# NOKIA

# Nokia – Biodiversity / Geodiversity Position Paper

Nokia public brief

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# 1  Executive summary

**This paper describes Nokia's position in biodiversity and geodiversity**

Sustainability is a key component of Nokia strategy and purpose. **We believe digitalization and connectivity solutions are critical to resolving many of the global problems facing society** today – environmental, social and economic.

We were the first telco vendor to have our Science Based Targets (SBTs) accepted in 2017 by the SBT initiative. Our current 1.5°C aligned target is to halve our emissions by 2030 and reach net zero by 2050. However, climate is not a standalone part of nature, and we are dependent on the natural resource base layer which includes biodiversity, geodiversity and air.

Bio/geo/air are interconnected and each of these areas need dedicated, specific actions.

**We have now started to track and quantify the impacts affecting natural capital (including bio- and geodiversity) across our value chain.** These areas of impact across our value chain include mining, raw materials, component production, final assembly production, logistics and fleet, installation and use of sold products, repair and maintenance, and product end-of-life activities.

**The ICT industry is not regarded as having a high impact on biodiversity.** However, the industry is heavily dependent on geodiversity, as production of hardware needs various metals, minerals, plastics, chemicals and water in a multi-tier supply chain.

Impact assessments are needed not only to understand the footprint consequences, but also **to realize the ICT sector's handprint opportunities which can help to restore, build and sustain healthy ecosystems. We believe the technology we provide enables environmental benefits for individuals, industries and communities that far outweigh negative impacts.**

# 2 Introduction

**At Nokia, we create technology that helps the world act together.** We have a two-pronged approach to sustainability. **Our biggest impact is our handprint, the positive impact of our technology on others**. We enable other industries and society to digitalize and capture the environmental and social benefits of the technology we provide. We aim to make asset intensive industries more efficient, creating less waste and encouraging greater reuse of precious resources and materials.

We also have a duty to ensure we **do everything we can to minimize our footprint**. From design to sourcing to manufacture and delivery and on to use and end of life of our products and solutions. We constantly strive for our products and solutions to be as energy and material efficient where practicable. We are diligent in knowing where and how our products and solutions are made, understand the source of the materials and drive to deliver and maintain them in the most sustainable way, ensuring they are responsibly taken care of at end-of-life.

While we continue our efforts to reduce our footprint, it is the digitalization and advanced connectivity facilitated by our products and services – our handprint – that can help to drive sustainability across all sectors. As we say at Nokia: "There is no green without digital." We see connectivity and digitalization as one key tool to fight against many issues related to climate change and nature loss.

# 3 Natural capital and natural resource base explained

**Natural capital is the world's stock of natural resources**, which includes minerals, soils, air, water and all living organisms. **Natural capital has financial value as the use of natural capital powers many businesses.**

**The natural resource base includes Land (SDG 15 Life on land), Water (SDG 14 Life below water and SDG 6 Clean water and sanitation) and Air (SDG 13 Climate action), all three of which are affected and impacted by outcomes of human behavior such as climate change, pollution and land use.** In the natural resource base, the three sectors are interconnected in a symbiotic way: biodiversity, geodiversity and air (including climate and air quality). All three categories are needed for a **stable environment to live and operate businesses.** A healthy natural resource base ensures companies, countries, nature and life are able to develop and grow sustainably.



**Air**
Meaning: Mixture of gases that surrounds earth. Air contains important substances, such as oxygen, nitrogen and carbon dioxide.
Enable: Stable environment to live and operate businesses. Essential for life to grow and survive.

**BIOdiversity**
Meaning: Variety of life on earth.
Enable: Food, medicines, clothes, building materials, fuels, carbon capture (natural defense against climate change) oxygen.

**GEOdiversity**
Meaning: Non-biological aspects of nature.
Enable: Basic raw materials such as metals, minerals and water

# 4     Biodiversity explained

Biodiversity comes from two words. '**Bio' meaning life and 'diversity' meaning variability.**

Biodiversity encompasses the biotic dimension of natural capital, and it consists of a complex concept addressing **three levels of diversity: genes, species, and ecosystems**

**Biodiversity is the variety of all living things; the different plants, animals and micro-organisms, the genetic information they contain and the ecosystems they form.**

**Genetic diversity** is the variety of genes within a species. **Species diversity** is the variety of species within a habitat or a region. **Ecosystem diversity** is the variety of ecosystems in a given place.

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# 5 Geodiversity explained

Geological diversity is a term which refers to the natural portion of the planet that is not alive, both at the surface and in the planet's interior. **By geodiversity, we mean the earth's minerals, rocks, fossils, soils, sediments, landforms, topography and hydrological features such as rivers and lakes.** The term geodiversity is extremely broad, but relatively new compared to biodiversity. **Geodiversity can be considered the stage upon which biodiversity acts and hence directly affects biodiversity.**

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# 6 Nokia's history and today

Nokia was founded in 1865 with more than 150 years of its heritage rooted in Finnish nature. Nokia started as a pulp and paper manufacturer and the transition to a primary focus on telecommunications began in the 1990s. Rapid success in the mobile phone sector allowed Nokia to become the best-selling mobile phone brand in the world by 1998.

The creation of Nokia Networks, following the buy-out of joint-venture partner Siemens in 2013, laid the foundation for Nokia's transformation into primarily a telecommunications network hardware and software provider. The 2015 acquisition of Franco-American telecommunications equipment provider Alcatel-Lucent greatly broadened the scope of Nokia's portfolio and customer base. Additional acquisitions have positioned Nokia to be a global technology leader in the telecommunications industry.

Our heritage comes from deep in the forest industry and even today **Nokia owns some 900 hectares of natural forests and lands in Finland, of which 15,4% are strictly protected** (including some sea areas). Areas in the north of Finland are unique and rich in biodiversity as there has been minimal human impact or presence in many of these areas.

Today Nokia is a producer of communications networks products including hardware, software and related services.

**The ICT industry is not seen as one of the highest impacting sectors on biodiversity**. The industry is however as stated earlier heavily dependent on geodiversity, as production of hardware needs various metals, minerals, plastics, chemicals and water in a multi-tier supply chain. In addition, the supply chain process also requires transportation, packaging and warehousing. During the life cycle of the products there are consequences to biodiversity, geodiversity and climate across the value chain. Carbon emissions and materials usage are already known and reported.

**We have now started to work to track and quantify the impacts affecting natural capital (including bio- and geodiversity) across the value chain. These areas include mining raw materials, component production, final assembly production, logistics and fleet, installation, use of sold products, repair and maintenance, and product end-of-life activities.**

**Impact assessments are needed not only to understand the footprint consequences, but also to realize the ICT sector's handprint opportunities which can help to use natural resources more efficiently and therefore to reduce the impacts on air/bio/geo.** We have described a number of handprint use cases in section 9

# 7 Our footprint and mitigation efforts: products, services, supply chain, operations

**As global warming, land use and mineral extraction affect the world's biological and geological diversity, Nokia has set clear targets to minimize our emissions and to increase circularity across our value chain.**

Climate change, geodiversity and biodiversity are all strongly interlinked. Climate change is one of the main drivers of biodiversity loss, while destruction of ecosystems undermines nature's ability to regulate greenhouse gas (GHG) emissions and protect against extreme weather, thus accelerating climate change and increasing vulnerability to it. Our Science-Based Target (SBT) is to reduce our greenhouse gas (GHG) emissions across our value chain (Scope 1, 2 and 3) by 50% between 2019 and 2030 and reach net zero by 2050. We also continue to take action to minimize our direct carbon footprint by accelerating our climate ambition by setting a new 100% renewable electricity target across our facilities, including offices, R&D labs and factories by 2025. In addition, we also emphasized that commitment by joining the RE100 initiative. Geodiversity has also strong links to climate. Around 50% of global emissions come from the global production of materials and less than 10% of materials are today treated as circular. **Increasing circular practices and reducing waste are therefore critical to combating climate change and bio/geodiversity loss.** We have introduced a waste circularity metric to guide our operational circularity journey and to close the material loop. In 2022, we introduced a new circularity metric to guide our operational circularity journey and to close the material loop. Our new target is to be 95% circular with regard to waste in 2030.

**We have committed to recognize, understand and measure our total environmental footprint which includes climate, biodiversity, and geodiversity impacts related to our business across our value chain.**

We are actively following the development of biodiversity and geodiversity policies and frameworks such as EU Biodiversity strategy and the SBT for Nature, as measurement and target setting are not yet as mature as for carbon emissions.

You can read more of our environmental work from our public People & Planet sustainability report

https://www.nokia.com/about-us/sustainability/

# 8 Our handprint: adoption of our products and services for a greener economy

**We believe that the technology we provide enables environmental benefits to individuals, industries and communities that far outweigh negative impacts**. These benefits are the handprint of digitalization and connectivity. The environmental handprint of digitalization is a result of access and availability of real-time data and measurement leading to industrial process efficiencies, and the acceleration in the uptake of renewables in smart energy grids. All this together leads to a more efficient society with minimized use of available natural resources.

Below you can find a few examples of digitalization handprint possibilities and use cases.

- Agriculture

The global food system is the primary driver of biodiversity loss, with agriculture alone being the identified threat to 86% of the species at risk of extinction (UNEP).The Intergovernmental Panel on Climate Change (IPCC) estimates that agriculture is directly responsible for up to 8.5% of all greenhouse gas (GHG) emissions, with a further 14.5% coming from land use change (mainly deforestation in the developing world to clear land for food production) as well as methane generated by livestock.

Case study: In conjunction with Nokia, the Vodafone Foundation has launched Smart Agriculture-as-a-Service to improve the livelihood of 50,000 farmers across 10 districts in the states of Madhya Pradesh and Maharashtra in India. More than 400 sensors have been deployed over 100,000 hectares of farmland to collect data for analysis by the solution's cloud-based and localized smart agriculture app. Sensors include soil probes, weather stations, insect traps and crop cameras. Insights from the data will help farmers to improve soy and cotton crop yields, as well as reduce their impact on the environment.

- Monitoring and early warning systems

While we strive to minimize the progression of climate change and biodiversity, we also recognize that the impacts of climate change and biodiversity loss are already here as well as other negative environmental impacts caused by the industrial age. This can be seen in the increased frequency and severity of natural disasters, such as wildfires and floods as well as unprecedented heatwaves and pollution. Scientists have confirmed that the sixth mass extinction is already happening.

The ability to better predict and react is an economic and social imperative. There is a need for effective large-scale, low-maintenance, real-time, outdoor environmental sensing and monitoring solutions for early detection, warning and prevention if we are

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to minimize the economic, social and environmental impact of these events. Nokia is working with domain experts, and partner organizations to validate use cases and run real world proof of concepts. These solutions use solar-powered universal multi-modal sensors with direct cloud connectivity to monitor outdoor environmental conditions, provide customizable cloud analytics and intuitive user interfaces**. A major use case is early detection of forest fires or floods to improve response times and reduce their social, financial, and environmental impact.**

Read more here: [Remote Environmental Monitoring - Nokia Bell Labs (bell-labs.com)](bell-labs.com)

- Engagement activities

Transparency, awareness and protection of natural ecosystems enabled by digital tools to help people to share and collaborate, creating networks of data for research, engagement and activism.

As an example of the power of digitalization, eBird - https://ebird.org is a mobile app and online community. Users share their bird sightings and explore hotspots worldwide. The data collected is used for research, conservational and educational purposes or iNaturalist https://www.inaturalist.org/ which uses the power of image recognition technology to identify the plants and animals around you.

- More articles about our work and digitalization possibilities:

https://www.bell-labs.com/institute/blog/flying-horticulturist-how-nokia-bell-labs-ai-and-drones-are-helping-aerofarms-revolutionize-vertical-farming/

https://www.nokia.com/networks/services/iot-for-smart-cities/

https://www.nokia.com/networks/industries/maritime/

https://www.dac.nokia.com/industry/public-safety/Digital communications power sustainable mining practices | Mining Digital

https://www.nokia.com/networks/insights/fight-to-feed-10-billion/

https://www.aerofarms.com/2021/08/05/aerofarms-and-nokia-unveil-partnership-for-next-generation-ai-enabled-plant-vision-technology/

https://www.dac.nokia.com/industry/smart-cities-agriculture/?_ga=2.25573373.1116068683.1664881725-1764602609.1642668660#agriculture