## GERS and Biological Sciences

# Exploring Nature-based Solutions in Agrifood Systems for Climate Resiliency and Food Security

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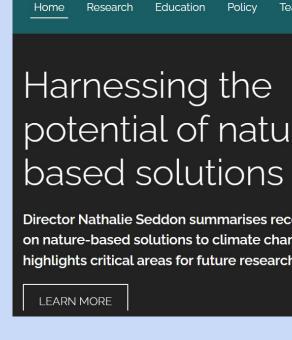
## Abstract

The term "nature-based solutions" (NbS) is emerging a research framework in higher education, governmental and NGO communities and refers to "a sustainable management approach of natural resources using natural features and processes in addressing social-ecological challenges." NbS can be climate resilience strategies and is now being embraced in some agrifood systems. We performed a bibliometric analysis in the SCOPUS database and as of November 3, 2022 discovered that the term "nature-based solutions" appeared in the title, abstract or keywords in 2,244 publications between 2012 and 2022 with 518 (23%) containing agriculture and biological sciences subject matter, 1683 (75%) environmental science subject matter, and 770 (34%) social science subject matter. More than 66% of the publications appeared in 2021 and 2022. Some of the publications with agriculture/food systems NbS content overlapped with terms such as agroecology, regenerative agriculture, sustainable agriculture, and organic agrifood systems. NbS may provide additional transdisciplinary approaches and insights to build climate resilience and food security in agrifood systems. However, we must also remain vigilant to address some concerns that NbS may be used for greenwashing. Some examples of NbS approaches to agrifood systems will be shared and discussed.

## **Research Questions:**

Can nature-based solutions be integrated into agrifood systems' transformation to build climate resiliency and food security? If so, under what conditions?

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Science SPECIAL ISSUE REVIEW

NATHALIE SEDDON (D)

Methods:

Literature review using the key term "nature-based solutions" (NbS) in Scopus Database with search of this keyword phrase in the Title, Abstract, and Keywords field for years 2012-2022. Reviewed recent reports by governments and non-profit organizations.

University of Oxford's Nature-based Solutions Initiative may serve as an example of what can be done:

# potential of nature-

on nature-based solutions to climate change and ighlights critical areas for future researc



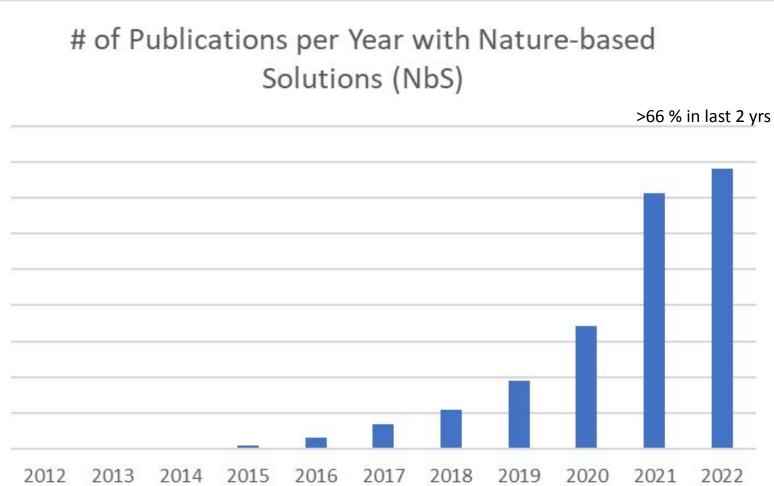


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#### Harnessing the potential of nature-based solutions for mitigating and adapting to climate change

#### **Relevant Literature: SCOPUS Bibliometric Analysis with examples**

- 518 of 2,244 publications in Agriculture and Biological Sciences
- 770 of 2,244 publication in Social Science
- 1,682 or 2,244 publication in Environmental Sciences
- 66% publications in the last 2 years



# **Global Change Biology**

GCB REVIEW 🖻 Open Access 💿 🛈

#### Getting the message right on nature-based solutions to climate change

Nathalie Seddon 🔀, Alison Smith, Pete Smith, Isabel Key, Alexandre Chausson, Cécile Girardin, Jo House, Shilpi Srivastava, Beth Turner

First published: 01 February 2021 | https://doi.org/10.1111/gcb.15513 | Citations: 115

#### Land Gap Report 2022: Possible Greenwashing

## In Response to Climate Change, Governments are Relying on Land for Carbon Dioxide Removal.

We calculated how much land is included in pledges: 1.2 billion hectares. That's the size of the world's food-producing base.

> FULL REPORT



## Land Gap Calculator

Quantifying the area of land required to achieve carbon removal goals in country climate pledges reveals both an unrealistic expectation for land-use change and an encouraging focus on restoring and egenerating degraded lands.

ncreased reliance on land for carbon dioxide removal increases the risk of overshooting warming thresholds and of dangerous climate impacts. The legitimacy of net zero climate goals is dependent on apid decarbonization rather than over-relying on removals, particularly from land

Increased demand for land as a 'carbon sink' exacerbates land conflicts and food insecurity, escalating climate injustice by framing land for its carbon removal potential, since land has multiple uses.



Summary – October 2022

About this summary

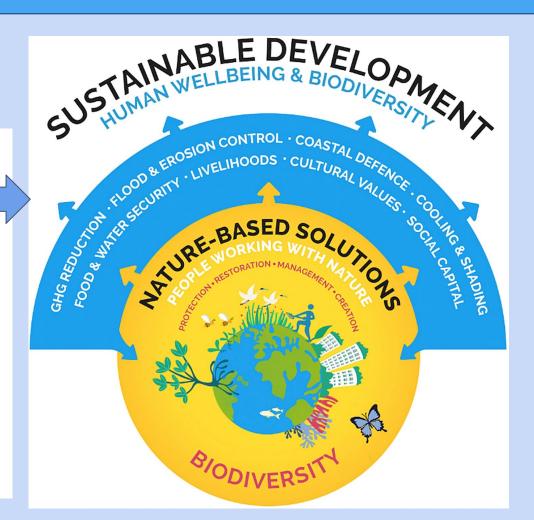
This document summarises a paper produced by UNEP synthesising the current state of knowledge and key actions to translate Nature-based Solutions (NbS) commitments into action. The full report, Nature-based Solutions: Opportunities and Challenges for Scaling Up (ISBN: 978-92-807-3966-4), can be found here: https://www.unep.org/res

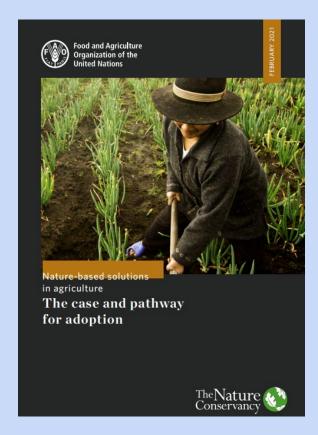
Box 1: What are NbS?

In 2022, the United Nations Environment Assembly (UNEA) delivered a mul nature-based solutions are actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial reshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and daptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits."



LAND GAP CALCULATOR





#### Next steps:

- Deeper dive into the literature focusing on agrifood systems, climate resiliency, and food security.
- Evaluate greenwashing claims and how these claims might undermine NbS applied to agriculture and food systems

#### **References:**

University of Oxford Nature-based Solutions Initiatives

Land Gap Report 2022. Land-Gap-Report-2022.pdf (landgap.org)

United Nations Environment Programme. 2022. Nature-based Solutions: Opportunities and Challenges for Scaling Up - Summary. https://wedocs.unep.org/20.500.11822/40822

United Nations FAO Nature-based Solutions in Agriculture Website: Agriculture Nature-Based Solutions | Land & Water | Food and Agriculture rganization of the United Nations | Land & Water | Food and Agriculture <u> Drganization of the United Nations (fao.org)</u>

#### **Acknowledgements:**

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