

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B

BIOLOGICAL SCIENCES

The role of soils in delivering Nature's Contributions to People

A theme issue compiled and edited by Pete Smith, Saskia D Keesstra, Whendee L Silver and Tapan K Adhya

Published August 2021



THE
ROYAL
SOCIETY
PUBLISHING

About this issue

Nature provides services that contribute to human prosperity, health and wellbeing. These services are called ecosystem services, or 'Nature's Contributions to People' (NCPs). The papers in this issue show that that soils can contribute positively to the delivery of all of the 18 services identified under the NCPs framework. Soils are also shown to contribute positively to the UN Sustainable Development Goals.

These contributions can be maximised through careful soil management which provide healthy soils, but poorly managed, degraded or polluted soils may contribute negatively to delivery of NCPs. The careful management of soils is not just desirable, it is essential if we sustain a healthy planet and if we are to deliver sustainable development in the decades to come.

Access content online at bit.ly/PTB1834

Purchase the print issue at the reduced price of £35 (usual price £65) by visiting the above web page and entering the promotional code **TB1834** or contact:

Turpin Distribution

T +44 1767 604951

E royalsociety@turpin-distribution.com

For more information, contact:

The Royal Society

6 – 9 Carlton House Terrace

London

SW1Y 5AG

T +44 20 7451 2500

E philtransb@royalsociety.org

Front image: Soil protection safeguards its ecosystem services for future generations. The cover photograph shows an organic vineyard in Moixent, Valencia, Spain. Image © Saskia D. Keesstra.

Introduction: The role of soils in delivering Nature's Contributions to People

Pete Smith, Saskia D Keesstra, Whendee L Silver and Tapan K Adhya

The role of soil in the contribution of food and feed

Whendee L Silver, Tibisay Perez, Allegra Mayer and Andrew R Jones

Earth as construction material in the circular economy context: practitioner perspectives on barriers to overcome

Jean-Claude Morel, Rabia Charef, Erwan Hamard, Antonin Fabbri, Chris Beckett and Quoc-Bao Bui

The role of soils in provision of energy

Jo Smith, Jenny Farmer, Pete Smith and Dali Nayak

The role of soils in provision of genetic, medicinal and biochemical resources

Sören Thiele-Bruhn

The role of soils in learning and inspiration, physical and psychological experiences, and in supporting identities

Pamela McElwee

The role of soil in regulation of climate

Rattan Lal, Curtis Monger, Luke Nave and Pete Smith

The role of soils in regulation and provision of blue and green water

Saskia Keesstra *et al.*

The role of soils in regulation of freshwater and coastal water quality

Kun Cheng *et al.*

The role of soils in the regulation of hazards and extreme events

Patricia M Saco, Kelsey R McDonough, Jose F Rodriguez, Johanie Rivera-Zayas and Steven G Sandi

The role of soils in habitat creation, maintenance and restoration

Gerlinde B De Deyn and Lammert Kooistra

The role of soils in the regulation of air quality

Donna Giltrap, Jo Cavanagh, Bryan Stevenson and Anne-Gäelle Ausseil

Role of soil in the regulation of human and plant pathogens: soils' contributions to people

Sandipan Samaddar *et al.*

The role of soils on pollination and seed dispersal

Luísa G Carvalheiro, Ignasi Bartomeus, Orianne Rollin, Sérgio Timóteo and Carla Faleiro Tinoco

The role of soils in the regulation of ocean acidification

Phil Renforth and James S Campbell

The role of soils in the disposition, sequestration and decontamination of environmental contaminants

Binoy Sarkar, Raj Mukhopadhyay, Sammani Ramanayaka, Nanthi Bolan and Yong Sik Ok

Soil-derived Nature's Contributions to People and their contribution to the UN Sustainable Development Goals

Pete Smith *et al.*