WASWAC

HOT NEWS

07, 2025

HOT NEWS

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CONTENTS

Editor: Pengfei DU

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The Post-conference Training Fee Decreased to $250

Resilient Landscapes: Innovations and Traditions in Climate-Adaptive Soil and Water Conservation (RISE-SWC)

September 15th—17th, 2025

Training: "Youth Capacity for Resilient Soil and Water Conservation in a Changing Climate "

September 18th—19th, 2025

Participants may attend only the RISE-SWC, only the Training, or both.

RISE-SWC registration fee:

- Delegates (Non-members): USD 350
- WASWAC Members: USD 300
- Councilors of WASWAC or Editorial Members of ISWCR: USD 250
- Students: USD 250
- Accompany Person: USD 200

To benefit more participates, the participation fee for the Training Program has been revised to $250 for all attendees. Previously it was between $250 to $350.

The registration date for the RISE-SWC and Training is 14th September 2025. If you are only attending the Training, please complete your registration on the 17th.

Info Updates

https://book.aatif2025.com/#

https://rise-swc.com/

www.waswac.org.cn

www.inra.org.ma

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Conference Venue

Institut National de la Recherche Agronomique (INRA), Avenue de la Victoire BP 415, 10090 Rabat, Morocco.

WE-CARE-2025: Worldwide Efforts on Cutting-Edge Approaches for Restoring Saline Ecosystems

Conference Abstract Themes

This conference aims to explore the challenges and solutions for the sustainable management of salt-affected soils. It will focus on the latest technological advancements and research in soil reclamation, environmental quality, soil health improvement, and climate change adaptation and mitigation strategies. The conference will also emphasize the importance of food security and the role of salt-affected soil restoration in achieving sustainable agriculture. The key objectives of this conference typically focused on addressing the challenges and strategies involved in restoring and preserving saline ecosystems. The objectives include:

Theme-1: Advancements in approaches to characterize, delineate and map salt-affected and stress-prone ecologies

- Developments in characterization of salt-affected soils, water and habitats
- Uptrends in remote/proximal sensing, GIS and spectroscopy for delineation, mapping and real-time monitoring of saltaffected/ stressed ecologies

Theme-2: Developments in the reclamation of salt-affected/stressed ecologies

- Renements in amendments and methodologies for reclamation of salt-affected soils and water
- Renaissances in productive management of salt and water-stressed agro-ecosystems
- Alternate land uses for gaining remuneration and eco-services on salt-affected ecol-

ogies

Theme-3: Evolutions in multi-stress tolerance development in crops for sustainability of saline ecologies

- Advancements in understanding of physiological mechanisms of salt tolerance in plants
- Progress in breeding approaches and evolution of crops, varieties and cropping systems for salt-stressed ecosystems

Theme-4: Salt-stressed ecologies v/s climate change

- Impact of climate change on salinization processes and carbon sequestration
- Climate change resilience strategies for sustainable agriculture in salt-stressed conditions

Theme-5: Socio-economic dimensions, eco-services and policy-governance of saline ecosystem restoration

- Socio-economic impacts of salinity on farmers, communities and eco-services
- Approaches and policy interventions to engage farmers, local communities, FPOs, NGOs, government entities and the private sector for effective restoration of salt-stressed ecosystems

Theme-6: Special session on "Sustainable Coastal Agriculture”

Important Dates

Conference dates: 29 October—01 November 2025

Abstract submission begins: 01st May to 01st October 2025

Early bird registration commences: 01st May to 10th September 2025

Abstract Acceptance closes: 05th October 2025

Regular-registration closes: 10th September to 15th October 2025

On-site Registration: 28-29 October 2025

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News Resource

https://wecare2025.eventsdashboard.in

China's Green Energy Solution Powers Sustainability while Combating Desertification

This photo shows the Tiger Neo N-type solar panels with a capacity of 100 MW provided by JinkoSolar for the photovoltaic sand control project in Alashan League, North China's Inner Mongolia autonomous region.

China is leveraging its vast desert regions to develop large-scale solar and wind power bases that not only generate clean energy but also play a vital role in reversing desertification, offering a replicable model for global sustainable development.

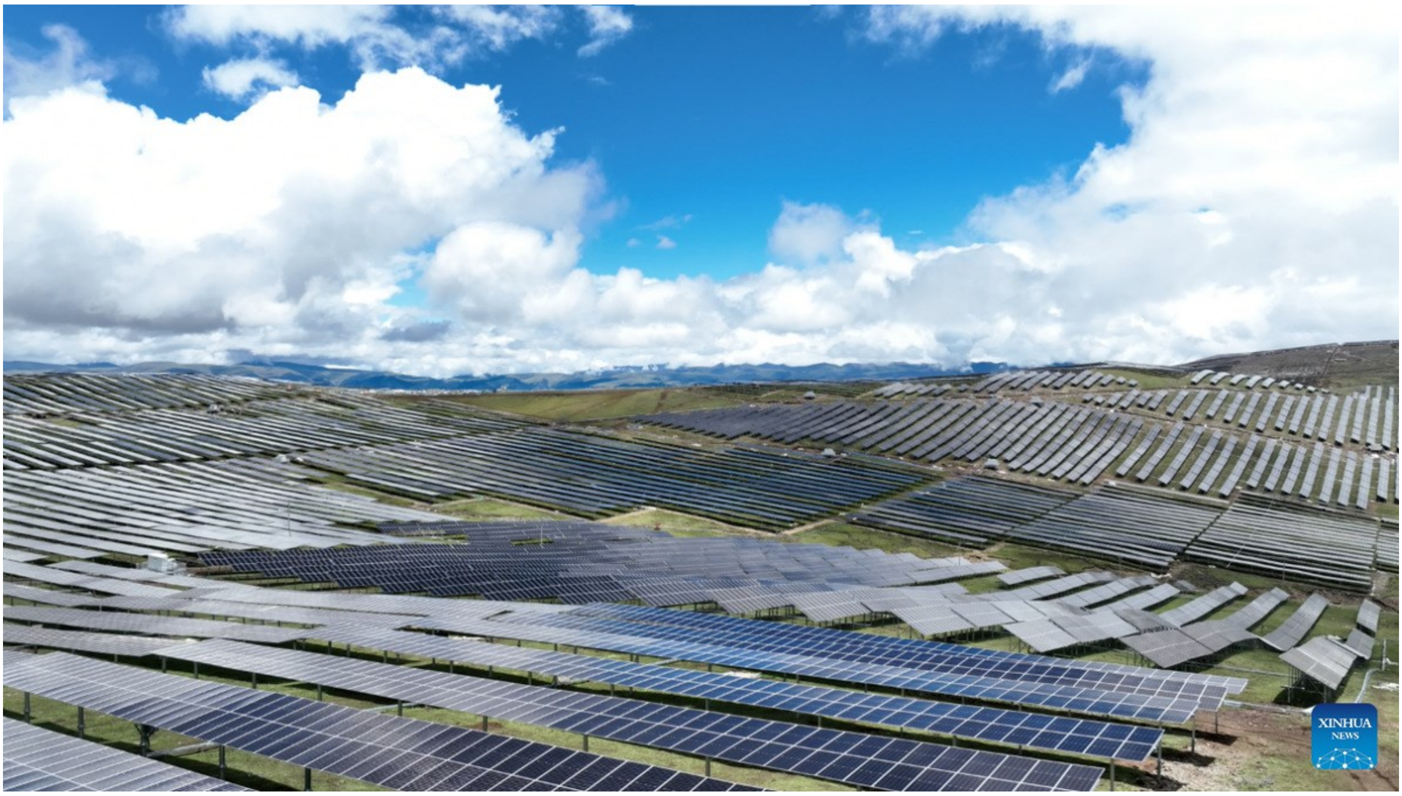
At the 2025 Summer Davos Forum held in Tianjin, Qian Jing, global vice-president of JinkoSolar, a global leading PV supplier, shared insights into how China's photovoltaic (PV) projects are transforming arid zones into renewable energy hubs. The presentation drew strong interest from international delegates.

Known collectively as "Shagehuang," a Chinese term referring to deserts, gobi, and barren lands, these regions feature abundant sunlight and minimal rainfall -- conditions ideal for solar power. However, they are also among the most severely desertified regions in the world.

China has undertaken extensive ecological restoration projects in these areas. Over 53 percent of treatable desertified land is now under effective control, thanks to integrated efforts such as afforestation, rotational grazing, and PV-driven land rehabilitation.

By 2030, the total installed capacity of these projects is expected to reach 455 GW -- equivalent to the output of 20 Three Gorges Hydropower Station.

Integrating massive renewables into the grid will transmit clean energy from Gobi Desert bases to remote consumption centers 2,000-3,000 km away, said Pang Xiaogang, general manager of State Grid Corporation of China at



This photo shows the Tiger Neo N-type solar panels with a capacity of 287.4 MW provided by JinkoSolar for the Yalong River hydro-photovoltaic complementary project in Kela township of Yajiang county, Garze Tibetan autonomous prefecture, Southwest China's Sichuan province.

This photo shows the Tiger Neo N-type solar panels with a capacity of 100 MW provided by JinkoSolar for the Dayao Dapingdi Phase II photovoltaic project in Dayao county, Chuxiong Yi autonomous prefecture, Southwest China's Yunnan province.

the Summer Davos.

"In these regions, solar plants are being integrated with water-saving solutions like PV-powered pumps and desalination systems," said Qian. "This helps tackle both energy and water shortages in harsh desert environments."

"Mongolia, with its vast underutilized solar potential, could benefit greatly from China's experience," said Battushig Myanganbayar, founder and CEO of Implicit AI Inc., after attending the forum. "Partnering with China could help transform the desert into a clean energy hub and support data center development across Asia."

Hu Min, executive director of the Institute for Global Decarbonization Progress, noted that China's systemic model -- combining PV deployment with infrastructure, land use, and energy storage -- offers valuable insights for other countries pursuing green development.

Professor Xue Yongji of Beijing Forestry University added that building large-scale renewable energy projects in desert areas promotes synergy among green power generation, ecological restoration, and sustainable agriculture.

"These efforts support China's carbon goals while creating new green growth engines in arid regions," Xue said. "It is a practical and scalable model for countries seeking both environmental resilience and sustainable economic development."

News Source

https://www.chinadaily.com.cn/a/202506/26/WS685cfcb4a310a04af22c8add.html

Prediction of Soil Erosion Control Ecosystem Service Using Machine Learning Based on the ANN Model in Asia

Highlights

- The ANN model predicted 98 % of SEC-ES changes using factors like soil moisture, VHI, and NDVI.
- Soil moisture at 70 cm depth had the highest impact on the model, while air temperature had the least.
- Machine learning in predicting ESs provides an effective approach to sustainable land management in erosion-prone areas.

Abstract

The impact of climate change on soil erosion control is one of the main consequences of climate change on ecosystem services, as it increases the risk of soil erosion. Soil erosion control is a critical ecosystem service that plays a key role in regulating agricultural sustainability, preventing land degradation, and ensuring food security. However, it is highly influenced by climatic and environmental changes. This study aims to predict the effects of climatic and environmental variables on soil erosion control ecosystem services using an artificial neural network model in Asia. Two datasets were collected: soil erosion control data derived from satellite imagery and climatic and environmental variables, including DEM, Normalized Difference Vegetation Index, Slope, Air Temperature, Land Surface Temperature, Soil Moisture, Temperature Condition Index, Vegetation Condition Index, Vegetation Health Index, and Precipitation. The findings showed that the R2 for the prediction model is 0.98, suggesting that artificial neural networks can predict 98 % of the variations in soil erosion control ecosystem service based on climatic and environmental variables. Sensitivity Analysis results revealed that soil moisture (at 70 cm depth) and vegetation health index significantly influence the model. This approach can highlight the potential of Machine Learning Algorithms for predicting various Ecosystem Services and acts as a future research blueprint. Its practical implications support the development of sustainable land management strategies in Asia.

Introduction

To address the research gap, the main objective of this study is to predict the impacts of climatic and environmental variables on SEC-ES using an ANN model in Asia. The primary research question is: How can ANN effectively predict SEC-ES across Asia based on climatic and environmental variables? To answer this question, a set of climatic and environmental variables was compiled and analyzed through an ANN model. Therefore, the following hypotheses were defined: ANNs, when trained on relevant climatic and environmental data, can accurately predict SEC-ES across various Land use/Land cover (LULC) in Asia, thereby serving as an effective tool for environmental management and conservation planning. Therefore, this study was conducted with the following objectives:

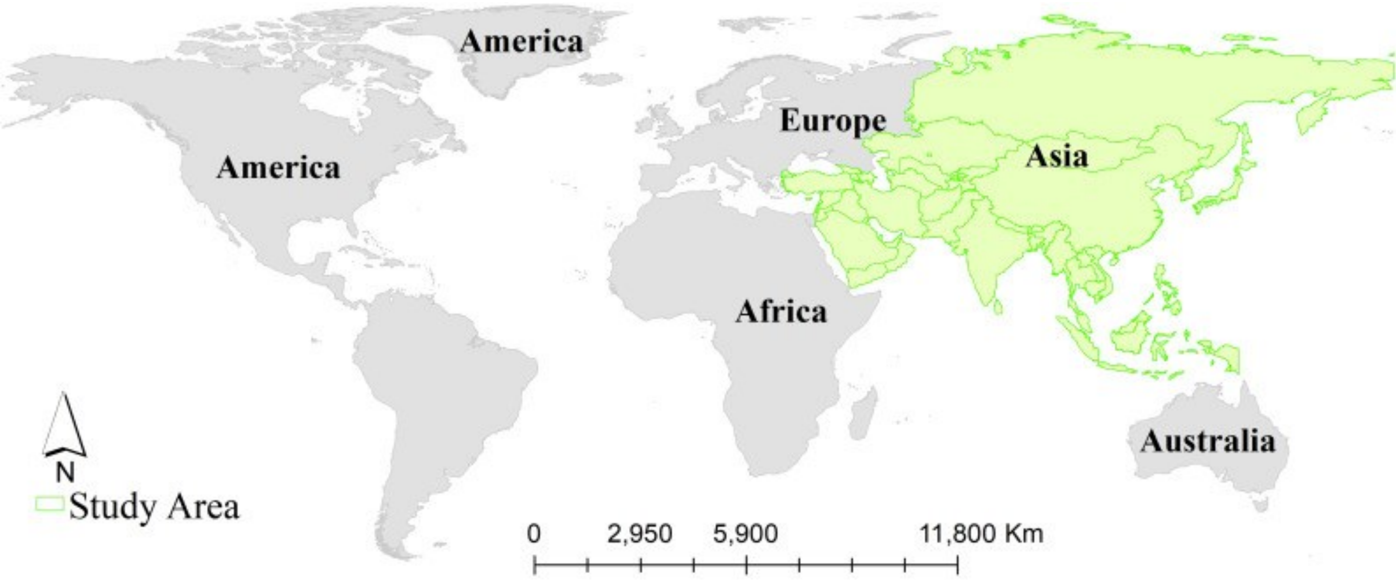
1) To develop an ANN-based model for predicting SEC-ES in Asia.

2) To assess the performance of the ANN model using key climatic and environmental variables, including Digital Elevation Model (DEM), Normalized Difference Vegetation Index (NDVI), Land Surface Temperature (LST), Soil Moisture, Temperature Condition Index (TCI), Vegetation Condition Index (VCI), Vegetation Health Index (VHI), and Precipitation.

3) To identify the most influential variables affecting SEC-ES using ANN-based techniques.

Study Area

Asia is the largest and most populous continent, covering approximately 30 % of the Earth's area with a total surface area of 44 million km.2 It encompasses various climatic, geographical, and biological zones-from Middle Eastern deserts to Southeast Asian rainforests and the high-altitude environments of the Himalayas (Qian and Ricklefs, 2000). This immense diversity results in a remarkable variety of ecosystems, natural resources, and agricultural lands, all of which play a critical role in SEC-ES (Qian et al., 2022). It is experiencing a range of environmental changes, including increasing temperature, decreasing precipitation, increasing heavy rainfall in other regions, melting glaciers, and rising sea levels (Munslow and O'Dempsey, 2010). These climatic shifts are expected to exacerbate soil erosion risks due to changed rainfall intensity and flooding (Borrelli et al., 2017). Moreover, rising earth temperatures and changing climatic patterns are affecting vegetation dynamics and reducing the ecosystems' capacity to control soil erosion. Given these challenges, this study aims to predict SEC-ES in response to ongoing climatic and environmental changes. The study area is shown in Fig. 1.

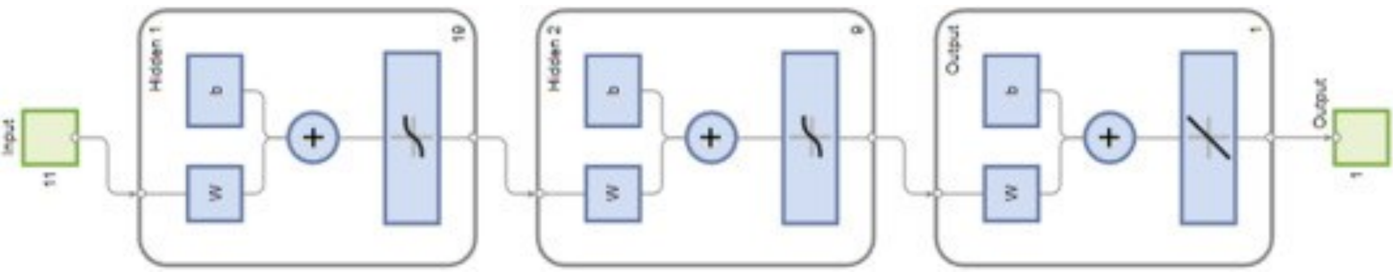


Collecting the Dataset

Two types of datasets were collected for monitoring SEC in Asia for the year 2020. (a) SEC values obtained from satellite images, and (b) Climatic and environmental variables, including DEM, NDVI (Jin et al., 2021), Slope, LST, Soil moisture (Sachs and Sarah, 2017), TCI, VCI, VHI (Mokarram and Zarei, 2023), Air temperature, and Precipitation (Cawson et al., 2016). The spatiotemporal distribution of all variables was generated using RS and the Google Earth Engine (GEE) platform (See Table 1 for more information on these datasets). 180 major cities across Asia were selected, and all values were extracted as an Excel dataset using ArcMap. The data were normalized to a 0–1 scale and prepared for ANN modeling using MATLAB V 2024.

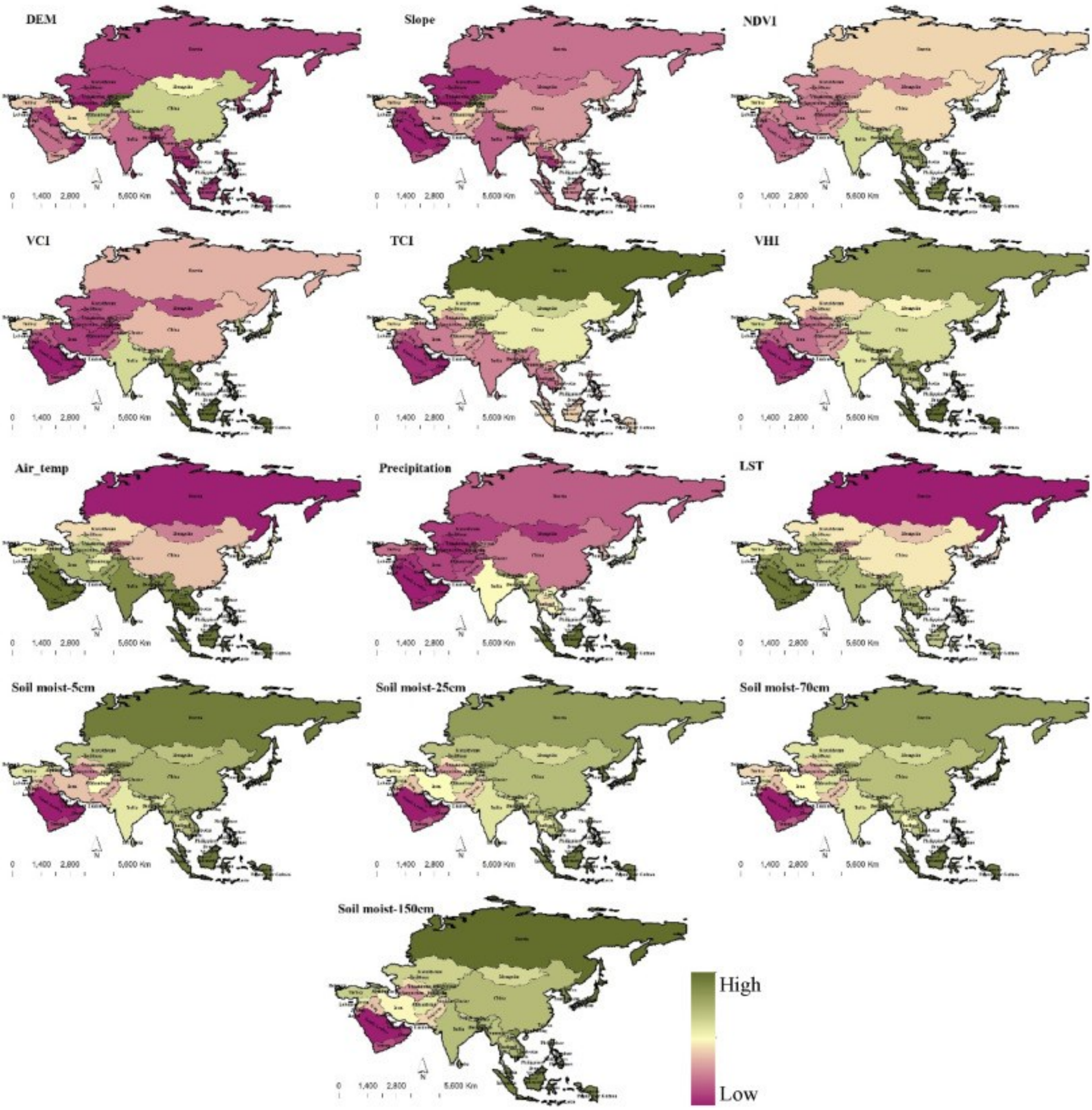
Artificial Neural Network (ANN)

An Artificial Neural Network (ANN) is a powerful artificial intelligence (AI) tool (Ryo, 2024) widely used for data analysis and prediction in MATLAB. The ANN model has high predictive capabilities by dividing the dataset into training, validation, and test us-



ing the functions and tools. Data preparation is the first step in implementing an ANN model. These data typically need to be converted into a suitable format for the model (MathWorks, 2020). Following data preparation, the network design starts. Here, users can create neural networks using various tools and ML algorithms (MathWorks, 2024). During this phase, the ANN adjusts weights and biases to reduce prediction errors. Once the input data is processed, the data is transferred to the hidden layers, where neurons process weights and activation functions. The final prediction phase is generated using built-in prediction functions provided in MATLAB (Abdolrasol et al., 2021), such as the predict function (MathWorks, 2024). Then, the predicted values are compared with the actual observations to calculate the Mean Squared Error (MSE). Network performance was measured using the MSE and the correlation between observed and predicted values.

The results of the input variables in the ANN model, as shown in Fig. 10B, indicate that the highest mean soil moisture at a depth of 70 cm was observed in Papua New Guinea, Baikonur, Japan, Malaysia, and Indonesia, while the lowest was recorded in Oman, Yemen, and Jordan. The vegetative health index, or VHI, is highest in Brunei, Malaysia, Indonesia, and Japan and lowest in the United Arab Emirates, Oman, Kuwait, Saudi Arabia, and Qatar. Regarding NDVI, the highest NDVI values are found in Brunei, Malaysia, the Philippines, Indonesia, Sri Lanka, and Laos, whereas the lowest were observed in Siachen Glacier, Qatar, Kuwait, Saudi Arabia, and the United Arab Emirates. The countries with the highest mean air temperature are Oman, United Arab Emirates, Cambodia, and Qatar, while the lowest are in Siachen Glacier, Russia, Tajikistan, and Kyrgyzstan.



Read More

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Combining Science and Policy for a Unified Global Soil Biodiversity Observatory

The effective conservation of soil biodiversity and ecosystem services in the face of global-change threats requires improvements in national monitoring. We outline the Global Soil Biodiversity Observatory, an initiative that aims to develop standardized indicators and enhance national monitoring capacities to support evidence-based policymaking and facilitate global assessments.

Soil is a non-renewable resource that harbours more than half of the world's biodiversity. This biodiversity provides vital ecosystem services that include food production, clean water, and the storage and cycling of materials, energy and nutrients, but is increasingly threatened by global change pressures such as population growth and climate change. Degradation of soils has heightened global awareness of their value as natural resources from both governance and scientific perspectives: for example, the 15th meeting of the Conference of the Parties (COP15) (see Box 1 for glossary of terms) to the Convention on Biological Diversity (CBD) adopted the 2020–2030 Plan of Action of the International Initiative for the Conservation and Sustainable Use of Soil Biodiversity (Decision 15/28).

Standard Indicators are Needed

One of the requirements for monitoring biodiversity within the KM-GBF is that all parties have the capacity to measure key indicators, also known as headline indicators. The two indicators that currently address soils are an agrobiodiversity index and changes in soil organic carbon stocks8. However, these represent only a limited assessment, and the full complexity of soil biodiversity and metabolic interactions that regulate biogeochemical cycles and other ecosystem functions are not being considered. The agrobiodiversity index for example is a composite of 22 indicators9, one of which is a soil biodiversity index calculated by examining the distribution of microbial soil carbon and the distribution of the soil macrofauna community10. Although measurements of soil organic (and microbial) carbon and soil macrofauna groups are readily available in most countries and highlight general trends and global patterns in soil quality, new global soil biodiversity monitoring initiatives will require defining improved soil biodiversity indicators and building capacity to validate policy agendas aimed at conservation and sustainable management practices6.

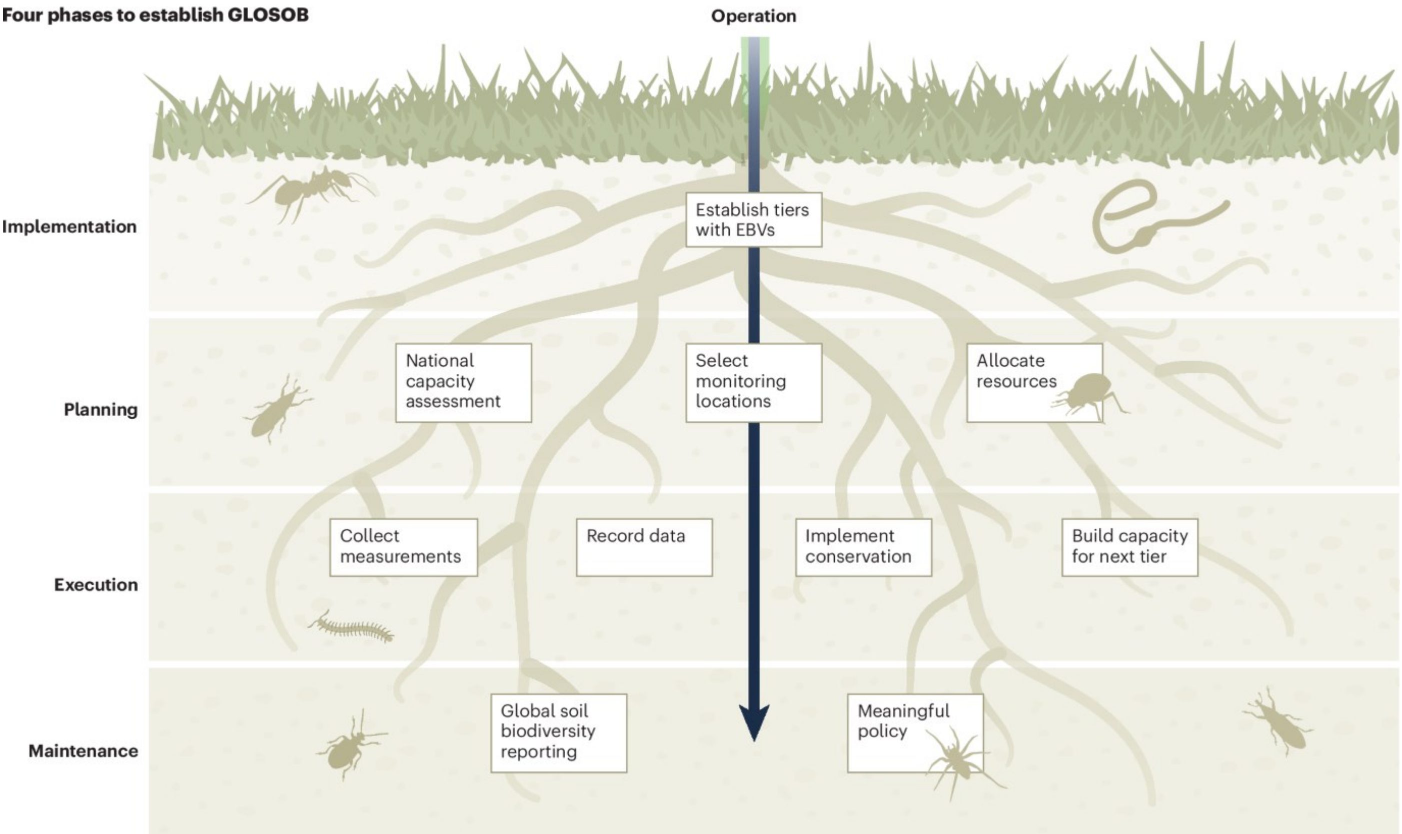
Priorities for a successful soil biodiversity observatory

Implementing GLOSOB relies on coordinated national contributions to provide a global overview of soil biodiversity, and implies understanding the needs and current monitoring infrastructure that are available across nations and key stakeholders. To be successful, GLOSOB will:

- Standardize methods for measuring improved soil biodiversity headline indicators;
- Integrate biodiversity into conventional soil surveys and national soil information systems;
- Increase support (including funding and capacity building), and institutional support for countries where biodiversity has not been part of soil assessments and surveys;
- Increase awareness of the role and value of soil organisms at multiple scales and their functions for ecosystem service delivery and practical applications;
- Improve interaction of biodiversity and soil biodiversity indicators with information on best practices, economic models, and with policy and legal frameworks designed to protect and restore soil biodiversity at national and international levels as part of the KM-GBF.

Conscious of the disparities in capacities and infrastructure of parties to measure the different soil biodiversity groups, participation in GLOSOB has been designed in three tiers (Fig. 1) of established EBVs6 (Table 1). Parties that participate at lower tiers are encouraged to expand capacity and resources to measure all EBVs over time.

The first phase to establishing GLOSOB is defining the standardized EBVs to be collected and placing them in a tiered system so that all parties are able to join and collect soil biodiversity measurements, while building capacity to advance to additional measurements (eventually collecting all EBVs). These variables and their corresponding tiers have been adopted by parties of the GSP and are outlined in Table 1. The other phases are driven by the country (with input from academic re-



searchers, nongovernmental organizations, Indigenous peoples and ministry officials) with GSP assistance where requested. These phases include assessing national capacities and appropriate tier, determining monitoring locations (including agricultural, natural and urban soils), and allocating resources. The execution phase of GLOSOB includes collecting samples, measuring EBVs, recording data in a shareable database, implementing soil biodiversity conservation practices and building capacity to advance to the next tier. We also recommend including soil EBVs in other national soil surveys. The final phase is interpretation of GLOSOB soil biodiversity data to provide reports and progress to parties, and give policymakers the information needed to promote sustainable practices.

Read More

https://www.nature.com/articles/s41559-025-02754-z

Contents of Issue 4, 2025 for IJSR

Pages 588-599

https://www.sciencedirect.com/science/article/pii/S100162792500037X

Environmental evolution of coastal regions in northern Beibu Gulf, South China, based on sedimentary elemental records and carbon-nitrogen isotope composition

Jing Guo, Zihan Pan, Xiaomin Yan, Man Wu, ... Guilin Xu

Pages 600-615

https://www.sciencedirect.com/science/article/pii/S1001627925000381

Can desert phreatophytic trees enhance recharge through sediment-clogged reservoirs of recharge dams in Arabia?

N. Al-Kharousi, A.R. Kacimov, A. Al-Maktoumi, S.S. Al-Ismaily

Pages 616-626

https://www.sciencedirect.com/science/article/pii/S1001627925000344

Performance of microbially induced calcite precipitation (MICP) as a local scour countermeasure for offshore wind turbine monopile foundation

Zihao Tang, Bruce W. Melville, Naresh Singhal, Asaad Y. Shamseldin, ... Dawei Guan

Pages 627-650

https://www.sciencedirect.com/science/article/pii/S1001627925000423

Effects of land management practices on runoff and soil and nutrient losses in the rainfed agroecosystem of the Beles River Basin, Ethiopia

Yenesew Assaye, Gizaw Desta, Eyayu Molla, Zenebe Adimassu

Pages 651-665

https://www.sciencedirect.com/science/article/pii/S1001627925000265

Evaluating critical hydrodynamic characteristics of rill formation on saturated soil slopes

Dandan Li, Xiaoyan Chen, Pingzong Zhu, Wenhao Tan, ... Lingyong Kong

Pages 666-674

https://www.sciencedirect.com/science/article/pii/S1001627925000459

Analytical simulation of meander morphology from equilibrium to long-term evolution: Impacts of channel geometry and vegetation-induced coarsening

Yanjie Sun, Xiaolong Song, Zhi Li, Haijue Xu, Yuchuan Bai

Pages 675-689

https://www.sciencedirect.com/science/article/pii/S100162792500023X

CFD modeling of movement of geobag for riverbank erosion control structures

Saman Shabani, Yuntong She, Carlos Frederico Lange

Pages 690-700

https://www.sciencedirect.com/science/article/pii/S100162792500006X

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