


# ESG 글로벌 동향과 대응 : 네이처 포지티브

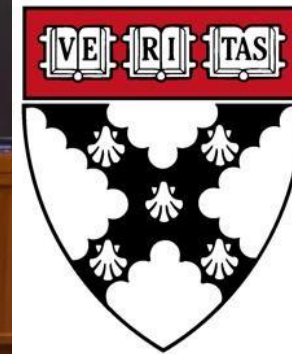
옥용식  
고려대학교 HCR 교수  
국제ESG협회 회장

## BUSINESS & ENVIRONMENT

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### What is the Business & Environment Initiative? →

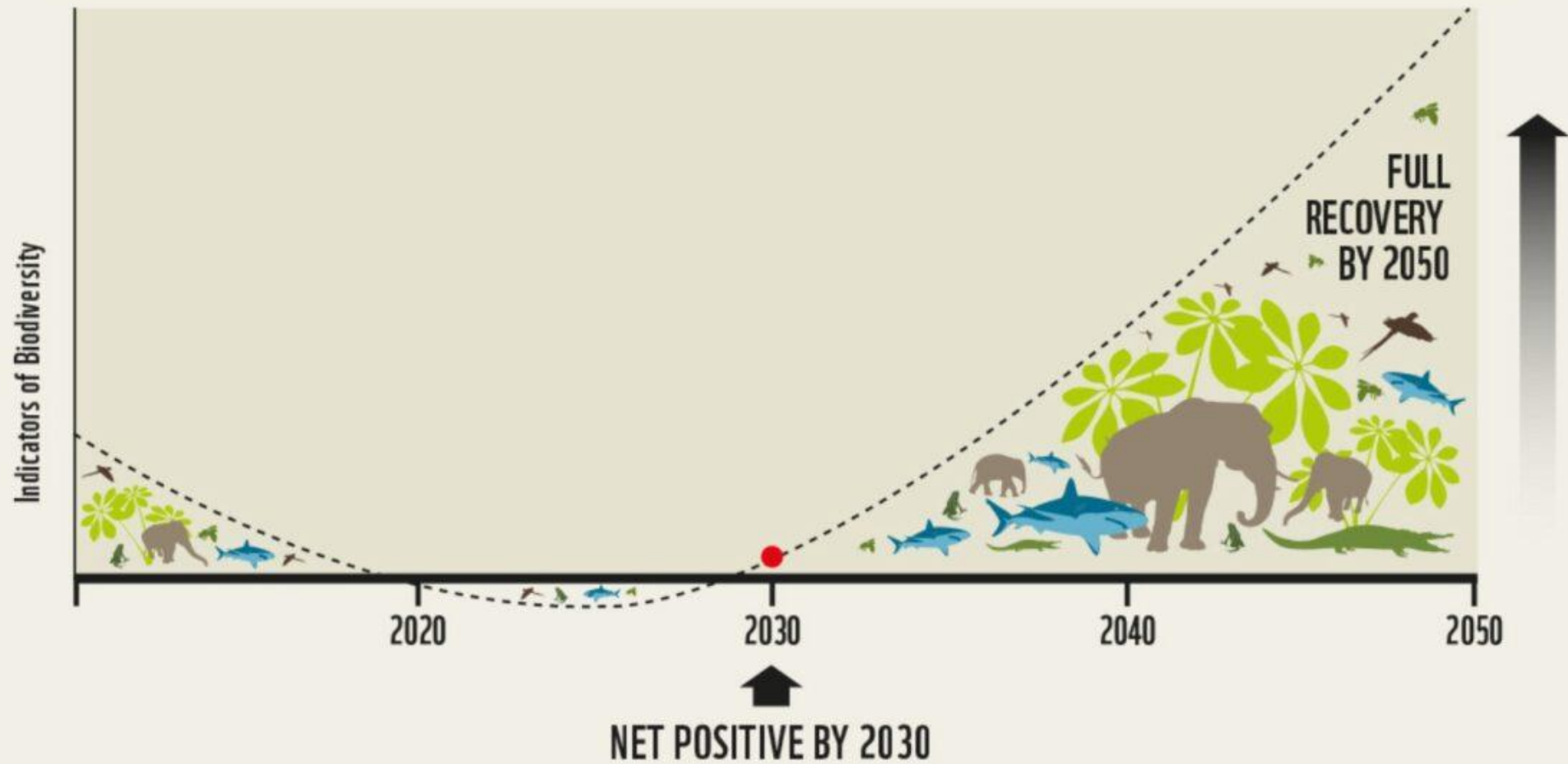
Inspiring innovation and action at the intersection of business and environment



## Harvard Business Review

**Net positive companies propose solutions rather than wait for (or complain about) regulations that tell them what to do. The system is healthier and stronger for their efforts.**

# Nature Positive by 2030



Yong Sik Ok\*, Kengo Kuma, June Young Kwak, *Cloud Walkers Pictorial Record*, LEEUM, 2023, Responsible Consumption and Production for Sustainable Future, pp. 130-145

- Goal to shift global finances away from nature-negative outcomes **towards nature-positive** ones
- Sceptics question need for more data and say **only new laws will ultimately prevent biodiversity loss**
- David Craig said: "This is a clear sign that investors, lenders, insurers and companies are recognising that their **business models and portfolios are highly dependent on both nature and climate and need to be treated as both strategic risks and investment opportunities.**"

Land Use & Biodiversity | Industry Insight | Nature-based Solutions | Regulatory Oversight

## Analysis: New nature-based frameworks keep biodiversity in spotlight at Davos

By Mark Hillsdon

January 25, 2024 10:16 PM GMT+9 · Updated 6 months ago



Industry Insight from Ethical Corporation Magazine, a part of Thomson Reuters.



A view of a logo during the 54th annual meeting of the World Economic Forum, in Davos, Switzerland, January 19, 2024. REUTERS/Denis Balibouse [Purchase Licensing Rights](#)



Taskforce on Nature-related  
Financial Disclosures



# TNFD Adopters

*As of 30 June 2024*



## Total Adopters

416

## Increase since Davos



Increase in  
total Adopters



Increase in  
Market Cap

## Total market breakdown

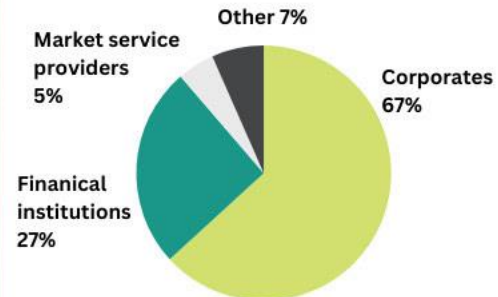


Of the MSCI  
1500

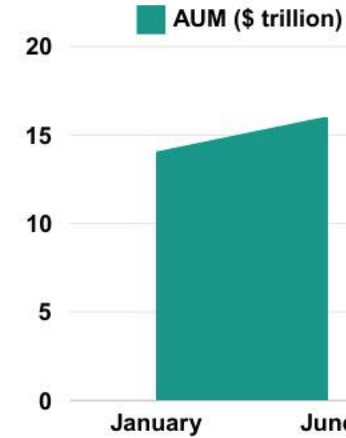
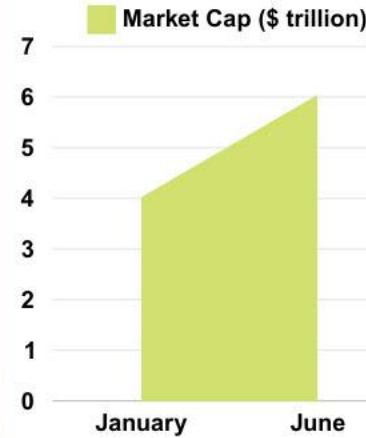


SICS Industries  
covered

## Total Adopters by organisation type



## Global Market Capitalisation and Assets Under Management



Global Market  
Capitalisation

**\$6tr**

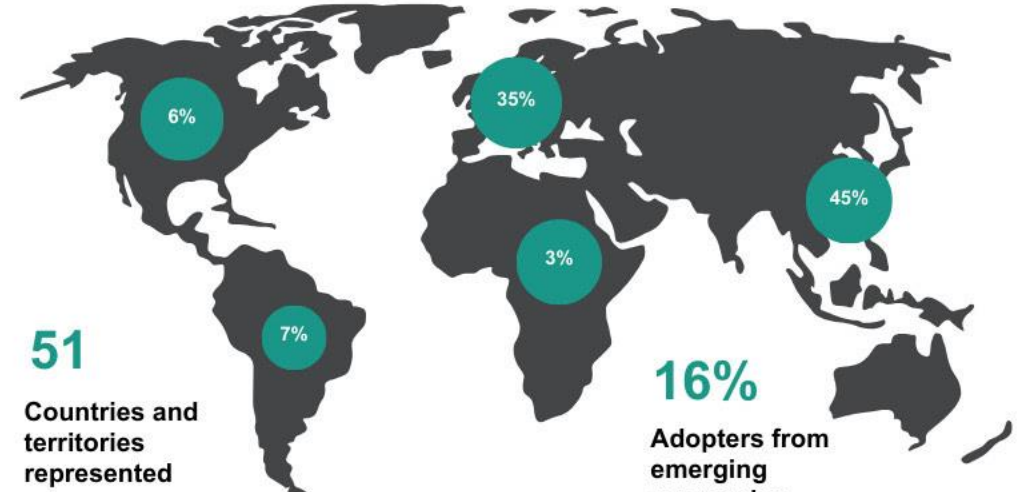
51% increase since January

Global Assets Under  
Management

**\$15.9tr**

13.5% increase since January

## Regional breakdown



51

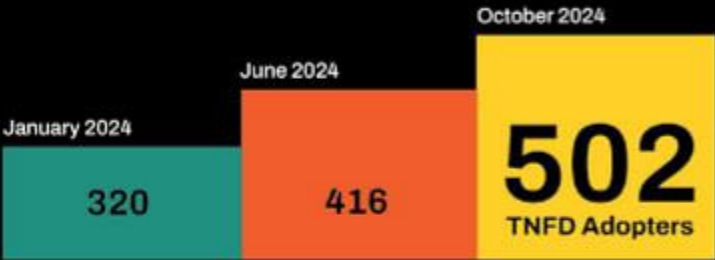
Countries and  
territories  
represented

16%

Adopters from  
emerging  
economies

# TNFD Adopters

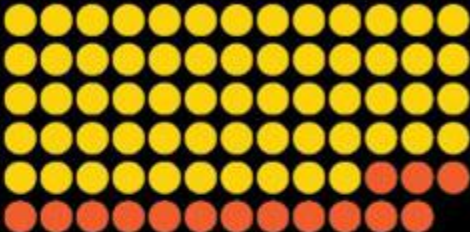
## 57% Increase in Adopters since January 2024



## Financial year Adopters to start reporting



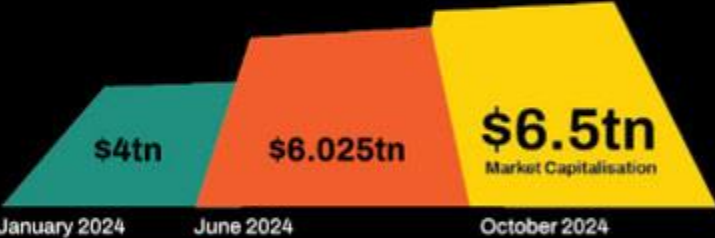
## 62 out of 77 SASB SICS industries covered



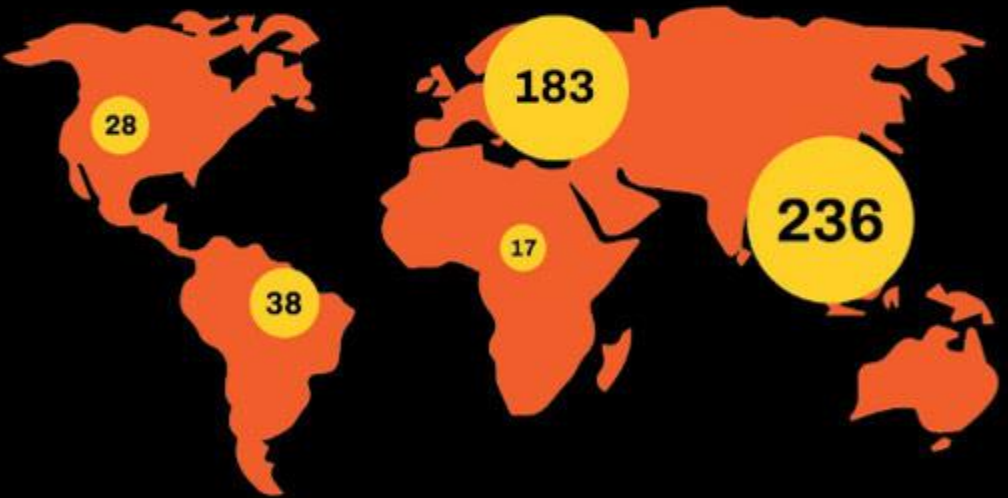
## Organisation type



## 63.2% Market cap increase since January 2024



## Adopters by region



## MSCI 1500



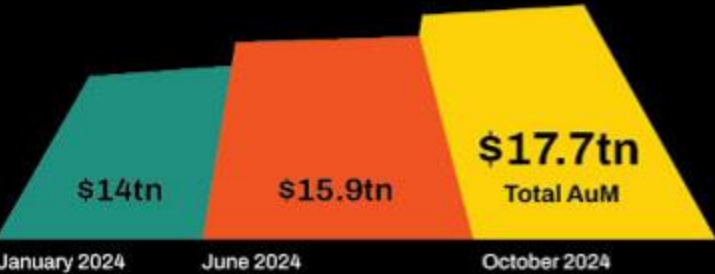
of Adopters are MSCI 1500 listed companies

## G-SIBs



of the Global Systemically Important Banks (G-SIBs) are TNFD Adopters

## 26.2% AuM increase since January 2024



Organisation and Jurisdiction HQ	TNFD-aligned disclosure(s) by financial year	Sector Classification (SASB)	Type of Institution
<b>Hankook Tire &amp; Technology</b> <b>Early Adopter</b>  Korea (the Republic of)	2025	Auto Parts	Corporate
<b>Hanwha Life Insurance</b> <b>Early Adopter</b>  Korea (the Republic of)	2025	Financials	Financial Institution
<b>Industrial Bank of Korea</b> <b>Early Adopter</b>  Korea (the Republic of)	2025	Commercial Banks	Financial Institution
<b>International ESG Association</b> <b>Early Adopter</b>  Korea (the Republic of)	2025	Education	Academic-scientific
<b>SK Securities</b> <b>Early Adopter</b>  Korea (the Republic of)	2025	Investment Banking & Brokerage	Financial Institution

# Global ESG Forum underscores **biodiversity and ESG reporting as key drivers** to sustainable development

- **Biodiversity and nature positive reporting as the new ESG commitment:** IESGA and NUS Business School will provide comprehensive insights into the global ranking of companies in terms of biodiversity
- **Study reveals critical gaps remain in ESG reporting:** Stanford University, NUS Business School and the University of Oxford as well as the Secretary General of IUCN, will be present to discuss about nature positive business



Dr Amy Khor (Front row middle), Senior Minister of State for the Ministry of Sustainability and the Environment and the Ministry of Transport as the Guest of Honour





	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3	사명	주요 업종 (기타)	모형명 (영문)	GCSS 산업 부문 (생체역학)	GCSS 산업 부문 (신장학)	보조 기능	국적	GPU	SAR	TECP	UMI SD	K-ES	본문 (본문)	부위 (부위)	GR 30	GR 30	GR 30	GR 30	GR 30	GR 30	상세 기준 (GR)	내용	평가 방법	핵심요소 (생체역학)	비핵심요소 (생체역학)	유대(핵심/비핵심) 여부 (생체역학)	
4	삼성전자	Samsung Electronics	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자
5	삼성전자	Samsung Electronics	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자
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23	삼성전자	Samsung Electronics	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자
24	삼성전자	Samsung Electronics	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자	삼성전자
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# Biodiversity hotspots for conservation priorities

Norman Myers<sup>\*</sup>, Russell A. Mittermeier<sup>†</sup>, Cristina G. Mittermeier<sup>†</sup>, Gustavo A. B. da Fonseca<sup>‡</sup> & Jennifer Kent<sup>§</sup>

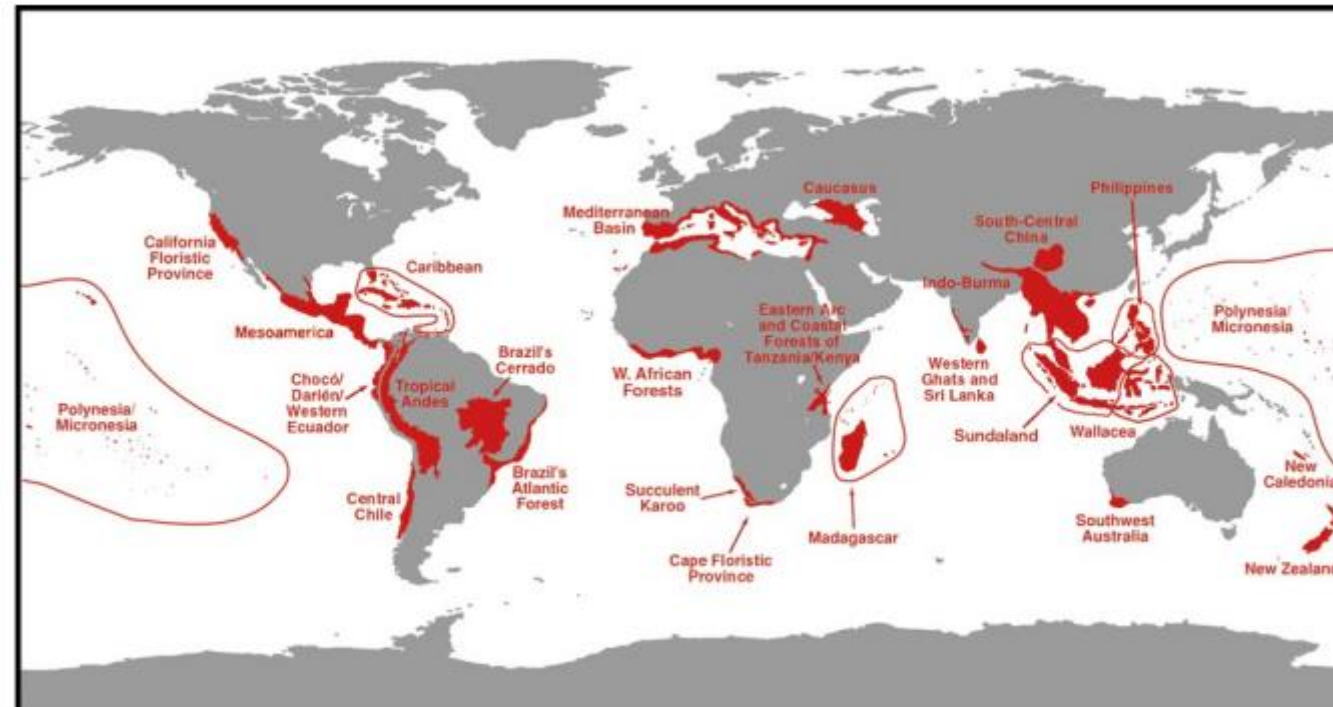
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Conservationists are far from able to assist all species under threat, if only for lack of funding. This places a premium on priorities: how can we support the most species at the least cost? One way is to identify 'biodiversity hotspots' where exceptional concentrations of endemic species are undergoing exceptional loss of habitat. As many as 44% of all species of vascular plants and 35% of all species in four vertebrate groups are confined to 25 hotspots comprising only 1.4% of the land surface of the Earth. This opens the way for a 'silver bullet' strategy on the part of conservation planners, focusing on these hotspots in proportion to their share of the world's species at risk.



**Figure 1** The 25 hotspots. The hotspot expanses comprise 30–3% of the red areas.



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	A	B	C	D	F	G	H	I	J	L	M	O
	Company Name	Current Global Fortune500	Biodiversity mention text	Biodiversity commitment quote	Scope of impacts - value chain	Committed to short term actions	SMART Milestones	SMART Reasoning	Positive contribution	Climate strategy date	Integration - Biodiversity & Climate KPIs	Fortune 100 Sector
1	Apple	Yes	Our priorities will focus on projects that protect lands	Apple is partnering with Conservation International and Komaza to invest in the micro-forestry model and its positive impacts on carbon removal, biodiversity conservation, and	Supply chain + operations	No	No - or not disclosed	-	CSR initiatives	2021	Mention of biodiversity co-benefits	technology
2	Hitachi	Yes	Providing products and services that contribute to	During R&D, estimating impact on biodiversity during a product's life cycle and implementing, if needed, mitigation measures	Value chain	No	No - or not disclosed	-	Scaled by impacts	2020	No mention of biodiversity in climate strategy	technology
3	IKEA	No	The world is experiencing a dramatic loss of	The world is experiencing a dramatic loss of species and ecosystems. The decreased genetic diversity represents, together with climate change, one of the greatest challenges	Value chain	Yes, clear pre-2030 milestones	Yes - comprehensive set of SMART targets	New forestry goals leading up to 2030 as part of the Forest Positive Agenda, launched January 2021 on page 47. • New goals will be set within Agriculture, Inorganics	Scaled by impacts	2020	Mention of biodiversity co-benefits	
4	Microsoft	Yes	In 2020, we committed to permanently	In 2020, we committed to permanently protect and restore more land than we use company-wide by 2025, using approaches like land acquisition, conservation easement,	Value chain	Yes, clear pre-2030 milestones	Yes - comprehensive set of SMART targets	In 2020, we committed to permanently protect and restore more land than we use company-wide by 2025, using approaches like land acquisition, conservation	Scaled by impacts	2020	Mention of biodiversity co-benefits	technology
5	Samsung Electronics	Yes	We are committed to minimizing the impact of our	"We are committed to minimizing the impact of our operation on biodiversity. In particular, we have consistently undertaken ecosystem protection activities, including the	Supply chain + operations	Stated ambition	No - or not disclosed	-	CSR initiatives	2021	No mention of biodiversity in climate strategy	technology
6	Sony	Yes	Sony focuses on protecting biodiversity in	Sony focuses on protecting biodiversity in business activities that can directly affect the local environment and biodiversity, such as the procurement of raw materials and	Value chain	Yes, clear pre-2030 milestones	No - or not disclosed	-	Scaled by impacts	2021	Mention of biodiversity co-benefits	technology
7												

David Craig said: "This is a clear sign that investors, lenders, insurers and companies are recognising that their **business models and portfolios are highly dependent on both nature and climate** and **need to be treated as both strategic risks** and investment opportunities."

# Water

## Strategy

As Samsung Electronics expands semiconductor lines in Korea, the amount of industrial water required for DS Division manufacturing sites in 2030 is expected to continue to grow from 2021 levels. In response, we have set a 2030 water intake reduction target aimed at reducing water consumption to 2021 levels and are striving to achieve this goal through various efforts, such as building wastewater reuse systems and signing agreements to reuse our treated sewage effluents. The DS Division will continue to work on minimizing our water resources impacts of Korean and global manufacturing sites.

### Expand Water Reuse

#### Establish Water Reuse System

- Maximize industrial water reuse rate through wastewater effluent reuse system and invest in new technology development
- Apply technology for wastewater by concentration levels
- Reuse concentrated wastewater generated during ultra-pure water production
- Develop membrane-based water reuse technologies

#### Utilize External Wastewater

- Expand water supply through agreements to expand wastewater reuse

### Reduce Water Use

- Optimize manufacturing process to reduce manufacturing use water
- Stop water supplies to non-active facilities
- Manage facility water use time
- Improve processes for facility operations

### Ecological Preservation

- Secure stream flows by release cleanly treated water
- Contribute to improving water quality and enhancing biodiversity

## Risk Management

The DS Division has established an ESG risk management system to identify ESG risks including for water resources. Key management risks based on monitoring and risk assessment are reported to executive management and ultimately applied to DS Division sustainability strategies.

Site	Water Stress Level
Korea (Giheung/Hwaseong/Pyeongtaek/Cheonan/Onyang)	Medium-High
China (Xi'an/Suzhou)	Extremely high
China (Tianjin)	Medium-High
United States (Austin/Taylor)	Medium-High

# No mention of biodiversity in climate strategy

## Water Risks and Opportunities and Response Strategies

The DS Division applied the WRI Aqueduct Water Risk Atlas, an internationally recognized water resources management framework and tool, to identify water resource risks<sup>1)</sup>. We identified 4 risks factors and 1 opportunity factor and establish response strategies by region accordingly.

1) Aqueduct Water Risk Atlas standard: Regions evaluated as High(3) based on metrics including water resource quantitative and qualitative data, regulation and reputation risk

### Water Risks and Response Strategies

#### Droughts, Water Outage

- Diversify water sources: establishment of emergency supply system capable of providing water from water suppliers; alignment with criteria set by water suppliers when evaluating water risks
- Calculate expected drought damage costs

#### Increases in South Korean Water Stress Index

- Annually review business site water stress/risk levels, detail risks and prepare response strategies accordingly

#### Water Resource Depletion, Pollution

- Participate in activities commemorating World Water Day to raise awareness of the importance of water
- Engage with local communities including joint activities for water risk prevention and river and marine ecosystem conservation with public, civic, and academic organizations in proximity to our business sites

#### Water Regulations

- Observe local environmental policies and regulations
- Maintain management standards at legal levels as well as rigorous internal levels

### Water Opportunities and Response Strategies

Secure comparative competitiveness through value chain water resources management support

- Annually monitor water use savings, share water use savings knowhow, and seek partner company cooperation through value chain water footprint management

## Ecological conservation

In order to secure the ecological health of discharging rivers and preserve their biodiversity, Samsung Electronics' DS Division has been conducting river monitoring and conservation activities since 2007 at Osan Stream, which activity has now been expanded to all worksites. Furthermore, we are in the process of establishing an ecological status map of areas under DS influence, which analyzes and evaluates the current status and impacts on the natural and ecological systems around the business sites in various ways, starting with the Giheung and Hwaseong sites in 2023.

### Stream Ecosystem Management

Korean sites regularly measure water quality indicators such as biological oxygen demand (BOD), total phosphorus (T-P), pH in discharge rivers, and biological indicators such as fishes, benthos, birds, and mammals in order to manage and monitor their impact on the ecosystem. Based on these monitoring results, we carry out activities to improve and preserve the natural environment and biodiversity.

### Freshwater Ecosystem Monitoring and Improvement

In order to protect the ecosystem and biodiversity of rivers near our sites, we regularly monitor the status of aquatic ecosystems (fishes, benthos, vegetation, etc.), terrestrial ecosystems (mammals, birds, etc.), water quality, vegetation, and biological habitats to identify impacts on the ecosystem in accordance with the Guidelines of the National Institute of Environmental Research.

National Institute of Environmental Research Notification No. 24-1, released in 2020.



### Woncheon-ri Stream-Hwangguji Stream, Hwaseong

- 8 families and 21 species of fish (dominated by freshwater minnows, crucian carp, common carp, and goby minnows)
- 37 families and 57 species of benthos (high proportion of aquatic insects)
- 1,369 counts of 34 bird species (Class II endangered wildlife bean goose spotted)
- 9 species of mammals (class I endangered wildlife Eurasian otter and class II endangered wildlife leopard cat spotted in Hwangguji Stream)
- Water flea acute toxicity test shows no ecotoxicity impact to streams from effluents

### Osan Stream, Giheung

- 12 families and 26 species of fish (dominated by crucian carp, common carp, bass, and freshwater minnows)
- 37 families and 55 species of benthos (high proportion of aquatic insects)
- 8,861 counts of 90 bird species (8 class II endangered wildlife including the common spoonbill, eagle, hawk, bean goose, and long-billed plover spotted)
- 5 species of mammals (class I endangered wildlife Eurasian otter, class II endangered wildlife leopard cat spotted)
- Otter gene survey<sup>1)</sup> confirmed existence of at least 4 Eurasian otters (3 male, 1 female)
- Water flea acute toxicity test shows no ecotoxicity impact to streams from effluents

<sup>1)</sup> Survey process: Collection of otter feces → Amplify mitochondrial DNA → Sequence analysis using genetic markers

### Seojeong-ri Stream – Jinwi Stream, Pyeongtaek

- 5 families and 15 species of fish (dominated by freshwater minnows, crucian carp)
- 23 families and 32 species of benthos (high percentage of aquatic insects)
- Water flea acute toxicity test shows no ecotoxicity impact to streams from effluents

### Gokgyo Stream, Onyang-Cheonan

- 8 families and 23 species of fish (dominated by freshwater minnows, goby minnows, and stone moroko)
- 34 families and 45 species of benthos (high percentage of aquatic insects)
- 684 counts of 34 bird species (Class II endangered wildlife long-billed plover, kestrels spotted)
- 9 species of mammals (class I endangered wildlife Eurasian otter, class II endangered wildlife leopard cat spotted)

### Jiaohe Stream, China

- 8 families and 21 species of fish (common carp, crucian carp, etc.)
- 53 families and 92 species of benthos (high percentage of arthropods)
- Ecotoxic luminescent bacteria composite toxicity test SOS/UMU genotoxicity testing shows no stream impacts from effluents

## Biodiversity Recovery and Conservation efforts

Osan stream near the Giheung site is fed with a daily average of 45,000 tonnes of purified effluents from our site, and the stream ecosystem has been restored to the point where otters (Class I endangered wildlife, Korean Natural Monument) now inhabit the area. In 2023, we conducted the first analysis using genes in otter feces and confirmed that at least four otters (three males and one female) live along Osan stream and discovered traces of various mammals such as leopard cats, raccoon dogs, and water deer. We also conducted removal of wildlife that disturbed the ecosystem and encouraged cooperation with local residents planted native riverside plants and cleaned up the stream.

The Hwaseong site has featured a natural area of approximately 290,000 m<sup>2</sup> in the vicinity of Donghak Mountain Conservation Forests (46,000 m<sup>2</sup> of natural forest) within the site. In accordance with the Korean Environmental Impact Assessment Act, the site preserved a percentage of the natural area in consultation with the project approval agency and created ecological ponds, landscape ponds, and recreational forests. In addition, our Onyang and Cheonan site has been working with public-private partnerships since 2007 to install sand collectors remove ecosystem disturbance and collect ocean waste at least biannually to preserve the ecology and landscape of the Sohwang Sand Dune<sup>1)</sup> in Joryeong, Chungcheongnam-do, South Korea. The entirety of the Dune is well preserved as a designated natural landscape and landscape conservation area and a coastal landscape reserve (Ministry of Environment, Ministry of Oceans and Fisheries), and is home to endangered wildlife such as the Mongolia racerunner (*Eremias argus*) and Swinhoe's egret (*Egretta eulophotes*).

<sup>1)</sup> Sohwang-ri Coastal Sand Dune, the only unspoiled coastal dune in Korea (2 km of coastline and an area of about 120,000 m<sup>2</sup>), home to 391 species of flora and fauna, including many endangered wildlife.

### Wildlife near Osan Stream Wastewater Outlet



Eurasian Otter



Leopard cat



Water deer

Positive contribution  
: CSR initiatives



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## 2024 Environmental Sustainability Report

Reporting on our 2023 fiscal year



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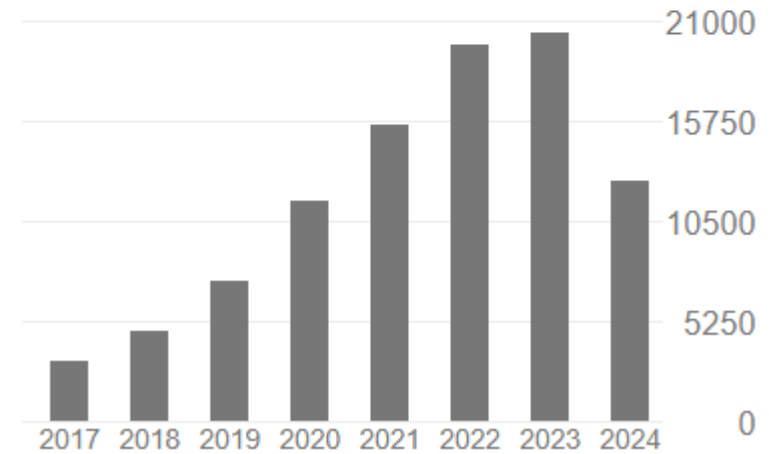
### 고려대 HCR 교수, 국제ESG협회 회장

- 미국 스탠퍼드대학교 William Mitch 교수와 **환태평양대학협회 프로그램 총괄책임자**로 활동, 전 세계 글로벌 기업, 연구 기관과 함께 ESG 분야 기술 및 정책개발 연구를 선도
- 2019년 11월 한국인 최초로 환경생태 분야 “세계에서 가장 영향력 있는 연구자(Highly Cited Researcher)” 선정, 국내에서 가장 많은 고인용 논문(HCP) 보유. 2022년에 **전 세계 최초로 환경생태, 공학 및 생물학/생화학 3대 분야에서 HCR**로 선정
- 2021년 3월부터 MIT, 스탠포드대, 뮌헨공대, ETH, 코넬대학교 등 세계 최고 석학들과 글로벌기업의 ESG 평가를 위한 글로벌렉처시리즈를 출범, 환태평양대학협회 **60개 대학 2백2십만 회원**을 대상으로 ESG 강의
- 국내 최초로 고려대학교 경영대학에 “**비즈니스와 환경**”을 주제로 **MBA, EMBA 강의를 개설**하였고, 고려대학교 경영전문대학원 ESG 최고경영자과정, E-MBA, Crimson 글로벌 리더 과정 등에서 환경 분야에 특화된 ESG 강의를 진행

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