INDORAMA VENTURES

TNFD Report 2023

In accordance with

Taskforce on Nature-related Financial Disclosure Framework

Indispensable Chemistry

INDORAMA VENTURES'S WAY FORWARD

Mobilizing for Action

The decline in biodiversity and ecosystem functions threatens most of the UN Sustainable Development Goals (SDGs). The protection and restoration of biodiversity are critical. Our best approach is to move from nature-negative to nature-positive activities, with the final goal of halting and reversing biodiversity loss.

A Win – Win Approach

Indorama Ventures firmly believes that we can transform the biodiversity-related risk issue into an opportunity. Not only we will be making a positive impact globally, but we also see a stronger and sustaianble business as a result. Healthy biodiversity promotes stability and resilience in ecosystems, which are vital for a stable supply chain and operations. The push for more eco-friendly solutions drives innovation and opens new business opportunities. Our work enables a self-sustaining positive feedback loop, generating goodwill among beneficiary communities, suppliers, customers, consumers, and employees. This, in turn, strengthens and confirms the mission of Indorama Ventures' mission "To Be A World-Class Sustainable Chemical Company, Making Great Products for Society".

Fostering Collaboration

Success in addressing the biodiversity risks requires close collaboration between governments (e.g. policies and regulations), the private sector (e.g. investment), and end consumers (e.g. habits and behaviors). We have taken our first step to understand that the Group's business activities are connected to and rather integral parts of a larger ecosystem, which matters for long-term business sustainability. We strive to continue our research and take the lead in implementing good sustainable practices. We call on everyone to join us in acting responsibly.

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1. INTRODUCTION

The World Economic Forum's 2024 Global Risks Report warns of a significant escalation in environmental and technological risks over the next decade. Biodiversity loss and ecosystem collapse is expected to become increasingly severe, climbing from the 20th to the 3rd position in global risk rankings. This emphasizes the urgent need to address this issue, along with critical changes to Earth systems and resource shortages, which are also projected to worsen.

While the focus has traditionally been on addressing climate change, the report underscores the interconnectedness of biodiversity and climate. Neglecting biodiversity could undermine efforts to combat climate change, as they mutually influence each other. Indorama Ventures acknowledges its responsibility in conserving biodiversity and pledges to safeguard it in the locations where it operates.

The Taskforce on Nature-related Financial Disclosures (TNFD) is an initiative aimed at addressing the critical link between financial systems and the natural world. Like the Task Force on Climate-related Financial Disclosures (TCFD), TNFD seeks to enhance the transparency and accountability of businesses and financial institutions regarding their impact and dependency on nature. We will be using this framework to identify Indorama Venture's impact and dependencies on nature, and assess, manage, and mitigate our risks in relation to biodiversity.

About Indorama Ventures

Indorama Ventures is one of the world's leading petrochemicals producers with a presence in 35 countries, with 149 manufacturing facilities, 29,000+ employees, and a consolidated revenue of US$ 15.6 billion in 2023. It's headquartered in Bangkok, Thailand. It operates across a diverse range of industries including fibers, packaging, chemicals, and feedstocks. The company's core business revolves around the production of intermediate petrochemicals such as purified terephthalic acid (PTA), polyethylene terephthalate (PET), ethylene oxide (EO), ethylene glycol (EG), and various specialty chemicals. These products serve as crucial inputs for various industries, including textile and apparel, beverage packaging, automotive, home furnishings, and personal care.

Indorama Ventures is actively engaged in sustainable initiatives. The company is committed to responsible manufacturing practices, resource efficiency, and environmental stewardship. It actively promotes the circular economy by implementing recycling programs and developing sustainable solutions for packaging and other applications.

To support the UN Sustainable Development Goals (SDGs), Indorama Ventures is aware of the importance of biodiversity loss and the aim to minimize its impacts on the ecosystem. Addressing biodiversity loss risk is essential for achieving the SDGs holistically and Indorama Ventures is committed to making a positive impact.

2. GOVERNANCE

Indorama Ventures has a robust governance structure in place to address sustainability issues effectively. The company recognizes the importance of integrating sustainability into its overall business strategy, operations, and decision-making processes.

Figure- 1. Sustainability Governing Structure

The board of directors plays a crucial role in climate governance by ensuring that the climate change issue and our decarbonization strategies are integrated and aligned with the overall company business strategy. The board meets on a quarterly basis where climate-related issues are discussed.

Three sub-committees are appointed by the board: Sustainability and Risk Management Committee (SRMC), Nomination, Compensation, and Corporate Governance Committee (NCCG), and the Audit Committee. The SRMC approves and reviews the implementation of sustainability strategies, monitors physical and transitional risks, and reviews risk mitigation plans and scenario analyses.

Meeting quarterly, the SRMC is chaired by the Group CEO and includes the Deputy Group CEO and Chief of Financial Officer, Chief Strategy and Transformation Officer, Chairman of the ESG Council, two independent directors, executive president of three business segments (CPET, Fibers, and Indovinya).

The nine members of the SRMC work with all key functions of the organization including Advocacy, Risk Management, Strategy, Environment, Health & Safety (EHS), and Sustainability, reflecting the broad and multidisciplinary nature of sustainability. More information on the SRMC is available here.

While we have a strong risk management structure in place for climate-related risks, we are moving a boundary to nature-related risks. More information on our climate risk management can be found in our TCFD report here.

3. STRATEGY

The risks associated with climate change have a growing impact on both the ecosystem and their own commercial activities. Nature somehow poses a material risk to business in most industries across all geographies. All businesses rely on natural resources, either directly or indirectly. Therefore, we consider the consequences as a whole and pay more attention to the impacts and dependencies of nature.

ENCORE (Exploring Natural Capital Opportunities, Risks, and Exposure) is a tool developed by the United Nations Environment Programme (UNEP). This tool aids in comprehending how our actions and decisions can impact and shape natural capital. ENCORE offers insights into opportunities for sustainable development as well as the risks linked to the overexploitation or degradation of natural resources. Indorama Ventures has identified dependencies and impacts on natural capital that hold significance for our business.

Table 1. Impacts and Materiality Rating on our Business based on the ENCORE analysis.

Impacts – Impacts drivers	Materiality rating
Water use	**Very high**
Terrestrial ecosystem use	**High**
Water pollutants	**High**
Soil pollutants	**High**
Non-GHG air pollutants	**Medium**

Table 2. Dependencies and Materiality Rating on our Business based on the ENCORE analysis.

Dependencies – Ecosystem services	Materiality rating
Mass stabilization and erosion control	**Low**
Mediation of sensory impacts	**Low**
Surface water	**Low**
Ground water	**Low**

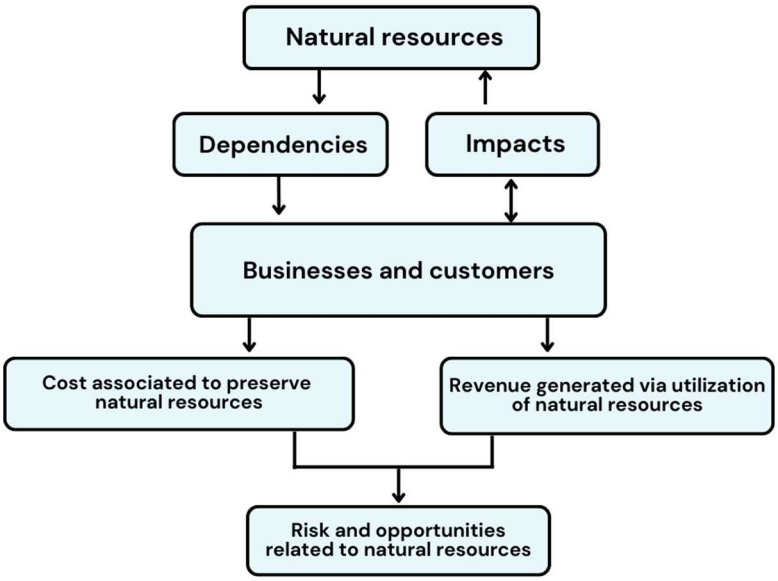

Figure- 2. Interlinkage of Dependencies and Impacts on Natural Resources and Business

3.1 Nature-related Risks and Opportunities

For Indorama Ventures, it is significant to consider the potential impact on the ecosystem and species, and thus, our dependencies and impacts are highlighted in Tables 1 and 2.

Although nature-related risks often overlap with non-financial and financial aspects and interdependencies. Below are the major risks and opportunities identified for Indorama Ventures at the group level.

Table 3. Nature-related Risks and Opportunities

Nature-related Risks		
Physical	• Increase severity of extreme weather events such as cyclones, droughts, and floods, and natural disasters will affect acute disturbance of operation, resulting in acute disturbance. • Increase in vulnerability of ecosystem will have effects on business activities. • Raw material cost, operational cost, and management cost.	
Transition	*Regulatory* • Expanding number of policy interventions • Requiring additional disclosure specifications • Risk of current and future legislation leading to restriction of operations at certain sites of operation or delays to specific projects. • Risk of forthcoming regulation leading to new standards • Clean up and compensation costs. • Biodiversity-related taxes, fees, and charges e.g., Taxation like Carbon Emission tax, Prohibition on resource extraction and utilization like water and land • Licensing to continue to operate.	*Operational* • Resource dependency, scarcity, and quality: reduced availability of natural resources and raw materials (from both renewable and non-renewable) • Operational and supply chain disruption • Potentially higher costs of doing business.

	Market • Loss of consumer demand and investor security. • Getting green investments and loans or having higher cost of capital. • Risk of production due to input price and its cost due to restrictions on sourcing and decline of global abundance of resources. • End of life of product would have the cost on collection and recycling. • Declining brand value.	*Reputational* • Increasing pressure from stakeholders • Reputation damage from environmental and social impacts • Social Unrest • Affecting to social license to operate.

Nature-related Opportunities	
Compliance and Transparency • Proactively aligning with evolving regulations • Demonstrating commitment to responsible practices • Integrating the identified biodiversity risks into multidisciplinary company-wide risk • Engaging in dialogue with regulatory authorities can provide opportunities to support policies and regulations development. • Potentially attracting government incentives or grants.	*Operational Excellence* • Implementing Biodiversity Risk Assessment • Implementing operational eco-efficiency measures e.g., modern technologies, circular value chain • Management processes • Enhancing emergency response capabilities business continuity management that can minimize operational disruptions and associated costs
Investment, Expansion and New Market • Developing innovative and sustainable products e.g., lower carbon footprint, circularity • Attracting investors • Biodiversity-linked Sustainable Finance	*Reputational* • Embracing innovative technologies and processes that promote sustainability and biodiversity. • Engaging and creating opportunities for dialogue with stakeholders

3.2 Biodiversity Risk Frameworks

We utilize two beneficial tools to comprehensively identify and analyze our biodiversity risk for Indorama Ventures.

Integrated Biodiversity Assessment Tools (IBAT)

A useful tool that provides a rapid screening assessment and helps in identifying impact areas of high biodiversity value.

The International Union for Conservation of Nature (IUCN), Birdlife International, the World Conservation Monitoring Centre, United Nations Environment Programme and Conservation International have joined alliance to create the Integrated Biodiversity Assessment Tool (IBAT).

To estimate the threat of extinction for a species based on current, past, and future threats, Species assessments are conducted following a structured approach, utilizing the strict IUCN Red List Categories and Criteria. IUCN usually evaluates each species' Red List category every five to ten years. This reevaluation will allow us to track the changes in the species' status over time. Species' populations may increase, decrease, or remain stable due to various factors such as habitat loss, climate change, conservation efforts. Thus, we need to emphasis our strategy based on these changes.

The mean score linked with the Species Threat Abatement and Restoration Metric (STAR) is also offered by IBAT, allowing us to estimate the relative opportunities for positive biodiversity action.

WWF Biodiversity Risk Filter

An online tool that enables industries and financial institutions to Inform, Explore, Assess, and Respond to biodiversity risks. Biodiversity Risk Filter uses spatial data, such as maps of important ecosystems and species distributions, to provide valuable insights into the potential impacts of developing and existing projects on biodiversity. Biodiversity Risk filter helps to define the potential risks on operational sites, supply chains, and investments which help to focus on our efforts and actions to address them. The tool calculates a scape risk for 33 different indicators, each indicator representing an aspect of biodiversity-related risk. For each of the indicators, a scape risk score is calculated based on assessment of the condition of that aspect of biodiversity at a specific location and the dependency and impact of the industry sector on that indicator.

3.2.1 Biodiversity Framework

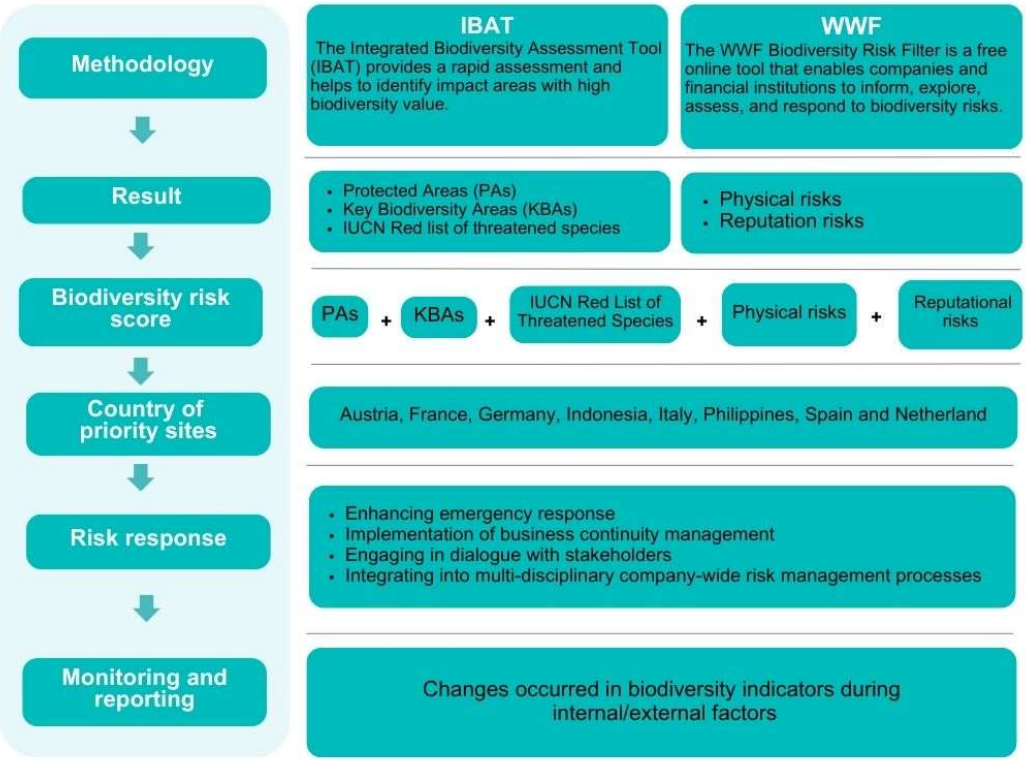

Figure- 3. Biodiversity Risk Assessment Processes

At both the corporate and business levels, IBAT and WWF biodiversity risk filter tools and techniques serve a valuable purpose in categorizing and prioritizing biodiversity risk. The evaluation of Protected Areas (PAs), Key Biodiversity Areas (KBAs) at operational sites and the IUCN Red List of Threatened Species helps in identifying priority sites and developing the biodiversity risk process.

Biodiversity risk emerges from the interlinked dependencies and impacts of businesses on local and global biodiversity. Primary research includes the diversity and intactness of ecosystems, the diversity and abundance of species and genes. Based on the existing requirements from reporting bodies, Indorama Ventures classifies risk types and risk categories into physical risk and transition risk, which are comprised of regulatory risk, reputational risk, and market risk in biodiversity risk assessment.

Based on the institutional questionnaires and rating expectations, Indorama Ventures underlines the importance of risk management while trying to depict the least impact on business and no impact on biodiversity and ecosystems.

Our IBAT analysis focused on various categories including Critically Endangered (CR), Endangered (EN), and Vulnerable (VU). Some of these species rely on geographic locations for breeding and survival. They hold a crucial place within the food chain, supporting both flora and fauna. Preservation of ecological niches becomes paramount for species habitats. Identifying these vital habitats is a significant priority for Indorama Ventures, as they contribute to the conservation of threatened species.

3.2.2 Reporting Methodology

TNFD framework is used to define methods and guidelines for risk assessment for biodiversity and ecosystem services, with risk assessment tools like IBAT and the WWF Biodiversity Risk Filter, which cover all 149 sites of Indorama Ventures (as of December 2023).

This TNFD report 2023 has been developed in accordance with the TNFD's risk management and disclosure framework, which aims to enable organizations to report and act on evolving nature-related risks. We incorporate the risk assessment results conducted via the IBAT tool and the WWF Biodiversity Risk Filter, which covers all 149 sites of Indorama Ventures. During the desktop research, the number of species identification was carried out based on the Red List of IUCN for each site. Identified species living in and around the project area or within protected areas or areas with high biodiversity and species within 30 km and 50 km of the site area, respectively.

Reference to methodologies used for assessment of Physical and Reputational risks. WWF biodiversity risk filter and IBAT tools for assessing the potential risks and effects on biodiversity associated with a company's operations as a location-specific approach.

1) Habitat Mapping

Habitat mapping provides valuable information about different species and their distribution. It reveals how different habitats are interconnected with each other, like routes and areas. For that, we utilized the existing tools to identify species which are threatened species like Critically Endangered (CR), Endangered (EN), and Vulnerable (VU) and are dependent on location for breeding and survival.

2) Identification of impact on affect species

Impact assessment is an ongoing process to assess the potential and negative consequences on ecosystem interaction. Consideration of species-specific sensitivities and external influence on species location, Changes in daily activity patterns, migration patterns are some evaluating factors to check the species population in and around the operation area.

3) Identification of Invasive species

Domination of alien or invasive species in the local area or project area may trigger the rate of extinction of local species through their best-fit survival competition. In a business context, where we have a supply chain extend to meet demand for raw materials, these invasive species might propagate into the site area. This would lead to disruptions in the food web and the order of the food chain in the Key Biodiversity Areas (KBAs) and hamper the operation.

4) Identification of species based on the IUCN classification for site

Through desktop research, number of species identification was conducted. Utilizing the IUCN Red List of Threatened Species within a 50 km radius, a diverse spectrum of species within and surrounding sites, including protected areas or zones contiguous to key biodiversity areas, were encompassed. Using the IBAT tool, we quantified species falling under the Critically Endangered (CR), Endangered (EN), and Vulnerable (VU) categories according to the IUCN Red List of Threatened Species, all within a 50 km radius of each site.

Number of IUCN Red list of threatened species (CR, EN, VU Category) within 50 km.	Numbers of sites
> 400	-
321 - 400	5
241 - 320	7
161 - 240	20
81 - 160	49
< 80	68

5) Distance criteria for Biodiversity Risk Assessment

Distance criteria play a crucial role in ensuring that the assessment captures both direct and indirect impacts on biodiversity. Utilizing the IBAT tool, the assessment encompasses risk-associated regions within a 50 km radius. Enterprises situated in key biodiversity areas are susceptible to biodiversity risks tied to shifts in land use and land cover.

Table 4. Biodiversity Risk Metrics for Indorama Ventures

Risks arising from Site Operations		Protected Areas & Key Biodiversity Areas		
		< 10 km (Numbers of Sites)	< 20 km (Numbers of Sites)	< 30 km (Numbers of Sites)
Low	The site impacts indicate that such impacts are significant with a negligible risk.	Not enough data	Not enough data	143 sites
Moderate	The nature of the site impact suggests that the impact is significant with moderate risk	Not enough data	Not enough data	2 sites
High	The nature of site impacts suggests that the impacts are significant with a high-level of risk.	Not enough data	Not enough data	2 sites
Very high	The nature of site impacts suggests that the impacts are significant with a high-level risk.	Not enough data	Not enough data	2 sites

This report also encompasses data in line with the Global Reporting Initiative (GRI) standard i.e., GRI 304: Biodiversity. For each operational site, the report provides the following biodiversity-related features, counts of Protected Areas (PAs) and Key Biodiversity Areas (KBAs) within the designated radius of the operational sites, as well as counts of IUCN Red List species potentially found within a 50 km radius.

The identification of priority sites in eight countries with potential biodiversity risk impact at Indorama Ventures is informed by IUCN data (KBAs, PAs) and the WWF Risk Filter (Physical Risk score). Based on these assessments, locations are categorized and prioritized according to their scores, leading to the designation of priority sites.

Table 5. Countries with priority sites that have potential biodiversity risk impacts for Indorama Ventures

America	Europe (6 countries)	Asia (2 countries)
-	Austria Germany Italy Spain France Netherland	Indonesia Philippines

4. RISK & IMPACT MANAGEMENT

Indorama Ventures implements several tools to identify and evaluate potential nature-related impacts and dependencies associated with its operations. While climate related tools can be found in our TCFD report, specific biodiversity related tools include IBAT and WWF Biodiversity Risk Filter. IBAT incorporates the IUCN Red List, information on Protected Areas (PAs), and Key Biodiversity Areas (KBAs) to assess the potential impact on biodiversity and prioritize conservation efforts. Additionally, WWF Biodiversity Risk Filter is used to evaluate physical risks related to ecosystem services, helping to identify potential vulnerabilities and develop strategy, action plan and mitigation measure.

From the outcomes of the assessment, we also analyze nature-related risks in terms of their financial impact, particularly if sites with the highest risk score (as mentioned above in Table 5 above) encounter the severe situation that finally results to plant shutdown and business failure. We did not experience the biodiversity risk The estimated impact against 2023 production and EBITDA are summarized in Table 10.

In 2023, the effects of biodiversity issues were nonexistent. However, we continued to monitor and analyze its effects while estimating the expenditures that would be incurred if the shutdowns were to occur based on the production loss, and EBITDA loss figures from 2023 data. More details are in Table 6.

Table 6. Estimate EBITDA Loss of priority sites that have potential biodiversity risk impacts

	Production Loss (Million tons)	**EBITDA Loss** (Million USD)	**Estimate EBITDA Loss from Shutdown** (Million USD)		
			30 days	**60 days**	**90 days**
High priority sites in eight countries	1.68 *(10.48% of total production)*	46.71	3.89	7.79	11.67

Note: In 2023, total actual production was 16.03 million tons and total EBITDA was 1,284 million USD.

4.1 Action Plan of Indorama Ventures

Based on our research and assessment, we have identified the following short, medium, and long-term actions for Indorama Ventures in the context of biodiversity risk management.

We are in the process of integrating biodiversity-related risk, which is a new initiative, into our company strategy to develop the action plans and response strategies. We have initiated this process with climate indicators, aligning with our decarbonization strategies and will subsequently extend our focus to other indicators that will support the company's vision and strategy.

Table 7. Nature Risk Management Roadmap

Goals	Short-Term (0 - 5 years)	Mid-term (6 - 10 years)	Long-Term (11 - 30 years)
Biodiversity operations in priority areas	• Educate our employees about biodiversity • Set a strategy with our risk team • Develop Biodiversity Risk Mitigation Action Plan (BRMAP) for priority sites • Reassessment every two years	• Conduct biodiversity assessment covering more metrics • Develop Biodiversity Risk Mitigation Action Plan (BRMAP) for all Indorama Ventures sites • Set biodiversity targets • Develop a global policy to support biodiversity and deforestation regulations	• Monitor progress and data reporting to see if we are on track for our targets • Identify and take mitigation action for impacts and dependencies of our suppliers and our products
To enhance assessment of biodiversity risks in priority areas to existing operations and new coming projects.			

We completed the initial biodiversity risk assessment for Indorama Ventures in June 2023, focusing on our own operations in the first phase. We evaluated the impact and dependencies of all our sites on biodiversity and ecosystem services. This encompassed considering IUCN red list species within approximately a 50 km radius of site locations, as well as Protected Areas (PAs), and Key Biodiversity Areas (KBAs) around a 30 km radius of site locations, and risks relating to ecosystem services. From these assessments, we have found the priority eight countries for the initial phase of our Biodiversity Action Plan (BAP). These sites are situated in Austria, France, Germany, Italy, Indonesia, Philippines, Spain and Netherland.

5. METRICS & TARGETS

For the years 2025, Indorama Ventures has established several sustainability goals to guide our company's operations and address the opportunities, risks, and dependencies associated with nature and biodiversity.

The protection and restoration of biodiversity assume paramount importance as we are to collectively achieve our sustainability goals. We are committed to protecting nature and natural resources by actively supporting green projects that contribute to decarbonization which leads to the mitigation of climate change and biodiversity conservation. As we initiated emphasis on identifying our risk from Climate Change, pollution load in water, air, and environmental degradation within our reporting boundaries. Our Target are in align with upcoming mitigation strategy and action plan.

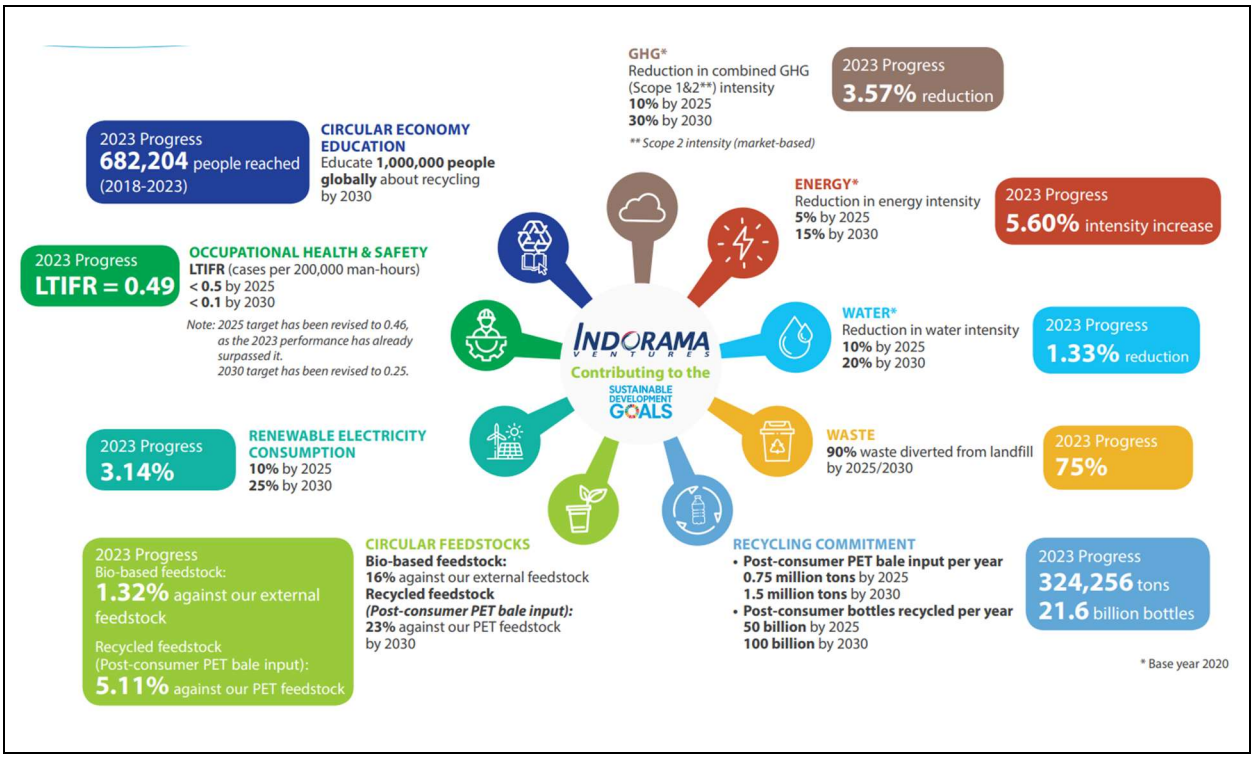

Figure- 4. Indorama Ventures' Commitment to Sustainability Targets and performance

5.1 Conservation of Biodiversity and the Ecosystem

At Indorama Ventures, we place an emphasis on biodiversity conservation, as reflected in our Biodiversity Statement. We will ensure that we do not conduct operations in nationally significant areas or habitats, such as World Heritage Sites or International Union for Conservation of Nature (IUCN) protected areas. We are integrating biodiversity into our strategy and decision-making processes. We actively adopt preventive, minimization, and improvement measures to protect all species and habitats, including those at risk and of high biodiversity value. We are prioritizing our knowledge among stakeholders to promote research related projects for biodiversity conservation and initiate steps to enhance and restore ecosystems. Our approach also involves adherence to sustainable practices, and the implementation of the mitigation strategy, and engagement of local communities. Furthermore, we align our efforts with the UN SDGs, especially SDG 14 - Life Below Water and SDG 15 - Life on Land.

Indorama Ventures commits to protecting threatened species and damaged habitats, including those under threat and of high biodiversity value, through preventive, minimization, and improvement measures. Indorama Ventures extends its commitment to biodiversity conservation by urging suppliers to follow our Biodiversity Statement.

Our Biodiversity pathway includes:

- Environmental protection initiatives to improve water quality, conserve soil, and preserve native areas and wildlife.
- Forest preservation activities in collaboration with local communities.
- Development of small producers working with nature-based raw materials through agro-forestry, local vegetation, and restoration in our Indovinya business without negatively impacting their operations (e.g., palm oil and sugar cane).

Through these actions, Indorama Ventures demonstrates our dedication to responsible business practices and the preservation of biodiversity in ecologically important areas and habitats.

In our efforts towards biodiversity management, we utilize the WWF Risk Filter tool to conduct a thorough risk assessment. By doing so, we will be able to identify and prioritize biodiversity conservation strategies for high-impact sites over the next five years.

Drivers of Nature change (In accordance with the SBTN Methodology)

To ensure that biodiversity loss is prevented within Indorama Ventures, it's crucial to implement strategies that address the following key factors, which are the 5 drivers of nature change.

1. **Land-use change**: This involves preserving and restoring natural habitats, adopting sustainable land management practices, and trying to reduce the conversion of natural ecosystems for industrial use. Additionally, we commit to no deforestation for our current operations and any future expansions or new projects.
   Case studies:
   - In 2023, as part of our commitment to environmental stewardship and community engagement, 200 dedicated employees of Indorama Ventures participated in a reforestation and community forest project located in Rayong, Thailand. The program's objective is to restore biodiversity by planting various perennial trees, including Hopea odorata, Pterocarpus macrocarpus, and Dipterocarpus species, while also enhancing the ecosystem with the release of more than 12,000 freshwater fish, including Oreochromis niloticus, cyprinidae and catfish, into a designated pond.
     Over the next six months, our local team will continuously monitor the growth and survival rates of the planted trees to ensure the project's long-term success. This initiative exemplifies our dedication to sustainable practices and community empowerment, with full support from the local Thai government, enabling the community to manage and utilize forest areas sustainably, thereby maximizing the benefits to their livelihoods.
2. **Climate change**: Indorama Ventures can prevent biodiversity damage by reducing greenhouse gas emissions, enhancing energy efficiency, shifting towards renewable energy sources, and adopting climate-resilient business practices. Continuously seeking opportunities to substitute fossil fuels with renewable energy throughout our operations is a priority.
   Case studies:
   - We have installed onsite solar units across 16 sites in China, Egypt, India, Indonesia, Italy, Lithuania, Thailand and USA.
   - Indorama Ventures Oxides Ankleshwar Pvt Ltd (IVOAPL)'s Utility team and Engineering team have implemented various energy savings initiatives on site which have provided benefits for reduction in GHG of 585 tCO_2e/year, energy reduction of 2,345 GJ/year and energy saving of 563,389 kwh/year.

3. **Natural resource use and exploitation**: This can be addressed by implementing sustainable resource management practices, adopting circular economy principles to reduce waste and promote resource efficiency, and ensuring responsible sourcing of raw materials.

   Case studies:

   - In 2023, The Indorama Ventures Fibers team in Kaiping celebrated the successful commissioning of a new wastewater treatment system, the Ultrafiltration Membrane System. This system reduces water consumption at the Green Hill site by approximately 100 tons per day, accounting for 30% of the total usage. The achievement of zero wastewater discharge for both the Changsha and Green Hill sites signifies a major milestone in our sustainability and cost improvement journey.
   - Between February 2011 and September 2023, Indorama Ventures reached the milestone of recycling 100 billion PET bottles. This achievement diverted 2.1 million tons of PET waste from the environment and reduced the carbon footprint by 2.9 million tons.

4. **Pollution**: Measures to mitigate pollution include implementing pollution prevention technologies, improving waste management practices, reducing chemical usage, and implementing wastewater and air quality monitoring programs.

   Case studies:

   - Automation to Reduce Effluent Waste: Indorama Synthetics (India) has successfully implemented an automatic chemical dosing system for two of their cooling towers. The automated system ensures that the desired level of chemicals is consistently maintained in the system, preventing both corrosion and scaling caused by underfeeding, in addition to chemical waste due to overfeeding.
   - Five sites have achieved Zero Liquid Discharge, ensuring that 100% of water returned to the source of extraction are at similar or higher quality as raw water extracted. These sites include Avgol Nonwovens India Private Limited, Indorama Petrochem Limited (PET), PT. Indorama Ventures Indonesia (PET), PT. Indorama Ventures Indonesia (Fibers), and Schoeller Kresice s.r.o.

5. **Invasive species and diseases**: Indorama Ventures can implement measures to prevent the introduction and spread of invasive species and diseases, such as implementing biosecurity measures, conducting risk assessments for new projects, and collaborating with stakeholders to monitor and control invasive species and diseases.

   Case studies:

   - Renova Mamona: A project led by Indovinya and taking place around the Camaçari site in Brazil, aims to enhance the biodiversity of the local quilombola community

through the implementation of Agroforestry Systems combined with castor bean cultivation. In the year 2023, the project achieved the following milestones:

- Plantation of 2,000 square meters with diversified species
- A 60% increase in plant species variability and establishment of 4 seed banks
- Introduction of 32 new species.
- Production of a total of 300 liters of natural biofertilizers and 100 liters of natural pesticides through reservoirs.

It's worth noting that castor bean, the main input of the project and a raw material for Indovinya, is utilized as the primary species for green manure in the Agroforestry System (SAF). Additionally, its production does not involve the use of any type of manure, pesticides, herbicides, electricity, or fuels.

5.2 Water reduction and stewardship

Indorama Ventures is committed to water reduction and stewardship as part of its broader environmental sustainability efforts. Indorama Ventures implements a range of initiatives to minimize water usage, promote responsible water management across its operations, and actively contribute to the conservation and responsible management of water resources. These include implementing efficient water management practices, adopting water-saving technologies, conducting regular audits to identify areas for improvement, promoting water recycling and reuse, promptly addressing water leaks, engaging stakeholders to raise awareness about sustainable water practices, and ensuring compliance with water regulations. By 2025, we committed to

- Water intensity reduction 10% by 2025

*Base year 2020

In our sustainability efforts, we've completed 27 projects that saved water and reduced costs, supported by $63,000 in investments. Five sites, including Avgol Nonwovens India Private Limited, Indorama Petrochem Limited (PET), PT. Indorama Ventures Indonesia (PET), PT. Indorama Ventures Indonesia (Fibers), and Schoeller Kresice s.r.o., have achieved Zero Liquid Discharge status, ensuring responsible water management and efficiency across operations.

5.3 Waste reduction

We manage our waste responsibly, strive to exceed regulatory requirements. We also ensure that our waste and hazardous waste are disposal through authorized vendors who reuse, recover, or recycle waste in an environmentally and sustainable sound manner.

- We committed to manage our own waste at our own sites with proper due diligence of waste, especially hazardous waste, by following the guidelines on regulatory bodies from respective government time to time.
- We committed to divert 90% of waste from our site to landfills by 2025.

*Base year 2020

Our total waste intensity is 0.0289 tons per ton of production. A significant portion of our waste management strategy involves recycling and reusing 53% of our total waste, while 22% is sent for incineration with energy recovery. These efforts reflect our commitment to sustainable practices and minimizing environmental impact throughout our operations.

The achievement of the Zero Waste to Landfill (ZWL) certificate by Indorama Polyester Industries Public Company Limited in Rayong, Thailand exemplifies a waste project that contributes to biodiversity preservation. By implementing sustainable practices and responsible waste management, these companies have proven their commitment to conserving resources and minimizing environmental impacts. The ZWL certification recognizes their achievement of over 99% diversion rate management, meaning that almost all waste generated is being reused or recycled rather than ending up in landfills. By reducing waste and promoting resource efficiency, such initiatives help to protect water quality, preserve aquatic habitats, and support ecosystem functioning, ultimately benefiting biodiversity.

5.4 Sustainable sourcing

Our suppliers are required to adhere to all relevant environmental laws, regulations, and standards. Our Supplier Code of Conduct has been upgraded to a Responsible Sourcing Policy, encompassing guidelines concerning the procurement of palm oil, palm kernel oil, and derivatives. The policy includes legal compliance, ethical considerations, and human rights issues, including child and forced labor, health and safety, anti-bribery and corruption, mutual trust and respect, and environmental performance monitoring, among other key metrics.

Suppliers are expected to actively work towards minimizing the environmental impacts of their activities and products, including greenhouse gas emissions and energy consumption, and to ensure that their development efforts do not compromise local biodiversity and ecosystems.

We are in the process of planning engagements and educational initiatives to inform stakeholders about biodiversity and its relevance to our company. These efforts will involve press releases, training programs, and workshops.

We committed to

- Bio-based feedstock: 16% against our external feedstock
- Recycled feedstock (Post-consumer PET bale input): 23% against our PET feedstock by 2030

In 2023, our performance showed encouraging progress: we utilized bio-based feedstock, achieving 1.32% against our external feedstock, and incorporated recycled feedstock (specifically post-consumer PET bale input), reaching 5.11% against our PET feedstock.

We sourced and consumed more than 200,000 tons of bio-based raw materials. The top three highest volumes of sourcing were 150,302 tons of palm kernel oil and PKO fatty alcohols, 9,175 tons of Bio-MEG, and 6,289 tons of cellulose, respectively.

5.5 Emission reduction

We committed to

- GHG management: GHG (Scope 1 & 2) Intensity Reduction 10% by 2025
- Energy Intensity 5% by 2025
- Renewable Electricity consumption 10% by 2025
- 90% of waste diverted from landfill by 2025

*Base year 2020

Our green projects are helping the company to achieve its operational efficiency targets, increase its use of renewable energy (especially renewable electricity - both onsite generation and offsite procurement through power purchase agreements), implement new decarbonization technologies including carbon capture, introduce bio-feedstock to its petrochemical value chain, and expand its PET recycling capability.

Emission reduction has significant positive effects on biodiversity. By mitigating climate change, preserving habitats, improving water quality, and conserving ecosystem services, emission reduction directly and indirectly supports diverse species and ecosystems. It helps slow down the rate of climate change, minimize habitat destruction, and reduce pollution-related harm to plants and animals in the area. By addressing the root causes of emissions and promoting sustainable practices, emission reduction plays a crucial role in safeguarding biodiversity and ensuring the long-term well-being of our planet's ecosystems.

In 2023, our efforts in GHG reduction were substantial: we achieved a reduction of 138,750 tCO_2e through renewable energy consumption, including renewable electricity and biomass (Location-based). Our GHG emissions across Scopes 1, 2, and 3 (in 9 categories) were verified by an external auditor. We completed 11 GHG emissions reduction projects during the year, with 6 projects ongoing as of year-end 2023. These initiatives were supported by CAPEX investment of $13.1 million. Our GHG accounting, verification, and assurance processes were conducted in accordance with ISO 14064-1 and ISO 14064-3 standards, ensuring transparency and reliability in our environmental reporting and management practices.

5.6 Reporting

We conduct biodiversity risk assessment in every two years and regularly report on our progress and performance that made against our targets in sustainability report. In line with Task force Nature-related Financial Disclosure (TNFD) framework our commitments to aligned with Biodiversity and reforestation. We will further develop targets in line with our biodiversity strategy and action plan and disclose biodiversity related performance according to TNFD framework that was published in September 2023.

6. CONCLUSION

Indorama Ventures demonstrates an unwavering commitment to understanding and mitigating the consequences of its business activities on ecosystems and nature at large. The company places significant emphasis on measuring and transparently reporting its environmental impact, proactively managing risks, and continually enhancing its sustainability performance. Moving forward, Indorama Ventures pledges that any future production sites will adhere to the mitigation hierarchy and remediate any significant impacts on biodiversity loss within our ecosystem. For more information on our biodiversity-related commitments, please refer to our Biodiversity Statement.

Following the recommended disclosures from the TNFD, Indorama Ventures has assessed nature impacts, dependencies, risks, and opportunities. Information was collected using the ENCORE tool, IBAT, and the WWF Biodiversity Risk Filter.

The impacts and materiality ratings on our business are as follows:

- Water Use (Very high)
- Terrestrial Ecosystem Use (High)
- Water Pollutants (High)
- Soil Pollutants (High)
- Non-GHG Air Pollutants (Medium)

The dependencies and materiality ratings on our business are as follows:

- Mass Stabilization and Erosion Control (Low)
- Mediation of sensory impacts (Low)
- Surface water (Low)
- Groundwater (Low)

The results from IBAT and WWF Biodiversity Risk Filter indicate that we have covered all our sites. This indicates that there are eight priority countries with potential biodiversity risk impact on Indorama Ventures, and we will utilize this information for developing our action plan in the next phase.

Achieving success in nature conservation necessitates collaborative efforts from governments, the private sector, and end consumers. Governments play a critical role in implementing policies and regulations that support nature preservation. The private sector, including companies like Indorama Ventures, can contribute through investments in sustainable practices and technologies. Similarly, end consumers can drive positive change through conscious consumption habits and behaviors. Indorama Ventures acknowledges the long-term implications of present decisions and actively strives to comprehend the interconnectedness of its business activities with biodiversity and the broader ecosystem. Through ongoing research, implementation of best practices, and assuming a leadership role, Indorama Ventures endeavors to effect positive change and inspire others to embrace responsible action.

In conclusion, Indorama Ventures is resolutely committed to taking responsible action and mitigating the impact of its operations on ecosystems and nature. By embedding sustainability considerations into its business practices, Indorama Ventures aims to significantly contribute to the preservation of biodiversity and foster a harmonious relationship between business and nature.

Appendix 1 - Abbreviation

List of abbreviation is used:

1) BAP - Biodiversity Action Plan
2) BRMAP - Biodiversity Risk Mitigation Action Plan
3) ENCORE - Exploring Natural Capital Opportunities, Risks and Exposure
4) KBA – Key Biodiversity Area
5) GHG – Green House Gases
6) IBAT – Integrated Biodiversity Assessment Tool
7) PA – Protected Area
8) PET – Polyethylene Terephthalate
9) TNFD - Task Force on Nature-Related Financial Disclosures
10) TCFD - Task Force on Climate-Related Financial Disclosures
11) SDGs – Sustainable Development Goals
12) WEEC - Wetlands Edge Environmental Center
13) WWF - World Wildlife Fund
14) ZWL - Zero Waste to Landfill