the meeting to discuss efforts and measures to reduce ocean plastic waste, marking World Ocean Day (June 8).

Answering audience inquiries, Ms. Nguyễn Mỹ Hằng said classifying waste at the sources was one of the much-needed behaviors to reduce plastic waste, which will help manage plastic waste in the ocean. The Law on Environmental Protection (LEP) 2020 has a specific provision for waste classification. If someone does not classify waste, they will have to pay taxes and fines. The MONRE is writing more detailed instructions under this Law to actualize and monitor waste classification", she said.

However, classification methods need to be thought out carefully and people should be given detailed instructions on how to do it, she added. "There are many criteria to classify waste that can be applied to families, factories, production houses and enterprises that import waste. Waste classification responsibility should be delegated to the groups in the plastic management chain", she said.

"For example, I have my trash in our family and my children have theirs. But we live on different floors, so how can we classify them? Does it mean I need to have three bins on my floor and my children have three on theirs? That is an example to illustrate that waste classification in each family is undoubtedly needed and a must-do. But with it comes several other requirements. So, the MONRE will give out detailed instructions in the future".

Projects that were implemented in Việt Nam to manage plastic ocean waste were presented at the conference by representatives from the National Plastic Action Partnership (NPAP) and the United States Agency for International Development (USAID). One of the key challenges to reducing ocean plastic waste pollution identified by the speakers was the unsmooth process of managing solid waste.

Mr. Nguyễn Đức Dương, an advisor for Energy, Environment and Climate Change at USAID said: "Plastic waste is part of the solid waste management process, and we should not separate them. The major problems we have encountered are in the stages of collecting, transferring, and treating solid waste. And these challenges

lead to a rise in plastic waste pollution, which is one of the consequences of bigger problems in the system".

International research shows that more than 80 per cent of waste found in the world's oceans is plastic. A research project done by the International Union for Conservation of Nature and Vietnamese authorities shows that plastic waste made up more than 90 percent of the trash collected in conversation areas in Việt Nam ■

NAM HUNG



▲ Members of Nam Định Province's Youth Union and officials from the Xuân Thủy National Park picked up trash on the beach in Giao Hải Commune, Giao Thủy District (Nam Định Province)



In the age of extinction, 212 new freshwater species discovered

The New Species 2021 Report from Shoal - (a freshwater conservation organization) - shows a diverse range of freshwater species new to science found around the world. Ninety-four of the newly discovered creatures were found in South America, 82 were found across Asia and 29 were found in Africa. The seven remaining new species were found in North America, Mesoamerica, Europe and Oceania.

Each year, scientists discover hundreds of freshwater species and experts are excited about those found in 2021. According to Shoal, each new discovery proves there is still much about the world of wonder underneath the surface of the planet's rivers, lakes and wetlands that remains unknown and gives hope to what more could be out there and draws more attention to often disregarded freshwater organisms.

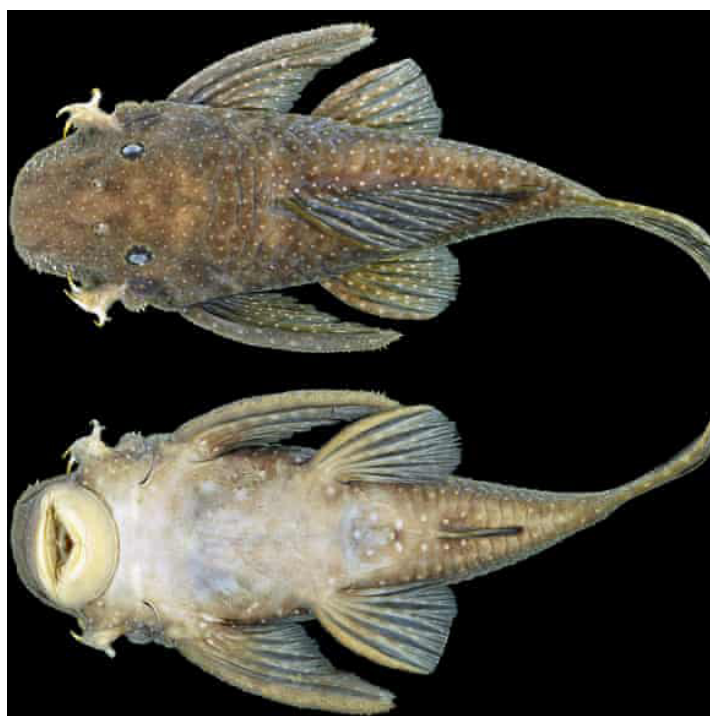
"It's fascinating that over 200 new freshwater fish species can be described in just a single year. You might see this level of new discovery for organisms like plants or insects, but not really for vertebrates. It means there are still hundreds and hundreds more freshwater fish out there in the world that scientists don't know about yet. Also, many of the newly described species have pretty unique and unexpected traits", said Shoal's Conservation Program Manager Harmony Patricio.

Each of the 212 discoveries offers new possibilities for scientists to increase their understanding of freshwater species, including their anatomy, evolution and the connections between other creatures and their habitats. The male *Daniella cerebrum*, for example, has got researchers curious about its ability to make a drumming sound, most likely by tapping a thin strip of cartilage on its swim bladder, like a drumstick - a relatively complex and unusual form of communication for such a tiny creature. The same species has no roof to its skull - its brain cavity is covered only by a thin layer of skin - making it possible for scientists to study brain activity twinned with function without harming the fish.

One of the most interesting species in the Report is the Wolverine pleco, or *Hopliancistrus wolverine*, discovered in the Rio Xingu Basin of Brazil. This creature, like Wolverine, whips out three curved spines when under attack; the spines are hidden beneath the animal's gill covers. When it isn't stressed by potential predators, this fish is calm and dines on algae and detritus. But when it feels threatened, those secret spines can do serious damage.

"When I first collected tricone's in the Tapajós River Basin, we all had our fingers injured or bleeding by the violence of them trying to pinch us with their big lateral hooks on the head" said Ms. Lucia H. Rapp Py-Daniel, one of the researchers on the 2021 Description Paper. At the field in the Tapajós, the fishermen started calling them "Buffalo Bill".

In Mumbai, researchers also discovered the Mumbai Blind Eel (*Rakthamichthys mumba*) in the bottom of a 40-foot-deep well on the property of a school for children with blindness. The unique eel has no eyes, scales or fins. Researchers discovered an average of four freshwater fish per week in 2021. Two other highlights include the gorgeous *Parosphromenus juelinae* and *Parosphromenus kishii*, two species of fish that resemble gemstones with their colorful, shimmering scales found in Indonesia. The researchers are calling for both fish to be listed as Critically Endangered, according to the Shoal Report.



▲ The *Hopliancistrus wolverine*, whose hidden spikes inspired researchers to name it after the X-Men character



▲ A male *Danionella cerebrum*

There are at least 18,267 species of freshwater fish, according to the standard reference book, Eschmeyer's Catalog of Fishes. But the overall freshwater picture is concerning. According to the World's Forgotten Fishes Report, which Shoal, WWF and other partners published in 2021, more than a third of freshwater fish species are threatened with extinction, despite their importance to biodiversity and as a food source to billions of people.

"We know that 80 species of freshwater fish have gone extinct in modern times, while there are usually around 150 - 200 or more new species discovered in an average year. But population levels of many freshwater fish have declined massively over the past 50-plus years", said Mr. Harmony Patricio.

The discoveries help provide insight into history as researchers connect the newly discovered species to their ancestors while also offering more information on how to conserve these freshwater species. "In this age of extinction, it is freshwater ecosystems that are the sharp end of the wedge. With myriad threats including dams, pollution, unsustainable fishing and invasive species, around 1 in 3 freshwater fish species are threatened with extinction, freshwater fish are disappearing at twice the rate of marine or terrestrial species", the Report concluded.

Shoal hopes its inaugural new species report will raise awareness "about the freshwater biodiversity crisis we're facing and hopefully "they'll be motivated to support conservation efforts and encourage their Governments to do more" ■

PHƯƠNG LINH

Europe plans to ban thousands of hazardous chemicals

Promises must be lived up to. In its Chemicals Strategy for Sustainability of October 2020, part of the European Green Deal, the European Commission (EC) pledged to protect the environment by progressing the use of safe chemicals and banning the most hazardous chemicals. That promise is now being met. The Restriction Roadmap states that thousands of the most hazardous substances will be banned by 2030. This includes frequently used additives for plastic and PVC.

Environmental organizations have pushed for this for a long time and are reacting positively. Worldwide this is the most ambitious approach to banning dangerous chemicals which includes hormone disrupting substances, fire retardants and all PFAS.

A different approach for each group of chemicals

To date, each chemical substance was individually assessed for admittance into the European Union (EU). This approach could not keep pace with developments. Not only did it involve long procedures, but industry develops different chemical substances all the time. Take bisphenol A (BPA) for example. It is a well-known hormone disrupting substance that is used in a lot of plastic products such as plastic bottles, electronics, toys and receipts. After the EU classified BPA as a toxic substance in 2016 and banned its use in baby bottles, manufacturers started using alternative substances that had similar qualities as BPA, but which just fell outside the legislation such as bisphenol S (BPS), bisphenol F (BPF) and bisphenol HPF (BHPF).

Still a long way to go

The call to regulate the related chemicals as one group in one go instead of individually grew strongly in the last few years. The EU has not opted to adopt a group approach to better handle the most problematic substances. The roadmap should be seen as a political objective and its approach is supported by the member states. In itself, the roadmap does not, however, guarantee that the contentious chemicals really will be banned. There will be long procedures to evaluate the restrictions which will give manufacturers all sorts of openings to resist them.

A ban will have a major impact on the chemical industry so strong resistance is to be expected. The chemical industry will undoubtedly go to court to try to prevent or delay a ban on certain substances, as Plastics Europe unsuccessfully tried to do through the European Court to prevent BPA from being classified as a substance of very high concern ■

NHẬT MINH



Effective air pollution prevention strategies

Sometime between 1820 and 1840, the world began transitioning to new manufacturing processes that became known as the Industrial Revolution. While this represented a turning point in the history of technological advancement and molding the world as we know it today, industrialization came at a huge cost for the environment and affected worldwide air quality, especially in new, developing urban areas. Even today, the highest levels of air pollution are recorded in cities. Six of the world's 10 most polluted cities in 2021 were in India, with Bhiwandi topping the list, while neighboring countries like Pakistan and Bangladesh are also some of the worst affected. In China, despite the huge progress made in recent years, where particulate pollution saw a 29% drop globally, 1.25 million people still die prematurely from pollution-related diseases every year.

The world has made remarkable advancements in air pollution reduction technologies and an increasing number of countries around the world have pledged to end all emissions in the coming decades. We explore the main drivers and effects of air pollution on the environment before diving deep into some of the best strategies for air pollution prevention.

Drivers of air pollution

Air pollution refers to the release of chemicals and pollutant particles into the air, mainly through human activities. Among the biggest contributors are fossil fuels. Global demand for oil, natural gas and coal continues to increase despite calls to end our dependence on these energy sources to meet net-zero emissions goals. In 2021, global energy-related emissions reached a staggering 36.3 billion tons of CO₂ their highest-ever level. 40% of which came from coal - soaring to an all-time high of 15.3 billion tons - followed by 10.7 billion tons from oil and 7.5 billion tons from natural gas.

Another driver is ozone, a toxic gas that turns into smog - an extremely harmful form of air pollution - when it reaches too close to the ground, significantly reducing visibility. Extreme climate events like dust storms as well as changing weather conditions are also responsible for poisoning the atmosphere. For example, high air pressure and heat waves can create stagnant air where pollutants usually concentrate in large quantities. Extreme heat waves also increase the risks of large-scale wildfires, notorious for releasing more carbon emissions, smog and pollutants into the air.

Effects of air pollution on the environment

Apart from causing millions of premature deaths and illnesses - especially in low-income countries like South and East Asia - there is growing evidence among the scientific community that air pollution can have detrimental impacts on other aspects of human health and wellbeing - such as their cognitive function. Several studies have found that polluted air often impedes or lowers the cognitive ability of those frequently exposed to it.

But air pollution does not only impact humans. Its environmental effects are also vast and worrying. They range from acid rain - which is extremely harmful to the soil and plants - to birth defects, reproductive failure and diseases among wildlife animals. Highly polluted rain can also compromise agriculture, as it makes crops more vulnerable to diseases from increased UV radiation caused by ozone depletion.



Every year, air pollution is responsible for an estimated seven million premature deaths worldwide. It is also one of the biggest threats to human health, increasing the risk of chronic heart and pulmonary diseases, lung cancer, stroke and respiratory infections. In addition, it is contributing to the climate crisis and accelerating global warming. Nearly all the global population is breathing highly polluted air every day. Governments urgently need to commit to air pollution prevention in an effort to solve one of the direst environmental problems in the world right now.



Air pollution prevention

While we know much about the causes and effects of air pollution, there is still much to be done in terms of prevention. To understand how Governments can tackle the problem, it is useful to have a look at the main sectors contributing to global greenhouse gas (GHG) emissions. Indeed, the only ways to drastically reduce air pollution are to adopt a wide range of policies that regulate all polluting industries - from energy production to transportation and agriculture - as well as to reflect on broader solutions such as carbon tax systems.

Cut down emissions from power plants

One obvious but effective strategy to cut down emissions is to phase out fossil fuels immediately, yet it has proven to be difficult to implement. As the latest IPCC climate report clearly stated, in the race to reach net-zero emissions, there is no room for any fossil fuel developments. Shifting to other energy sources like nuclear and renewables is a long and complicated process that requires global coordination and collaboration. Yet not all countries are on board and while some are slowly making the transition, others have no intentions of phasing out fossil fuels.

In the meantime, countries like the US are implementing strategies to hold power plants accountable for their pollution. For example, in March 2022, the Environmental Protection Agency (EPA) unveiled the "Good Neighbor" Plan to cut interstate smog pollution from power stations by requiring them to operate their pollution control equipment and keep their daily emissions under a pre-established limit.

Decarbonize the global transport sector

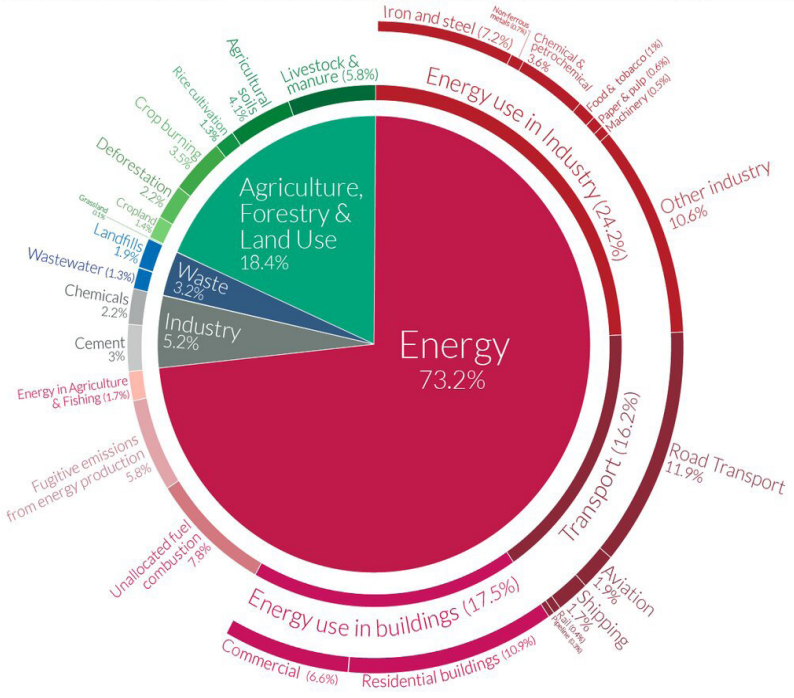
Transport accounts for 8 billion tons - or approximately one-fifth - of global carbon dioxide emissions. These are expected to grow significantly over the next 30 years as a result of increasing transport demand.

According to the EPA, there are three methods to reduce GHG emissions from transportation. The first is to increase the efficiency of vehicle technology. A good start - according to a report by the United Nations - is developing weight reduction and improvements to engines and tires that can make vehicles more fuel-efficient, reduce their reliance on oil and cut expenses.

Global greenhouse gas emissions by sector

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.

Our World in Data



OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020).
Licensed under CC-BY by the author Hannah Ritchie (2020).

▲ Figure 1: World's most polluting sectors, 2020

One of the most important technologies we have to decarbonize the transport sector is electric vehicles (EV). Significant progress has been made in this industry and costs of batteries have declined by 90% in recent years. Despite EVs being a much better alternative than fossil fuel vehicles, as the latter generate much higher emissions over their lifetime, the electrification of the transportation sector has a dark side. Producing EV batteries requires greater resource extractives, which has substantial destructive consequences for the environment and local communities, an aspect of this industry that cannot be ignored. Fortunately, EV companies are building a much more sustainable supply chain by improving the efficiency and lifespan of batteries, researching a way to build them using other resources as well as recycling old batteries to reuse raw materials.

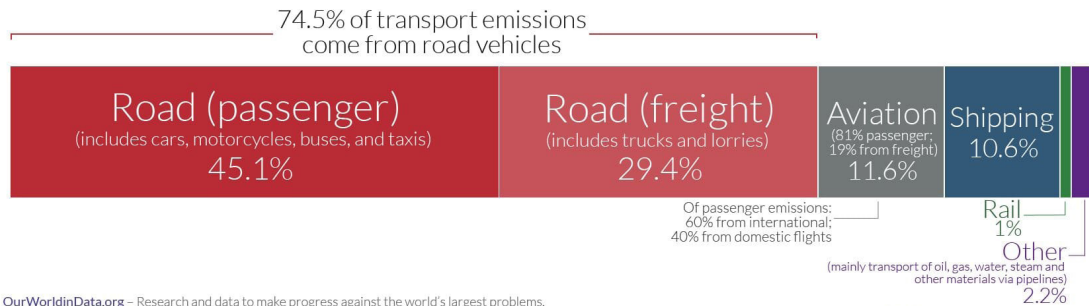
But switching to EVs is not the only option we have. We can lower transportation's carbon footprint by changing how we travel - for example, opting for public transport and car-sharing - as well as how we transport goods around the world. Emissions from the global supply chain have reached historic heights. In 2020, the shipping and return of products within the e-commerce industry alone accounted for 37% of the total GHG emissions, attributing to the unsustainable habits of modern consumers and their appetite for convenience. It is estimated that by 2030, the number of delivery vehicles will increase by 36%, reaching approximately 7.2 million vehicles. This will not only result in an increase of about 6 million tons of CO₂ emissions, but it will also increase commutes by 21%, as vehicles



Global CO₂ emissions from transport

This is based on global transport emissions in 2018, which totalled 8 billion tonnes CO₂. Transport accounts for 24% of CO₂ emissions from energy.

Our World
in Data



▲ Figure 2: Global CO₂ emissions from transport, 2018

will take longer to travel due to higher traffic congestion. All things considered, the best way to drastically reduce the impact of the shipping industry is by rethinking the means of transport, for example, by prioritizing rail and marine vessels over truck drivers.

Emissions can also be reduced by using fuels with a minimal carbon footprint such as biofuels, renewable natural gas, hydrogen as well as sustainable aviation fuel. Lastly, it is the Governments' job to implement tighter fuel and vehicle emission standards. As part of its targets to reduce the net GHG emissions by 50% in 2030, the US has taken into account many sector-specific reduction pathways.

The Biden Administration is currently working on incentives for zero-emission personal vehicles, funding for charging infrastructure and support for research in low carbon, new-generation renewable fuels. Simultaneously, sixteen states including California, New York and Pennsylvania, are imposing their own pollution limits on cars. Similarly, the European Union is encouraging the production of greener vehicles and it has recently strengthened the CO₂ standards for cars and vans as a way to facilitate its phase-out of internal combustion engines.

Adopt a more sustainable approach to agriculture

Recent data from the Food and Agriculture Organization (FAO) shows that 31% of human-caused GHG emissions originate from the world's agri-food systems. From the 16.5 tons generated in 2019, the largest share - 7.2 billion tons - came from within the farm gate, 5.8 billion tons from the supply-chain processes, while 3.5 billion tons from land use change.

Thus, efforts to address the exploitation of resources like land and water as well as the promotion of sustainable agriculture are among the most crucial steps in air pollution prevention. A big issue related to soil depletion is the excessive use of fertilizers. Switching to nitrate-based solutions can be one of the easiest fixes in reducing farms' impact on air pollution. Israel has made incredible technological advances and managed to reduce the overconsumption of water through drip irrigation, a system that delivers water and nutrients directly into the plant's root through pipes. The technology is now being used in some African countries as well, thanks to funding from the World Bank. Lastly, countries like Australia have found ways to reduce agricultural methane emissions from farming by modifying the diets of livestock.

Introduce a carbon tax system

A carbon tax is an instrument of environmental cost internalization, imposed on producers of raw fossil fuels based on the relative carbon content of those fuels. Governments usually set a fixed price that emitting companies must pay for each ton of GHG emissions they emit. So far, 27 countries have implemented a carbon tax system as a way to incentivize polluters to lower emissions or switch to more efficient processes and cleaner fuels. At the same time, the carbon tax is a great way to reduce air pollution and GHGs generated from the same human activities and it is thus a good way to hit two birds with one stone.

Improving air quality while fighting climate change

Finally, air pollution can be prevented by tackling climate change. These two phenomena are closely intertwined, and neither can be seen exclusively as the cause or the effect. While deteriorating air quality is a consequence of climate change, air pollution also contributes to worsening global warming. That is why the climate crisis cannot be left out of the equation. Effective efforts to tackle climate change would significantly reduce deforestation and wildfires, two of the main sources of air pollution. Air quality and climate change are just one example of causes and effects overlapping. Therefore, the best shot for Governments around the world to reduce air pollution is to implement broader policies that aim at tackling all aspects of the looming climate crisis ■

ANH ĐỨC



How is Sweden successfully turning waste to energy?

Today, landfills take in more than half of the world's waste worldwide. One of the biggest environmental threats they pose is the production of greenhouse gases such as carbon dioxide and methane, speeding up global warming. Often described as the world's most sustainable country, Sweden has been setting an example for other nations with its renewable energy generation and emissions reduction. When it comes to waste, Sweden's solution was a complete revolution of its waste management system. By turning all its waste to energy, the Scandinavian nation is now able to keep its landfills empty while powering homes and buildings.

Landfills are responsible for the release of toxins and harmful substances into the atmosphere. In the US, they are the third-largest source of anthropogenic methane emissions - a gas 25 times more potent than carbon dioxide. Methane alone accounts for nearly 15% of the country's total emissions and is associated with air and water pollution as well as biodiversity loss and land degradation. According to the International Solid Waste Association (ISWA),

40 percent of worldwide waste ends up in open, uncontrolled dumpsites. As many as 38 of the 50 largest landfills threaten to pollute the sea and coastal areas, while 64 million people are directly affected by them, often with severe health problems. Perhaps worst of all, landfills' decomposing trash spews climate-altering methane into the atmosphere. "At the current rate, at least 10 percent of global greenhouse gas emissions will come from the world's landfills by 2025", reports the ISWA.

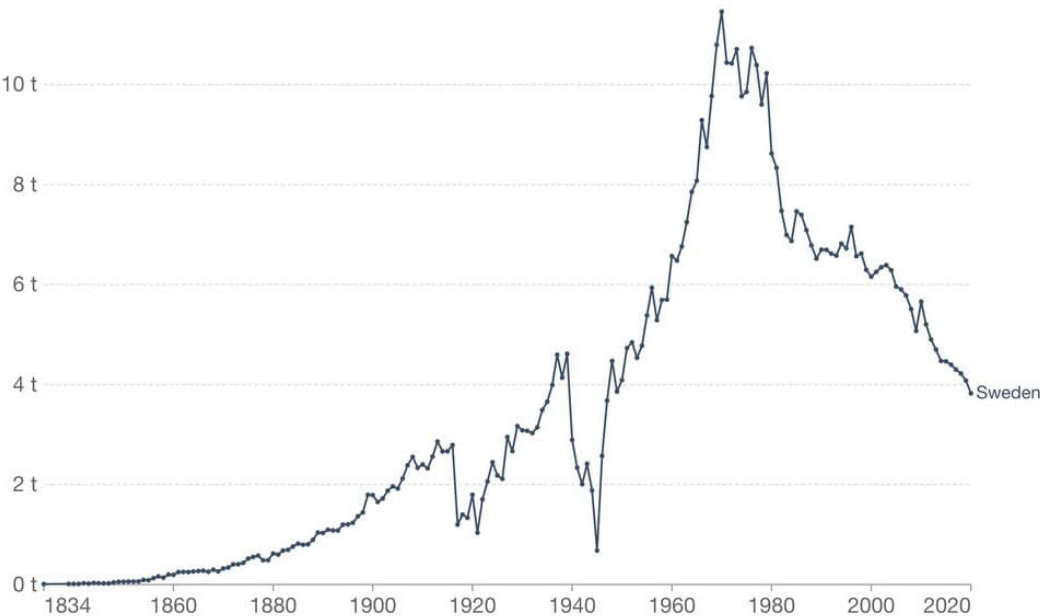
On average, nearly 60% of the world's waste ends up in landfills. Yet, in Sweden, it accounts for just 1%. We explore what makes the country's recycling system so successful and ways in which the Government deals with all its waste.

Sweden - the world's greenest country

When it comes to net-zero transition leaders, Sweden often immediately comes to mind. The Scandinavian country does not only have the highest renewable energy usage in the European Union - with approximately 56% of the energy coming from renewable sources such as hydroelectric, wind and nuclear power - but it also has some of the world's lowest carbon emissions thanks to a shift to electric transportation as well as extensive investments in smart technologies and urban farming. According to the World Bank, every year, the average American releases almost four times as much CO₂ into the atmosphere as the average Swede.

Per capita CO₂ emissions

Carbon dioxide (CO₂) emissions from the burning of fossil fuels for energy and cement production. Land use change is not included.



Source: Our World in Data based on the Global Carbon Project

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY

▲ Figure 1. Sweden's CO₂ emissions, 1834 - 2020



But there is another reason why Sweden is often described as the world's greenest country. Within few decades, the country has completely revolutionized waste management, drastically increasing its recycling rate and investing in technologies to turn its waste into energy.

How is Sweden dealing with its waste?

Since the 1990s, the Swedish Government has implemented a series of effective policies aimed at reducing waste generation, raising awareness among

manufacturers and citizens as well as drastically cutting emissions. After passing a policy to make producers responsible for handling all costs associated with the collection and disposal of their products, otherwise known as the Extended Producer Responsibility (EPR), Sweden has targeted households by applying a weight-based waste charge in a bid to incentivize recycling. Furthermore, national laws that ban the landfilling of combustible and organic waste, along with more stringent standards for hazardous waste, landfill and incineration imposed by the European Union on all its member states allowed Sweden to drastically reduce emissions and total landfill waste. Since 1975, its recycling rate has jumped from 38% to a staggering 99% and the country is now on track to reach its zero-waste goal.

Despite an average of 467kg of waste per person and nearly 4.4 million tons of household waste being produced each year, high public awareness of the benefits of recycling as well as an efficient collection system are the keys to the country's success. According to the Swedish Waste Management Association, in 2020, 87% of PET plastic bottles and 87% of aluminum cans as well as 61% of all packaging material were recycled. Furthermore, nearly 50% of household waste was turned into energy through an approach known as waste - to - energy (WTE).

The process starts with households and businesses, who filter waste into hazardous and recyclable materials, separating food waste, packaging of metal, plastic, paper and glass, newspapers, electronics, tires, and batteries. To encourage everyone to do their



▲ Sysav Power Plant in Malmö (Sweden)

part, Sweden built waste collection stations within 300 meters of all residential areas. While a part of this trash goes into recycling and incinerators, nearly half of it - usually comprising a mixture of energy-rich materials such as paper, plastics, and biomass - is brought to a WTE facility where it is turned into electricity. Similarly, food waste in Sweden is converted into climate-friendly biogas used to run public buses and heat apartment buildings. But local solid waste is not the only source feeding Sweden's 34 WTE plants. The country also imports nearly 800,000 tons of waste from the UK, Norway, Italy and Ireland. These plants currently supply nearly 1.5 million households with heat and approximately 780,000 with electricity - impressive figures considering that the total population of Sweden is around 10 million.

Circular economy as the main strategy for Sweden's transition

Circular economy is an extremely effective tool to reduce resource use within a society while simultaneously cutting the environmental impacts that follow from it. Sweden's recycling efforts as well as its solutions to keep trash out of landfills and instead, convert it into clean energy are not only a smart alternative with a less environmental impact, but they also allow the exploitation of resources that would otherwise be wasted. According to Sweden's Waste Management Association, despite emitting carbon dioxide and being associated with the release of persistent organic pollutants in the surrounding atmosphere, WTE power plants are still one of the best available technologies for treating and utilising the energy in different residual wastes that are more challenging to recycle. With other European countries such as the UK, Lithuania, Poland, Ireland and Spain starting to rely on WTE plants to generate a small part of their energy, Sweden's successful approach serves as an example of how sustainable solutions can effectively help reach a net-zero economy ■

HOÀNG ĐÀN



Valued scientific findings on biodiversity in Vũ Quang National Park in 2021

MSc. THÁI CẢNH TOÀN

Deputy Director of Vũ Quang National Park

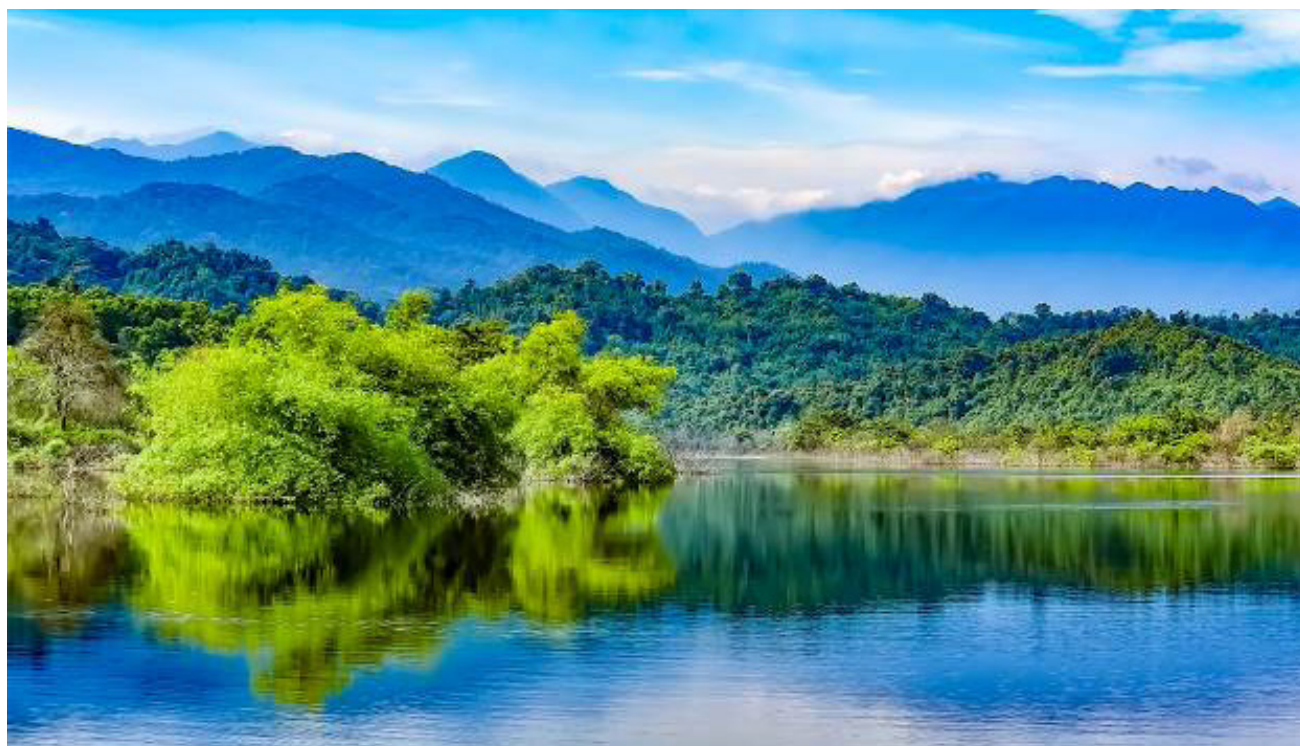
Vũ Quang National Park (NP), Hà Tĩnh Province was established under Decision No. 102/2002/QĐ-TTg dated 30/7/2002 of the Prime Minister. This place is known as the center of biodiversity of Việt Nam and preserves many valuable genetic resources for conservation. The NP is located in an ecological zone of global priority, identified as extremely important in biodiversity conservation for the entire Trường Sơn Range.

Vũ Quang NP is well-known to world conservation communities where two new mammal species for science were discovered and announced in the early 90s, that are Saola, also known as “Asian Unicorn” (*Pseudoryx Nghetinhensis*) and Mang lon (*Megamuntiacus vuquangensis*). These findings have shocked conservationists internationally and the discovery of new species for this science is a globally significant event in the history of biology. Consecutively in the nineties, scientists found in the streams of the Vũ Quang Forest’s 5 new species of fish for science, including: Lá Giang (*Parazacco*

vuquangensis); Chuồn sông (*Crossocheilus benasivuha*); Cá Bướm (*Pararhodeus philantropus*); Đông chấm sọc (*Puntius equalitus*); Chiên thác bệt (*Oreoglanis libertis*) and 3 species of Algae: *Diphyscium tamsii*, *Cololejeunea vuquangensis* and *Cheilolejeunea streimannii*. The new species mentioned above are all endemic to the Central Trường Sơn region, but were discovered, described and published for the first time in the habitats of Vũ Quang Forest. This area is so blessed with the discovery of new species that foreign experts and journalists once said: “Vũ Quang is Vietnam’s new species mine!”. Perhaps this simile is not “personified” because, in addition to “the charm” of discovering new species, the mountainous area of Vũ Quang NP is an area with a very high level of biodiversity and has hidden scientific and practical value which is very large and unexplored.

Biodiversity value in Vũ Quang NP

Vũ Quang NP has great biological value, because it is one of the last habitats of a number of species important for conservation and because of its very high biodiversity. In Vũ Quang NP, there are many species endemic to both Việt Nam and Laos. Among them are typical and rare species such as Saola (*Pseudoryx Nghetinhensis*), Giant muntjac (*Megamuntiacus vuquangensis*), Annamite striped rabbit (*Nesolagus timinski*), (*Migalus owstoni*),



▲ Natural scenery at Vũ Quang NP (Hà Tĩnh Province)



Brown-shanked douc (*Migalus owstoni*), Pygathrix nemaeus), Northern white-cheeked gibbon (*Hylobates leucogenys*), Vietnamese pheasant (*Lophura hatinhensis*), Horned Pit Viper (*Trimeresurus cornutus*), Vietnamese mossy frog (*Theloderma corticale*)...

According to the assessment of domestic and foreign experts, the diversity of flora and fauna in Vũ Quang NP is not inferior to any other area in the same territory. Regarding flora in Vũ Quang NP, 1,829 species of higher vascular plants of 813 genera with 202 families have been identified, of which there are 131 endangered and rare species listed in the Vietnam Red Book (2007), IUCN List (2017) and Government Decree No. 06/2006/ND-CP. The fauna of Vũ Quang NP is even more remarkable, studies have recorded the presence of 94 species of mammals belonging to 26 families, 315 species of birds, 58 species of reptiles, 31 species of Amphibians and 88 species of bony fish species, 316 butterfly species, 73 ant species and 28 spider species. In which, there are 46 species of mammals, 21 species of birds, 20 species of reptiles, 2 species of amphibians and 1 species of bony fish on the IUCN 2017 List and the Vietnam Red Book 2007 that need to be prioritized for conservation. The discovery and announcement of a series of new species to the world in recent times such as: *Homa-*

lium glandulosum (2016); Vũ Quang Camellia (*Camellia vuquangensis*), Hà Tĩnh Camellia (*Camellia hatinhensis*) (2018); Vũ Quang Lithocarpus (*Lithocarpus vuquangensis*) (2018); Vũ Quang Ginger (*Zingiber vuquangense*) (2019); Vũ Quang Neolitsea (*Neolitsea vuquangense*) (2019) has confirmed the richness, uniqueness and potential of biodiversity here. The region is not only on a nationally but also globally importance for conservation.

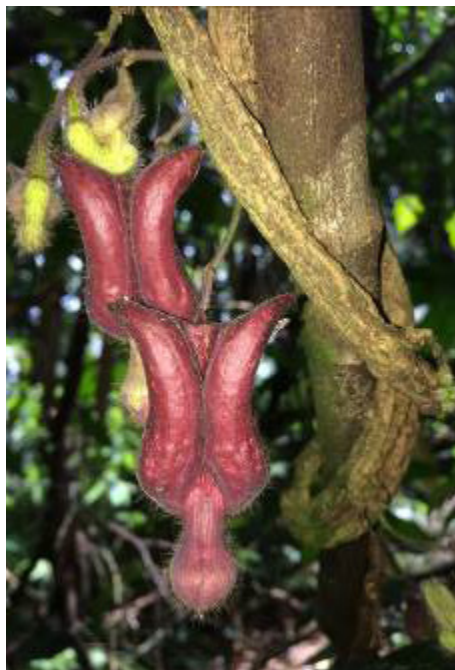
Outstanding scientific findings on biodiversity in 2021

The discovery of new species of organisms for science is no longer strange to researchers when it comes to Vũ Quang NP, only in 2021, where domestic and foreign scientific researchers have continuously discovered and announced 4 new species to the world.

Species “*Aristolochia vuquangensis*”: In the joint biodiversity investigation program between Vũ Quang NP and Vietnam Museum of Nature in mid-2018, the research team discovered a vine species with a very unusual floral structure, which previously hasn't been uncharacterized, has been identified in the genus *Aristolochia* of the family Aristolochiaceae but cannot be described because of the lack of important data. The collection and addition of data as well as the completion of the manuscript is carried out in the period until 2021. The new species for science is named *Aristolochia vuquangensis* (Mộc Hương Vũ Quang) published in the International Scientific Journal - Specialized in Phytotaxa 500 (1): 037 - 044 in 2021.

This is the 8th new species of the subgenus *Siphisia* of the family Aristolochiaceae discovered and described in Việt Nam during the past 7 years and the 2nd species of this subgenus to be discovered in Central Việt Nam. Particularly for *Aristolochia vuquangensis*, the research

team has only recorded their occurrence in Vũ Quang NP with a very narrow distribution area of about 4km² with a very small number at 1,200m in the area adjacent to the Vietnam - Laos Border. *Aristolochia vuquangensis* was submitted by the research team to the International Union for Conservation of Nature (IUCN) for conservation level CR (Critically Endangered) because it was found that the existence of this species was soon threatened by various factors of climate change in the region.



▲ *Aristolochia vuquangensis*



Species “Vũ Quang Dwarf Frog”: This is the result of a research collaboration between Vũ Quang NP, Vietnam Museum of Nature and experts from Russia, Germany and China.

The species “Vũ Quang Dwarf Frog” was described as a new species to science based on morphological and molecular genetic analyzes. *Vietnamophryne vuquangensis* was named after the place “Vũ Quang” where this frog was discovered, according to the agreement of the author group and the aspirations of the German researcher - Dr. Thomas Ziegler. Mr. Ziegler has researched and contributed to the biodiversity database for Vũ Quang NP more than 20 years ago. The choice of a name for the new frog species “Vũ Quang Dwarf Frog” is seen as a tribute to Mr. Ziegler after he returned to the place where he used to be.

The newly described species of “Vũ Quang Dwarf Frog” brings the total number of species in the genus known today to 4 species. So far, according to research, the species “Vũ Quang Dwarf Frog” has only been recorded in Vũ Quang NP and has not been found in any other areas. The results of this study were published in the specialized scientific Journal *Revue suisse de Zoologie* (March 2021 issue) titled “A new species of Vietnamophryne frog from Việt Nam”.

Species “Beilschmiedia Danhkyii”: The result of the cooperation in scientific research between Vũ Quang NP, the Vietnam Institute of Ecology and Biological Resources and experts from Japan. According to the research results, a new plant species with scientific name *Beilschmiedia Danhkyii* belongs to the plant family Lauraceae, one of the most diverse families in terms of species composition in Việt Nam as well as in Vũ Quang NP with values of medicinal herbs and oils.

The species nomenclature *Beilschmiedia Danhkyii* is named after Mr. Nguyễn Danh Ký, Director of Vũ Quang NP, a passionate individual who made great contributions to scientific research and biodiversity conservation



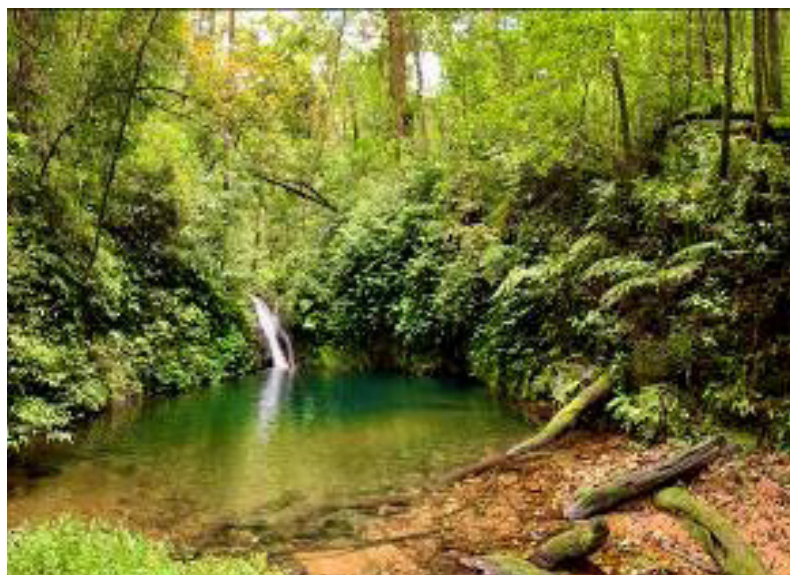
▲ *Vũ Quang Dwarf Frog*
(*Vietnamophryne vuquangensis*)

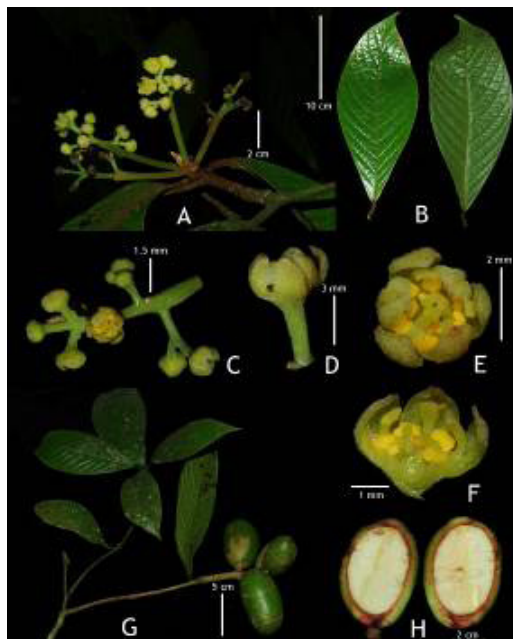
in Vũ Quang NP during the period as well as assisting the research team in the collection and discovery of this new species.

Also, according to the research team, the species “*Beilschmiedia Danhkyii*” is located in the area of Vũ Quang NP, with broad-leaved primary forest habitat distributed at an altitude of 80 - 170m above sea level. Occurrence range (EOO) is 0.059km² and fill



▲ *Chlorogomphus Danhkyi* and its natural habitat





▲ *Beilschmiedia Danhkyii*



area (AOO) is 8km², based on the criteria of the International Union for Conservation of Nature (IUCN) (2021), the species was assessed by the research team and recommended as Critically Endangered (CR) C2a (ii). The content and research results of the new species *Beilschmiedia Danhkyii* were published by the authors in the International Journal of Phytotaxa (Q3 No. 527) December 12, 2021.

Species “Dragonfly Danhkyii”: This research was carried out by researchers from Duy Tân University (Đà Nẵng), Kanagawa Museum of Natural History (Japan) and professional staff of Vũ Quang NP.

This new species was discovered at an altitude of 1,500m above sea level creating Vũ Quang NP with a characteristic climate of humid and low temperatures all year round. The nomenclature of the species “*Chlorogomphus Danhky*” was unanimously chosen by the research team after Mr. Nguyễn Danh Kỳ - Director of Vũ Quang NP, because of his contributions to the development of the NP and the conservation of biodiversity here. The research results have been published in the specialized scientific Journal Zootaxa in 2021.

With the values of biodiversity and importance for conservation, Vũ Quang National Park is recognized as “ASEAN Heritage Park” by the Association of Southeast Asian Heritage Parks (ASEAN). And this event is also one of the 10 outstanding events of the natural resources and environment industry approved by the Minister of Natural Resources and Environment in 2019. ASEAN Heritage Park is the title of nature conservation and biodiversity of the Association of Southeast Asian Nations (ASEAN). It has been implemented since 2003 with the aim of comprehensively conserving important and unique natural ecosystems of the ASEAN region with the participation and signing of ASEAN’s Environment Ministers. The recognition of the title of ASEAN Heritage Park makes an important contribution to the conservation of an ecosystem that not only has high biodiversity but also has cultural and historical value for each country and the whole region. At the same time, contributing to raising the awareness of biodiversity conservation among the people of ASEAN countries.

Today, Vũ Quang NP, in addition to the tasks and functions that have been performed and are being performed, also shoulder the responsibility of being an important biodiversity conservation area and natural ecosystem, unique to the ASEAN region. Contributing to enhancing the role, position and prestige of Việt Nam at the regional and continental level ■



Efforts to conserve Saola and wild animals in Vũ Quang National Park

Saola has the scientific name *Pseudoryx nghetinhensis*, known as “Asian Unicorn”, is one of the most endangered endemic large mammals in the world living in the Trường Sơn mountains in Việt Nam and Laos, classified as endangered in the International Union for Conservation of Nature (IUCN) Red List of threatened species and in the Việt Nam’s Red Data Book.

This animal was discovered for the first time in the world in Việt Nam in May 1992 in a survey conducted by the Ministry of Forestry of Việt Nam and the World Wildlife Fund (WWF) in Vũ Quang National Park (NP), Hà Tĩnh Province. The team had found a skull with unusually long and straight horns in a hunter’s house and knew it was something of a miracle. To date, no biologists have seen Saola

in the wild with the naked eye. However, the rare wild images of this species are possible thanks to the camera trap system set up by conservationists in the forests of Laos and Việt Nam.

The discovery of Saola in Hà Tĩnh in 1992 shocked the world, it is one of the most spectacular zoological discoveries of the 20th Century because scientists believe that the discovery of large mammals in this moment is “unlikely”.

Saola has a length of about 1.3m to 1.5m; is 0.9m tall and weighs about 100kg. It has dark brown fur, the Saola’s horns are long and slender, pointing straight back and can be up to 51cm long. Scientists believe that Saola is one of the indicator species of the primeval forest, which has not been affected by humans. Because they are very sensitive, their long horns are easily threatened, so they cannot live in the compromised forest.

In November 2020, the work Saola by Painter Ngô Xuân Khôi was selected as the mascot of the 31st SEA Games held in Việt Nam. Painter Ngô Xuân Khôi said that the reason he chose this animal as a symbol is because Saola is not only the soul of the Trường Sơn Mountain range, a Rare and endangered animal, but

also the image of Saola means friendly, agile and vivacious, suitable for the nature of sports and characteristic of Việt Nam. Through the selection of Saola as the mascot of the 31st SEA Games, friends in the region and the world have the opportunity to know more about the very special values that nature has bestowed on Việt Nam.

It is because of the rarity and mystery of Saola that few people know the urgency of protecting the last of the Saola, as well as the importance of devoting resources to conservation before this species completely disappeared. Then Việt Nam will lose one of its biodiversity symbols.



▲ A picture of 2 Saola individuals discovered between 1992 - 1997 in Vũ Quang NP



“The Saola symbolizes all the important things that are now at stake. If we can save Saola, we will save the forest landscape, biodiversity and ecosystem benefits, like the fresh-water we depend on. Therefore, this is not simply a fight to protect an endangered animal. This is a fight to save nature, ecological benefits, community livelihoods, and all that the Saola stands for”, said Dr. Văn Ngọc Thịnh, Country Director of WWF- Việt Nam.

In recent years, Vũ Quang NP - where the world's first Saola species was discovered, has

actively implemented many activities to conserve biodiversity such as: forest patrol at the root, coordination with functional agencies in the area to carry out activities to prevent exploitation, hunting and trade of wild animals, receive individuals of wild animals handed over by organizations and individuals to rescue and restore their natural instincts to



▲ Mr. Văn Ngọc Thịnh - WWF-Việt Nam Country Director presents the Saola image to Minister of Natural Resources and Environment Trần Hồng Hà

re-release them back into the wild. Along with that is the propaganda and education to raise people's awareness about forest protection - biodiversity conservation such as: Propagandize and popularize the legal provisions to the villages for the people; organize environmental education activities for school children in buffer zones and neighboring residential areas. In addition, the Scientific Research Section of the



▲ Saola research and conservation station in Vũ Quang NP



Park has coordinated with organizations and research institutes to carry out a number of activities to investigate and survey species such as reptiles, amphibians, primates... set up a standard area of forest to monitor the changes of forest resources. The coordination between Vũ Quang NP and functional agencies, bordering units and local authorities of the three districts of Hương Sơn, Hương Khê and Vũ Quang is carried out regularly and effectively. In addition, the Park also signed a Memorandum of Understanding with the Nakai Nam Theun NP of Laos to exchange information, well perform the work of cross-border biodiversity conservation and develop and expand the surrounding area.

However, there are still many activities of the NP that need support from the State and social organizations to protect the status quo of Vũ Quang NP, such as conducting survey and monitoring activities for precious and rare plant and animal species of ungulates such as Saola, *Muntiacus vuquangensis*...; primates such as white-cheeked gibbon, Siki gibbon, brown-shanked douc..., surveying Asian elephants in Vũ Quang NP and proposing conservation options in the area ■

THÁI TOÀN



The Southeast Asian Games 2021 (SEA Games 31) hosted by Việt Nam from 12 to 23 May 2022 chose Saola as the mascot created by Painter Ngô Xuân Khôi. Saola is known as “Asia’s Unicorn” because of its mysterious beauty and rarity not only in Việt Nam, but also in other countries in Asia.

Not only bearing the symbol of uniqueness, Saola’s V-shaped horns also indicate two great meanings, namely the word “Việt Nam” and the word “Victory”. Saola is also known as an animal that possesses toughness and endurance. The well-proportioned body and stocky muscles are also the features that make this animal so impressive. This is also considered a reminder of the Vietnamese sports delegation full of desire to win, ready to compete for the gold medals against regional rivals.

Saola is classified as “Critically Endangered” in the IUCN Red List of Threatened Species, which is the last level before being listed as “Extinct”.

More than a mascot, the Saola image at the 31st SEA Games is a call for awareness of environmental protection, condemning deforestation, illegal animal trapping and a call for more investment to protect the last remaining Saola on Earth.



Bãi Mầu Water Coconut Forest - Green Paradise

Bãi Mầu is a unique ecoregion with mangrove forest system, stretching over one hundred hectares stretching along the North bank of Thu Bồn River, which is adjacent to Cửa Đại Beach, in Cẩm Thanh Commune, Hội An City, Quảng Nam Province. Bãi Mầu Water Coconut Forest is 3km from Hội An ancient town to the East.

Coming to the resort, sitting on small round baskets, wearing beautiful leaf hats, visitors will have an interesting experience, discover the beauty of water coconut. Skillful paddle boaters will bring tourists through the coconut trees, in the cool blue water. This Water Coconut Forest is home to many of the underwater and terrestrial animals such as crabs, shrimps, fishes..., visitors can catch and catch crabs, small fronds close to the roots. dense coconut water. Tourists can access the basket boat into an optional place to relax, breathe fresh air and take pictures, film with relatives in the widespread canopies and watch the coconut water, coconut trees sprouting in the

sun. Guests will enjoy and have a moment of interesting practical experience when the rowers train them themselves to perform a basket boat, shake the circle, kick the basket, watch the art of throwing fishing nets and shape themselves. cute flowers and animals from young coconut



▲ Bãi Mầu Water Coconut Forest view from above



▲ Experiential activities in the Coconut Forest

leaves... More specifically, visitors enjoy rustic folk tunes, listen to Cẩm Thanh girls sing hut songs..., typical culture of Quảng Nam land.

Here, visitors also have opportunity to participate in folk games: dams, tugs, team sandals, go climbing, fishing by the lake... or relax on the hammocks between dreamy space quiet, cool view overlooking the scenery of coconut forest... Enjoy the local specialties■

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- Manage funding sources to support cooperation and investment promotion, technology transfer in the field of environmental infrastructure development and new energy (water supply, wastewater treatment, renewable energy, emissions management, ...);

- Support Korean and Vietnamese enterprises to promote investment in the field of environmental industry in Vietnam;

- Research and explore the technology market in order to serve the promotion and cooperation development, investment and technology transfer in the field of environment and sustainable development.



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