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Climate Adaptation in Georgia: Empower the Protection of Ecosystems and Biodiversity

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DEFINITION OF TERMS:

IPBES - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

IPCC - Intergovernmental Panel on Climate Change

IUCN - International Union for Conservation of Nature

NBS - Nature-based solution

NDC - Nationally Determined Contribution

REDD+ - a process regulated by the United Nations Framework Convention on Climate Change (UNFCCC) that helps countries reduce emissions from deforestation and forest degradation.

Paris Agreement—The Paris Agreement is an international treaty on climate change adopted by representatives of 196 countries in 2015 in Paris, France, at the 21st Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC). The agreement involves joint efforts on climate change mitigation, adaptation, and financial management.

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INTRODUCTION

Climate change and biodiversity loss are two of the most pressing environmental challenges facing our planet. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC) indicate that these crises are closely linked. Climate change exacerbates biodiversity loss and ecosystem degradation, which in turn deprives nature of its ability to regulate the climate naturally.

Climate change is mainly caused by human activities, including the burning of fossil fuels, deforestation, unsustainable agriculture, and others. Collectively, these actions lead to rising global temperatures and extreme weather events that put enormous pressure on ecosystems and the species living within them.

At the same time, biodiversity loss is accelerated due to habitat destruction, pollution, overexploitation, and invasive species. Systemic degradation of biodiversity weakens ecosystems, making them less resilient to the impacts of climate change. As ecosystems degrade, their ability to sequester carbon decreases, further exacerbating climate change. This synergistic relationship between climate change and biodiversity loss poses a major challenge: while mitigating climate change, we must not lose sight of biodiversity and equally work hard on its vitality to ensure healthy and functioning ecosystems.

In our view, tackling these crises requires an integrated approach that recognizes the close links between climate change and biodiversity. Thus, effective coping strategies must include conservation of biodiversity, sustainable land use, natural habitat protection/restoration, and integration of nature-based solutions (NBS) into policies. Moreover, there is an urgent need for policies that promote renewable energy, reduce greenhouse gas emissions and encourage sustainable agricultural practices.

It is the NBS that can ensure increased sustainability of ecosystems, making them more resilient to the impacts of climate change. By restoring and protecting natural habitats, the ability of ecosystems to absorb carbon, regulation of water cycles, and protection of vital habitats for a wide range of species can be improved. These actions, collectively, contribute to both climate stabilization and the protection of biodiversity.

Public awareness and participation are extremely important in this cycle. Educating the public about the importance of biodiversity and the impact of climate change will help foster a sense of collective responsibility and encourage joint action to benefit their communities and the environment.

Through a comprehensive, multi-faceted approach, it is possible to break the destructive cycle of climate change and biodiversity loss, ensuring a planet that is climate resilient and rich in biodiversity.

THE ROLE OF NATURE-BASED SOLUTIONS IN CLIMATE CHANGE MITIGATION AND ADAPTATION

In their joint report, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC) highlight: "Biodiversity loss and climate change are driven by human economic activities, which reinforce each other" (IPBES-IPCC, 2020). Addressing these interconnected challenges requires innovative approaches that simultaneously combat climate change and promote biodiversity conservation. One prospective approach to crisis management is the introduction of nature-based solutions (NBS). The International Union for Conservation of Nature (IUCN, 2023) defines nature-based solutions as "actions that protect, sustainably manage and restore natural or modified ecosystems, effectively and adaptively address social challenges collectively benefiting human well-being and biodiversity" (Cohen-Shacham *et al.,* 2016). In other words, NBS implies working with nature to solve problems such as climate change, while using the natural resilience of ecosystems and biodiversity to solve social problems. Provides sustainable and cost-effective alternatives to infrastructure or technology approaches. Examples of nature-based solutions include ecosystem restoration, green infrastructure, sustainable land management, and adoption of biodiversity-friendly agricultural practices.

The potential of NBS in climate change mitigation and adaptation is extremely important. Ecosystems restored or protected through nature-based solutions, such as forests, peatlands and grasslands, contribute to the accumulation and storage of large amounts of atmospheric carbon dioxide (Seddon et al., 2020; Girardin et al., 2021). At the same time, healthy ecosystems mitigate the impacts of climate change by providing important ecosystem services such as flood control, drought resilience and coastal protection (Chausson et al., 2020; Seddon *et al.,* 2020; UNEP, 2022).

THE IMPORTANCE OF UNIFIED BIODIVERSITY MONITORING SYSTEMS

There is no unified strategy for research and monitoring of biodiversity in Georgia. Up-to-date information and research materials on Georgia's biodiversity are obtained from research conducted by universities and various civil society organizations. However, these studies have been conducted using different research methods, funded by various donors with different objectives. Therefore, we do not have a unified picture or a clear understanding of the scale of the threats or the status of individual species in the country. It is necessary to create a unified system for monitoring biodiversity and ensure government funding. Continuous dependence on donor funds is unreliable and it is impossible to think about long-term

stability. Government funding ensures continuity of monitoring and therefore the collection of more useful/accurate information.

The creation of unified monitoring systems by the state will become an indicator of the national priority of biodiversity and proper resource management. Integrating monitoring plans into the climate strategy, with a pre-defined focus on the specific needs of species conservation and policy objectives, will enable the government to allocate resources in a targeted and effective manner. In addition, government investment in biodiversity monitoring will foster the development of local expertise and capacity within the country. By funding research institutes, educational programs, and the scientific community, the government can both strengthen existing research institutions and train and specialize new practitioners, create new jobs and enhance the knowledge of local scientists and practitioners. The availability of data obtained from long-term monitoring by research institutes, training programs, and scientific community scientists and field researchers will facilitate informed decision-making and integration into national policy frameworks and decision-making processes.

INTEGRATING BIODIVERSITY RESEARCH INTO NBS IMPLEMENTATION

Integrating biodiversity research in the implementation of nature-based solutions (NBS) is important for several reasons. For example, mammals play a major role in ecosystem dynamics and are involved in seed dispersal, predator-prey interactions, habitat health, and the cycle of nutrient distribution (Miguel Martínez-Ramos et al., 2015; Villar, 2023). Studying certain species of mammals will help us monitor various ecological processes occurring within ecosystems, which are important and noteworthy when introducing Nature-Based Solutions (NBS). Without such data, there is a risk of undesirable outcomes or inefficiency during the planning, implementation, and management stages of NBS.

Monitoring species populations before, during, and after the implementation of NBS ensures measurable success. If the population's condition improves after the NBS intervention, this means that the solutions are effective. Conversely, a lack of or declining improvements may indicate a need to adjust the NBS approach. Individual data from different species help predict how entire ecosystems respond to NBS interventions.

An effectively planned and implemented biodiversity monitoring system is a clear indicator of how biodiversity is responding to NBS interventions. By tracking changes in species abundance, diversity, and distribution, researchers will be able to evaluate the effectiveness of NBS in restoring habitats and promoting ecosystem health. Lack of data hinders the study of the impact of NBS on biodiversity conservation goals. By continuously monitoring a population or ecosystem, it will be possible to modify NBS interventions in real-time, optimize outcomes, and eliminate previously unidentified problems. Lack of data makes adaptive management methods impractical, leaving the NBS vulnerable to unpredicted environmental

consequences. Lack of data on biodiversity can lead to a number of difficulties in implementing NBS: Without climate change adaptation data, misdirected efforts could unintentionally harm the environment. NBS interventions might be implemented in areas with limited ecological impact or even harm species. For instance, regulating predator populations or removing them from the wild without proper preliminary studies can disrupt the predator-prey interaction balance, leading to overgrazing and ultimately damaging the ecosystem.

Detailed data on species distribution, number, and habitat needs allow targeted NBS implementation. This ensures that effective protective measures are implemented for those species or habitats that are particularly vulnerable to climate change. Knowing that the Kvernak ridge is a vital nesting area for a specific bird species, such as the Egyptian vulture, a nature-based solution will, in this case, be directed at restoring and preserving the ridge. Implementing such infrastructural projects will be useful for the creation of public wealth and will not interfere with the population of Egyptian vultures.

Georgia can share the example of the UK, which implies including long-term plans for monitoring biodiversity in climate change strategies. In 2017, the UK government adopted a 25-year environment plan to reduce the impacts of climate change, which includes the government's commitment to create a nature restoration network by 2042 that will connect areas rich in wildlife, and the monitoring of species will be conducted as part of a single system. (HM Government, 2022). The UK Climate Risk Strategy notes that reliable long-term monitoring data will support ecosystem restoration and the development of nature-based solutions that increase the resilience of habitats and species to climate change, observe risks, hazards, and the impact of climate change on emerging or mitigating hazards, effectively develop or adapt climate policy documents and at the same time increase public awareness about climate risks. A similar adapted scheme could be implemented in the Georgian protected area system, which would have the same importance and the results would serve the same purpose as presented in the UK case.

NBS IMPLEMENTATION PRINCIPLES

The effectiveness of nature-based solutions depends on how these decisions are made and then implemented in reality. To achieve successful and sustainable NBS, the Nature-Based Solutions Initiative has developed four key guiding principles (Seddon, 2021):

Nature-based solutions are not a quick way out of fossil fuels; therefore, these solutions should not slow down the decarbonization of our economy;

Nature-based solutions include the protection, restoration and sustainable management of not only forests, but also a wide range of terrestrial and marine ecosystems;

Nature-based solutions must be developed, implemented and monitored with the full participation and consent of local communities;

Nature-based solutions should support or enhance biodiversity rather than weaken it.

STRENGTHENING GEORGIA'S CLIMATE STRATEGY WITH NBS PRINCIPLES

The importance of integrating biodiversity and ecosystems into climate strategies is highlighted in countries' Nationally Determined Contributions (NDCs) updated within the framework of the Paris Agreement. Georgia's 2030 Climate Change Strategy recognizes the critical role of forests, protected areas and sustainable land use in achieving climate goals (Government of Georgia, 2021).

Georgia's Climate Change Strategy 2030 (Government of Georgia, 2021) also recognizes the importance of ecosystems and biodiversity in achieving climate goals. The strategy underlines the role of forests, protected areas and sustainable land management in reducing greenhouse gas emissions and improving sustainability. However, unlike other countries' NDCs (for example, Chile's updated NDC includes specific commitments to protect and restore natural forests, wetlands and other ecosystems as part of climate change mitigation and adaptation efforts (Government of Chile, 2020), Georgia's strategy does not contain specific, quantitative goals and detailed action plans for protecting and restoring ecosystems as part of climate change mitigation and adaptation efforts.

When analysing Georgia's NDC, the strategy does not take into account the need to involve local communities and local populations in the development and implementation of the NBSs and does not emphasize the importance of enhancing biodiversity as a key goal of the NBS.

In a recent systematic review according to Key et al. (2021), it was made clear that 88% of nature-based solutions produced positive results in terms of climate change adaptation. Additionally, measurable results concerning ecosystem health also increased, with an average increase in the number of species by 67%. This underlines the fact that well-designed NBS is an important opportunity to conserve biodiversity and improve climate resilience. However, it should be noted again that the effectiveness of the NSB depends on its design and implementation (Fewings, 2023). Key et al (2021) NBS should encompass the protection, restoration and sustainable management of diverse ecosystems, including wetlands, grasslands and habitats (University of Oxford (naturebasedsolutionsinitiative.org), 2023)), not just tree planting. The authors also highlight the importance of prioritizing local species and ecosystems to maximize the benefits of biodiversity.

The Georgian NBS strategy must comply with best practices by defining clear goals to increase biodiversity, preserve and restore natural habitats. This will require a comprehensive monitoring system that goes beyond simple tree cover measurements. Multiple dimensions

of ecosystem health, including composition, structure, and genetic function, species, community, and landscape scales (Key et al., 2021). The Paris Agreement (United Nations, 2015) underlines the importance of conserving and improving greenhouse gas sinks and reservoirs, including forests, and calls on parties to take action to reduce deforestation and degradation (REDD+) emissions. Georgia's strategy will benefit from greater alignment with these provisions of the Paris Agreement, by setting clear goals and targets for forest conservation, restoration and sustainable management.

It should be noted that in the energy, transport and industrial sectors of Georgia, NBS should not be considered as a substitute for emissions reduction. Work to reduce emissions must continue actively in parallel with the integration of nature-based solutions.

STRENGTHENING THE IMPLEMENTATION OF THE NSB IN GEORGIA

To effectively reflect the NBS in Georgia's climate strategy and share global best practices, Georgia could consider:

- Establishing specific, measurable goals for the protection and restoration of a wide range of ecosystems other than forests, such as wetlands, grasslands, marine and riparian habitats;
- Protection and improvement of biodiversity as a clear goal of the NBS actions with clear indicators and monitoring mechanisms;
- Involvement of local communities in the development, implementation and monitoring of NBS, ensuring their free, prior and informed consent and respect for their rights and knowledge;
- Emphasizing that the NBS should complement, not substitute, the ambitious efforts to phase out fossil fuels and decarbonize the economy.

The NBS can be considered a key component of Georgia's climate strategy. With proper planning (Pörtner et al., 2022; UNEP, 2022), Georgia can ensure long-term benefits for climate, nature, and people.

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