WASWAC

HOT NEWS

06, 2026

HOT NEWS

ISSUE 06 2026

WASWAC

CONTENTS

Editor: Pengfei DU

Assistant Editor: Songdi YANG

WASWAC Advances Cooperation with INSER

On 9 June, Dr. Haijing Shi, Soil Erosion Consultant at the Food and Agriculture Organization of the United Nations (FAO), visited the WASWAC Secretariat for discussions with Prof. Duihu Ning, President of WASWAC, and Prof. Baoyuan Liu, Chair of the First Technical Working Group of the International Network on Soil Erosion (INSER) and Deputy President of WASWAC.

Dr. Shi outlined the overall plans and next-step requirements for all INSER technical working groups. She expressed her hope to further expand international cooperation in soil erosion and related fields by leveraging WASWAC's global expert network, as well as its platforms, including international conferences and its official academic journal.

Prof. Ning responded positively, affirming that WASWAC will support expert nomination, information exchange, and technical proposal assessment. He emphasized that WASWAC will collaborate with the working group to gradually refine operational frameworks and jointly advance global soil erosion mapping. Prof. Liu presented an overview of his working group alongside a clear action

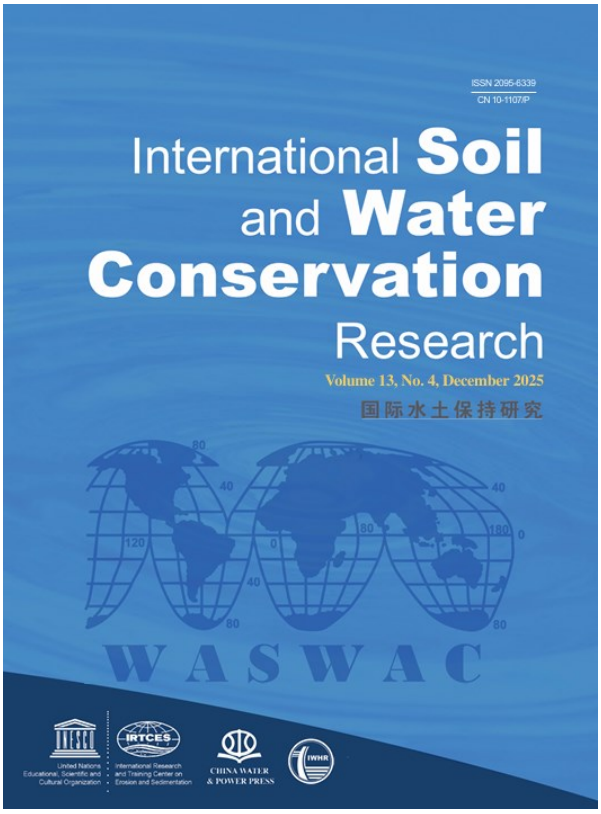
plan to develop monitoring systems, standardize mapping, and formulate technical specifications.

Participants agreed that the working group is currently at a critical initial stage. Priorities include streamlining operational frameworks, confirming team composition, refining task allocation, and setting timelines to ensure the steady delivery of all work. WASWAC will maintain regular contact with INSER and deepen cooperation on technical standards development, personnel training, and academic exchanges.

Prof. Pengfei Du, Executive Deputy Secretary-General of WASWAC, also attended the discussion and outlined broad plans for regular liaison and daily coordination.

The International Network on Soil Erosion (INSER) is the eighth technical network under the FAO's Global Soil Partnership (GSP). Its establishment was endorsed by the GSP Plenary Assembly in June 2025, and it was officially launched at the 6th WASWAC World Conference in September of the same year. INSER brings together research institutions and policy bodies worldwide to advance soil erosion monitoring and assessment, promote conservation technologies, quantify economic values, and improve policy frameworks, thereby underpinning global food security and ecological security with science. At its first working meeting in April 2026, INSER elected its Chair and the Chairs of three technical working groups. Prof. Baoyuan Liu and Prof. Fei Wang, both Deputy Presidents of WASWAC, were elected Chairs of the first and third groups, respectively. They lead the work on Measuring, Modelling, and Mapping, and Economic Valuation, Legislation, and Policy.

ISWCR Received its 2025 Impact Factor 8.3



Clarivate officially released the 2025 Journal Citation Reports (JCR) on June 17, 2026. According to the latest JCR, the 2025 Impact Factor of International Soil and Water Conservation Research (ISWCR) - the official journal of the World Association of Soil and Water Conservation (WASWAC) - has risen to 8.3, cementing the journal's standing as a Q1 title in all three of its assigned subject categories: Water Resources, Soil Science, and Environmental Sciences:

Among the 132 SCIE-indexed journals in Water Resources, ISWCR ranks 7th.

Among the 48 SCIE-indexed journals in Soil Science, ISWCR ranks 4th.

Among the 395 SCIE-indexed journals in Environmental Sciences, ISWCR ranks 50th.

Founded in June 2013 and now serving as the flagship publication of WASWAC, ISWCR has steadily built its international reputation over the past decade. The journal received its first Impact Factor 3.77 in June 2020. Subsequent years have seen general growth, with the 2024 IF reaching 7.3 and the 2025 IF now standing at 8.3.

As a quarterly English-language journal, ISWCR provides a leading international forum for original research and review articles on soil erosion, soil and water conservation, conservation agriculture, soil assessment and management, land degradation, watershed management, and sustainable development. ISWCR will continue to serve the global soil and water conservation community by publishing high-quality, impactful research, supporting early-career scientists, and fostering international collaboration on the most pressing challenges facing land and water resources worldwide.

WASWAC Membership Re-registration and New Registration

To deliver better services to all members, maintain accurate and complete membership records and meet updated development requirements, WASWAC opens re-registration for existing members. This initiative serves to update member profiles for consistent and effective communication, upgrade membership certificate formats to reinforce professional credibility, and facilitate future member benefit administration and academic events. Detailes are outlined below:

1. Individual Membership Re-registration

Holders of valid Individual Membership obtained by June 30, 2026 may complete re-registration through the WASWAC Membership Renewal Form on the official website. Applicants are to submit updated personal information and a valid membership certificate. All mandatory fields marked with an asterisk are to be completed accurately, while optional fields can be filled out as applicable. Approved applicants will receive a digital membership certificate. Expired Individual Membership is not eligible for re-registration, requiring a new Individual Membership application.

2. Organization Membership Re-registration

Holders of valid Organization Membership obtained by June 30, 2026 may complete re-registration through the WASWAC Membership Renewal Form on the official website. Applicants are required to provide full institutional details, a valid Organization Membership certificate, and a staff list bearing the official institutional seal. A digital Organization Membership certificate will be issued upon successful review. Expired Organization Membership cannot proceed with re-registration and requires a new Organization Membership application.

WASWAC also welcomes new membership applications. Its procedures are as follows:

3. New Individual Membership Registration

New applicants for Individual Membership may submit registration information via the WASWAC Membership Application Form on the official website. A digital membership certificate will be issued once the application is reviewed and approved.

4. New Organization Membership Registration

New applicants for Organization Membership may submit registration information via the WASWAC Membership Application Form on the official. A digital Organization Membership certificate will be granted upon successful review and approval.

WASWAC is dedicated to advancing technological innovation and professional development in soil and water conservation, serving all members and practitioners. In accordance with official regulations, members enjoy exclusive benefits and access to all WASWAC-hosted academic exchanges, technical training, consulting services and journal publishing activities.

The re-registration period closes on September 30, 2026.

Please contact the Secretariat of WASWAC promptly for any inquiries regarding re-registration or new membership applications.

Contacts

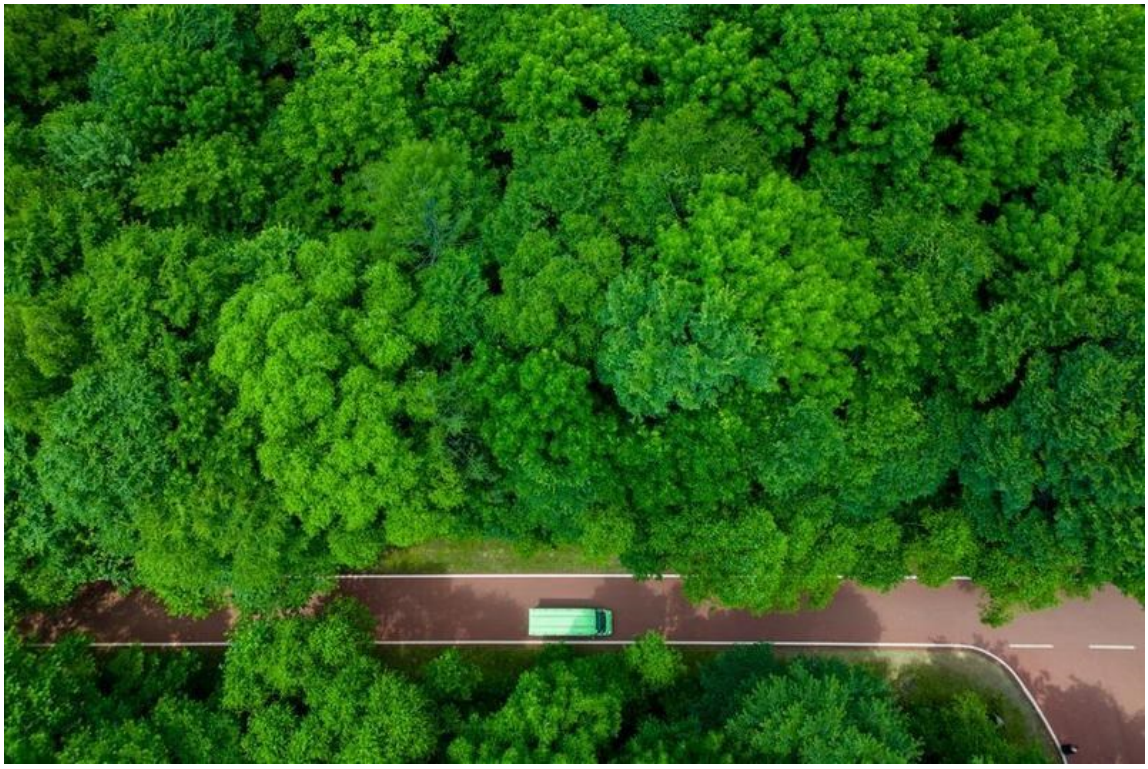
Email: waswac@vip.163.com

Tel.: 86 10 6843 1812

Click or scan to complete the re-registration or new registration:

http://www.waswac.org.cn/waswac/Memberships/webinfo/2015/06/1433324399037291.htm

China Restores over 10m Hectares of Desertified Land in 14th FYP



China restored over 10 million hectares of desertified land and almost 2 million hectares of rocky-desertification land during the 14th Five-Year Plan period (2021-25), according to a media release from the National Forestry and Grassland Administration on Tuesday, which marked the 32nd World Day to Combat Desertification and Drought.

The country's desertified land area has continued to shrink, the administration stressed. From an average annual expansion of 343,300 hectares in the late 1990s, the trend has reversed to a net reduction of 666,600 hectares per year today.

The administration has especially highlighted the progress made under the Three-North Shelterbelt Forest Program, a large-scale afforestation project that spans 13 provincial-level regions.

Since 2023, the central government has invested 88.9 billion yuan ($13.2 billion) in 544 key projects, covering 16.3 million hectares of land, it disclosed.

China has adopted innovative approaches in desertification control as it forges ahead with the program. For instance, it has integrated photovoltaic power generation with desertification control efforts, bringing 353,300 hec-

tares of sandy land under treatment.

Over the years, local governments involved in the program have balanced desertification control with economic development, developing sand-based industries tailored to local conditions, the administration said.

Thanks to these efforts, the total output value of the forestry and grassland industry in the Three-North region reached 800 billion yuan in 2025. The program has also created jobs for local residents, with 1.526 million farmers and herders employed through work-relief programs, receiving 10.24 billion yuan in labor payments, it added.

News Source

https://www.chinadaily.com.cn/a/202606/17/WS6a32705aa310986e2b460906.html

Central Asia Countries Unite to Strengthen Water and Land Management for 60 Million People

The Central Asia Water-Land Nexus (CAWLN) programme launched its implementation phase at the Eighth Assembly of the Global Environment Facility (GEF). Funded by the GEF and implemented by the Food and Agriculture Organization of the United Nations (FAO), the regional programme brings five countries together to advance integrated approaches to land and water management in Central Asia.

On 4 June 2026, ahead of the World Environment Day, ministers and senior officials from Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan addressed growing environmental pressures across the region and explored opportunities for strengthened regional cooperation at a high-level roundtable.

Central Asia is home to ecologically important river and wetland systems, vast grasslands, semi-deserts, deserts, and high mountain ranges that support unique species and habitats. The Amu Darya and Syr Darya river basins are the primary source of water for these systems and support around 60 million people, or about 80 percent of the total population of the five countries. The ecosystems provide essential services to people, including water, food and livelihoods, and their improved management are critical to meeting environmental commitments and achieving the Sustainable Development Goals (SDGs).

At the same time, increasing demand for natural resources and the impacts of climate change are placing growing pressure on these systems. Water availability is an acute concern

in this largely arid region, where limited resources and fragile vegetation are already under stress. Nearly half of the region is affected by land degradation, resulting in estimated economic losses of around USD 6 billion annually.

The CAWLN programme responds to these challenges through a coordinated, science-based and transboundary approach to managing land, water and ecosystems. It is designed to improve the health of agricultural land and watersheds, reduce deforestation and support rural economies, while strengthening water security and resilience across the region.

Participants highlighted that "nexus" approaches, recognizing the interlinkages between land, water, biodiversity and climate systems, are essential to delivering more effective and sustainable outcomes across sectors and national boundaries.

The programme focuses on the Amu Darya and Syr Darya river basins and promotes a transformative approach to managing shared basins at the regional level, while supporting national transition toward sustainable agriculture, biodiversity conservation and climate planning. It will strengthen transboundary and cross-sectoral cooperation, enhance governance frameworks, and build capacities for integrated watershed management.

In practical terms, the programme will support improved earth observation and monitoring systems, including satellite-based tools for decision-making and early warning, while promoting sustainable land management practices and ecosystem restoration. It will also encourage gender-responsive approaches and multi-stakeholder engagement to advance land degradation neutrality and protect biodiversity.

The CAWLN programme is implemented through a coordinated set of regional and national projects across the five countries, addressing shared challenges in river basin management, land restoration and climate resilience.

News Source

https://www.fao.org/europe/news/detail/central-asia-countries-unite-to-strengthen-water-and-land-management-for-60-million-people/en

EUROSION Project Kicks Off in Wageningen to Build a European Soil Erosion Monitoring System

From 20 to 22 January 2026, the EUROSION project (European Soil Erosion Monitoring and Modelling Network for Sustainable Agricultural Land Management) was officially launched during its kick-off meeting in Wageningen, the Netherlands. Partners from across Europe gathered to start a five-year collaboration aimed at developing a dynamic, pan-European system for monitoring and modelling soil erosion.

EUROSION is a Horizon Europe project that integrates field monitoring, Earth observation, process-based erosion models and digital platforms to improve understanding of soil erosion caused by water, wind and tillage. By delivering harmonised, up-to-date and comparable soil erosion information, the project will support evidence-based soil conservation, sustainable land management and the development of European policies.

During the kick-off meeting, participants discussed the project's overall objectives, work package activities and how different expertise will be combined to build a European soil erosion monitoring network and a future dynamic European soil erosion monitoring platform. Sessions focused on monitoring networks, harmonised measurement methods, modelling frameworks, data infrastructures and policy relevance. The International Soil Reference and Information Centre (ISRIC) supports EUROSION by contributing to the harmonisation, preparation and integration of soil datasets at European scale. Drawing on its expertise in soil data infrastructures, spatial soil information and modelling-ready datasets, ISRIC helps to ensure that soil information used in erosion monitoring and modelling is consistent and interoperable.

News Source

https://isric.org/news/eurosion-project-kicks-off-in-wageningen-to-build-a-european-soil-erosion-monitoring-system/

From Degraded Hillsides to Productive Land: Ethiopia's Landscape Management Program

In the highlands of Ethiopia, where centuries of farming on steep slopes have stripped away topsoil and left hillsides increasingly bare, a different kind of change is now visible. Terraced fields hold moisture through the dry season. Community forests are regenerating. Farmers who once watched their land produce less each year are now investing in it. Why? Because, for the first time, they legally own it.

It all happened through the Community Action for Landscape Management Program for Results (CALM), a World Bank-supported initiative that set out to do two things at once: restore Ethiopia's degraded landscapes and secure the land rights of the people who depend on them. The results make the case that these two goals are not just compatible. They are inseparable.

More than half of Ethiopia's highland areas are affected by severe land degradation. Soil erosion, deforestation, and declining agricultural productivity are the daily reality for millions of smallholder farmers whose livelihoods depend on land that is losing its capacity to produce. In a country where agriculture accounts for most rural employment, degraded land is a direct threat to food security, climate resilience, and economic stability.

At the same time, land tenure insecurity has long limited farmers' willingness to invest in the land they till. Without formal recognition of their rights, they have little incentive to build terraces, plant trees, or adopt conservation practices whose benefits accrue over years and decades.

CALM was designed to fix this. Using a Program-for-Results (PforR) financing instrument, which only disburses funds upon verified delivery of results, the program incentivized national ownership, strengthened land and watershed management systems, and linked financing to outcomes across 700 woredas (local subdivisions equivalent to districts).

By September 2025, the results exceeded expectations on nearly every dimension.

Landscape restoration at scale. Over 2.56 million hectares have been brought under sustainable landscape management practices, including area closure, climate smart agriculture, and soil and water conservation. Approximately 3.5 million hectares are now registered under more than 6,000 legally estab-

lished Community Watershed User Cooperative Societies (CWUCSs), community-governed institutions that give farmers a formal stake in the management of shared landscapes.

Land tenure secured for millions. The program issued over 8.8 million Second Level Landholding Certificates to more than 3.9 million households, securing rights over 16 million hectares of land. Over 495 woredas have been fully digitized in the National Rural Land Administration Information System, creating permanent digital records instead of paper titles vulnerable to fire and deterioration. Eighty-one percent of registered landholdings are now owned by women, either individually or jointly, a figure that reflects a deliberate and consequential shift in who holds formal rights to land in rural Ethiopia.

Livelihoods and financial inclusion. CALM generated over 1.1 million jobs across eight pathways, with women accounting for 27% and youth for 8% of total employment. Thanks to formal ownership of their land, certified landholders could access a cumulated $65 million in loans from microfinance institutions. In total, the program reached over 11.5 million beneficiaries, of whom 50% are women.

The most important lesson from CALM is also the simplest: when farmers have legal rights to their land, they invest in it. By combining land certification with community watershed governance through CWUCSs, CALM gave farmers both the legal standing to protect their land and the institutional structure to manage shared resources collectively.

The PforR instrument reinforced this logic at the national level. By only disbursing upon verified results, it required the Ethiopian government to build data systems, hire data managers and trained surveyors, and set up the verification capacities and institutional processes needed to demonstrate what was happening in 700 woredas. Those investments will outlast any single program cycle.

With 81% of landholding certificates issued to women, either individually or jointly, CALM's gender outcomes are among its most consequential, changing the very structure of economic power in rural households. Women with formal land rights are more active participants in credit markets, more likely to invest in conservation, and more active as decision-makers in household financial planning. The 496,000 jobs held by women across CALM's

five employment pathways deepen that shift, creating income streams that are directly tied to the restoration of the landscapes that women now formally own.

In April 2026, the World Bank approved CALM 2, increasing the total funding to $1,025.65 million, including $200 million from IDA, $17 million from the Scaling Climate Action by Lowering Emissions (SCALE) Fund, 10 million EUR from the Nordic Development Fund, and $11.5 million from the Climate Investment Funds, Nature, People, and Climate Program (NPC).

The goal of this new phase is to make sure that the project's benefits are sustained and further developed for the millions of smallholder farmers and forest-dependent communities across Ethiopia's highlands who stand to benefit from secure land tenure, productive watersheds, and strong market linkages. IFC will work to attract private capital and reduce dependence on public and donor financing, emphasizing the development of business models that directly involve smallholder farmers and local communities and ensuring their active participation in and benefit from these initiatives.

As Africa confronts accelerating climate pressures and growing rural populations, the strategic integration of land tenure, landscape restoration, and digital infrastructure will be one of the defining governance challenges of this decade. Thanks to CALM, Ethiopia's highlands, once among Africa's most degraded, are showing what is possible when farmers own their land, manage it together, and invest in its future.

News Source

https://www.worldbank.org/en/news/feature/2026/06/15/from-degraded-hillsides-to-productive-land-ethiopia-s-landscape-management-program

Redefining Soil Health and Food Security Through Tropical Conservation Agriculture

Abstract

Conservation agriculture (CA) is a leading strategy for promoting soil health, food production, and ecological sustainability. Yet, food security in the tropics remains elusive, constrained by persistent soil degradation. This systematic review of 474 studies evaluates the state, gaps, and prospects of CA and soil health research across the tropics. Brazil accounted for 40% of the research output, driven by strong institutional support and public investment. Only 17% of studies integrated chemical, physical, and biological soil health indicators, and even fewer applied structured soil health indices. Most research focused on the top 0–20 cm of Oxisols, Alfisols, and Ultisols, limiting the evidence of CA for long-term sustainability. CA systems were dominated by maize and soybean, with low inclusion of root and tuber crops essential for tropical food security. Scaling the Brazilian CA model through South -South cooperation offers a pathway to more resilient and equitable food systems in the tropics.

Results

There is a strong emphasis on chemical and physical soil properties used as soil health indicators within the tropics. Out of the total, 73% studies quantified the impact of CA on at least one soil chemical property (e.g., pH, and/or EC, and or plant nutrients), and 66% measured soil physical properties, while only 33% of the studies measured biological soil health indicators. Only 17% of studies integrated all three indicators, and 11 papers assessed the soil health index. Physical and chemical properties were assessed since the 1990s, while biological indicators became increasingly important after the year 2000. Soil organic carbon was the most measured parameter across all studies. Other frequently assessed chemical indicators included nitrogen, phosphorus, potassium, and pH, while bulk density and soil moisture were the most reported physical indicators. Biological measurements were comparatively limited, with microbial biomass and respiration being the most measured metrics.

Inherent soil properties strongly influenced the impact of CA. The majority of studies were conducted on Oxisols (36.5%), Alfisols (26.8%), and Ultisols (18.2%), with the remaining 18.5% focused on Entisols, Inceptisols,

Vertisols, Mollisols, Andisols, and Histosols. The reviewed studies cover all United States Department of Agriculture soil textural classes, as presented in the soil textural triangle. The most studied textures were clay (31.9%), sandy loam (20.5%), and sandy clay loam (19.6%). Soil sampling primarily focused on the top 0–20 cm layer (58.4%), and 89.6% evaluated to soil depth of 0-50 cm. Only 2.6% of studies assessed depths beyond 100 cm.

This study analyzed the distribution of crop components integrated into CA systems across tropical regions. Pastures and cover crops were the most represented category, accounting for 40.1%. Cereals constituted 23.3% of the crop group, with the predominance of Zea mays (maize). Legume crops constituted 19.9%, dominated by soybean (51.3%) and Vigna spp. (23.5%). Trees were included in 5.7% of studies, primarily Acacia spp. and Cocos nucifera. Fruits and vegetables accounted for 4.9%, with Musa spp. been the most common. Oil crops (2.5%), root and tuber crops (2.5%), and sugar crops (0.7%) were the least represented. Most of the research management practice was conducted under mechanized compared to manual farming practices. There was higher assessment of soil health under zero and conventional tillage, and predominantly associated with mechanized systems.

The distribution of CA research across tropical countries is misaligned with the severity of food insecurity. Most countries with high Global Hunger Index (GHI) scores, particularly in sub-Saharan Africa, had low CA research output. Whereas Brazil, which contributed the highest research output, had a low hunger score despite the high population, while other highly populated countries, such as Nigeria, Indonesia, and India, face higher hunger burdens.

Discussion

Despite growing interest in soil health, few studies have assessed chemical, physical, and biological soil health indicators in response to CA (in the same study), and even fewer have applied structured frameworks to index soil health. This highlights a gap in the comprehensive assessment of CA effects on the multifaceted soil functions. In temperate regions, particularly in the United States of America (USA), frameworks such as the Soil Management Assessment Framework (SMAF) and the Comprehensive Assessment of Soil Health (CASH) have been successfully applied to

monitor soil health response to land use and management, allowing a holistic soil health assessment in response to agricultural practices. More recently, the Soil Health Assessment Protocol and Evaluation (SHAPE) framework, which also incorporates inherent soil properties and weather variables, has been developed but remains unexplored in tropical regions. Adapting and implementing such integrated soil health indices is crucial to advancing holistic evaluations and supporting tropical-specific agricultural management strategies.

Developing an effective site-specific soil health assessment framework for the tropics is challenging, but possible. A major constraint to developing soil health assessment frameworks or decision-support tools in the tropics is the limited availability of harmonized datasets that adequately capture the high heterogeneity of tropical soils and agroecological conditions. Many legacy soil datasets are not properly georeferenced, limiting their usefulness for spatial assessments and model development, while the measurement of soil health indicators is often time-consuming and costly, resulting in fragmented datasets. Addressing these challenges will require expanding soil monitoring networks, improving access to soil information systems, harmonizing soil analytical protocols, and leveraging digital soil assessment approaches. The development of frameworks such as SHAPE will depend on large, well-distributed soil datasets that capture the inherent heterogeneity of edaphic, climatic, and production system attributes. These datasets can be integrated with emerging digital soil databases and remote sensing products to support the development of robust, data-driven soil health indices tailored to tropical environments.

News Source

https://www.nature.com/articles/s44458-026-00086-y

25-year, Quarterly Land Change Maps of China's Loess Plateau Reveal Long-term and Substantial Water-induced Soil Erosion Mitigation

Abstract

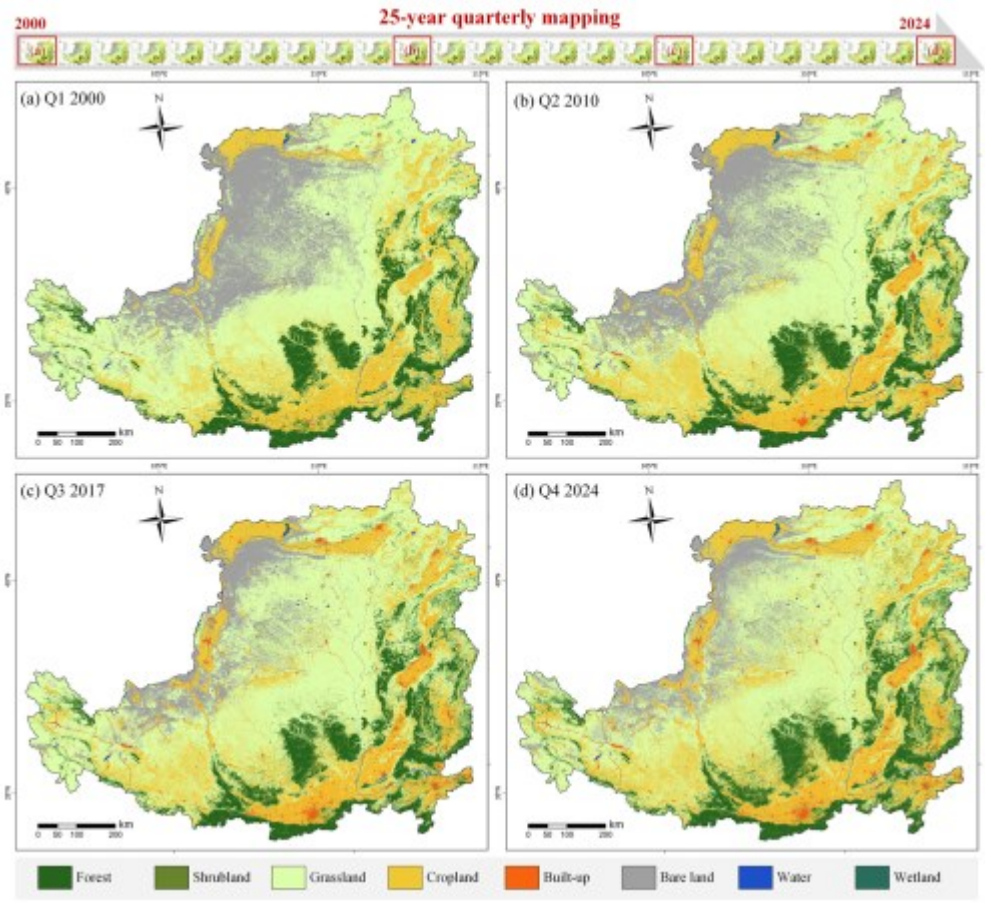
Unsustainable human activities have driven global ecological degradation. In China, decades of restoration policies have been implemented to reverse this trend in severely degraded regions with catastrophic soil erosion, transforming them into landscapes of ecological recovery. However, the evolution of soil erosion in these regions remains poorly quantified due to the absence of high-resolution, long-term, and high-frequency monitoring data. Here, to address this gap and provide a reliable spatiotemporal benchmark dataset, we conducted the first 10–30 m quarterly wall-to-wall land change mapping for China's flagship ecological restoration site: the Loess Plateau, based on the developed cross-temporal consistency-constraint deep learning framework. The dataset was generated using over 10 TB of Sentinel and Landsat imagery and documents land-cover dynamics across 100 quarterly time steps from 2000 to 2024, showing an overall accuracy of 81.44 % based on 40 000 annotated samples and 79.8 % for third-party validation sources. The resulting maps record pronounced land-cover dynamics, including forest expansion (+13 131 km2), cropland expansion (+28 095 km2), and bare land reduction (−65 029 km2) over the past decades. Furthermore, the produced dataset was combined with environmental factors to measure the 25-year water-induced soil erosion, where comparison with government survey data shows strong consistency, with a mean absolute error of 4.50 %. The dataset further illustrates that long-term ecological interventions have substantially reduced erosion intensity in the region by 30 % over the past 25 years, from 13.34 to 9.35 t (hm2 a)−1. Based on this benchmark, the long-term, fine-grained soil erosion becomes possible to estimate. The data-driven analysis indicates that current erosion is most severe in the central and southwestern Loess Plateau, and scenario modeling based on multiple factors suggests that optimized vegetation distribution – including grassland expansion and cropland-to-forest conversion – could potentially reduce future erosion intensity to 6.42 t (hm2 a)−1. This dataset provides a comprehensive benchmark for erosion mitigation in the Loess Plateau and its underlying drivers, providing critical insights for sustainable land management, ecological restoration, and policy develop-

ment both in China and across fragile ecosystems worldwide. The land-cover maps and soil erosion maps are available at https://doi.org/10.57760/sciencedb.33656 (Cheng et al., 2026).

Results

25-year quarterly land-cover maps of China's Loess Plateau

In this study, we present a land-cover dataset for the Loess Plateau covering 2000–2024 with a three-month temporal resolution, referred to as LP-QLC10. Specifically, the dataset comprises 100 temporal phases and was produced at a spatial resolution of 30 m for 2000–2015 and 10 m for 2016–2024, reflecting the native characteristics of the underlying satellite sensors. Furthermore, to provide an overview of its temporal patterns and classification scheme, a subset of the quarterly maps is illustrated in Fig. 5. Spatially, forest is mainly distributed in the southern and eastern portions of the Loess Plateau, whereas grassland dominates the central and western regions. Cropland occurs largely along the regional margins and is typically situated near water



bodies and built-up areas. In contrast, the northwestern Loess Plateau is characterized by extensive bare land interspersed with patches of grassland. Temporally, bare land has exhibited a pronounced decline over the past 25 years, while cropland and built-up areas have expanded, particularly in the southern and eastern regions. These trends reflect intensified land use and increasing human activities. In addition, the LP-QLC10 dataset developed under the CCTS framework significantly outperforms the baseline model in terms of both spatial accuracy and temporal continuity. Quantitatively, this advantage leads to an average overall accuracy (OA) improvement of 2.88 %. Qualitatively, it demonstrates enhanced multi-temporal mapping stability for land-cover types, such as grassland, cropland, and forest.

Quantitative validation with multiple independent sources

The table reports the results for 40 000 manual annotations developed in this study, obtained by labeling 8000 validation points at five-year intervals. Overall, LP-QLC10 consistently outperformed the comparison products across all three metrics. Specifically, its average OA (0.8144), Kappa (0.7258), and FWIoU (0.6454) were all substantially higher than those of CLCDs, GLC_FCS30D, and YRCC_LPLC, with LP-QLC10 ranking first in most evaluated years and showing particularly strong performance from 2001 to 2016. Although Esri_GLC10 surpassed LP-QLC10 in FWIoU

Datasets	Metrics	2001	2006	2011	2016	2021	Average
CLCDs		0.737	**0.791**	0.759	0.790	0.781	0.7716
GLC_FCS30D		0.753	0.743	0.757	0.749	0.742	0.7488
YRCC_LPLC	OA	0.707	0.752	0.757	0.791	0.784	0.7582
Esri_GLC10		–	–	–	–	0.744	–
LP-QLC10 (ours)		**0.785**	0.787	**0.800**	**0.855**	**0.845**	**0.8144**
CLCDs		0.610	0.668	0.651	0.685	0.669	0.6566
GLC_FCS30D		0.648	0.621	0.663	0.645	0.633	0.6420
YRCC_LPLC	Kappa	0.583	0.625	0.654	0.694	0.682	0.6476
Esri_GLC10		–	–	–	–	0.611	–
LP-QLC10 (ours)		**0.686**	**0.673**	**0.715**	**0.783**	**0.772**	**0.7258**
CLCDs		0.523	0.609	0.566	0.589	0.594	0.5762
GLC_FCS30D		0.556	0.548	0.555	0.556	0.570	0.5570
YRCC_LPLC	FWIoU	0.512	0.570	0.564	0.600	0.604	0.5700
Esri_GLC10		–	–	–	–	**0.739**	–
LP-QLC10 (ours)		**0.663**	**0.643**	**0.582**	**0.647**	0.692	**0.6454**

for 2021, its applicability to long-term research is limited because the Esri product covers only the period 2017–2024. Besides, the transition of LP-QLC10 from 30 m imagery to 10 m imagery after 2016 resulted in a substantial improvement across all three metrics, highlighting the importance of higher spatial detail for accurately distinguishing fine-scale land-cover patterns in the Loess Plateau. Taken together, the long-term validation illustrates that LP-QLC10 provides both high classification accuracy and strong temporal stability.

Article Source

https://essd.copernicus.org/articles/18/3303/2026/

Contents of Issue 3, 2026 for IJSR

https://www.sciencedirect.com/science/article/pii/S100162792500126X

Sensitivity and complexity of the Yangtze River's sediment dynamics

Boyan Li, Sen Chen, Pengwen Zhang, Ken Luo, ... Yunchen Wang

Pages 422-431

https://www.sciencedirect.com/science/article/pii/S1001627925001283

Effects of grain arrangement and grain size on gravel-bed microtopographies

Yunwen Pan, Xin Liu, Kejun Yang

Pages 432-449

https://www.sciencedirect.com/science/article/pii/S1001627926000107

The transport mechanisms of sediment and phosphorus in agricultural drainage ditches in the presence of vegetation

Xuanye Liu, Minghong Chen, Zailin Huo

Pages 450-462

https://www.sciencedirect.com/science/article/pii/S1001627926000119

Sedimentological and diagenetic controls on burrow fillings in the upper Jurassic Hanifa formation, central Saudi Arabia: Implications for porosity and pore system variations in bioturbated reservoirs

Ahmed Refaat, Hassan A. Eltom, Ammar El-Husseiny, John D. Humphrey, Moaz Salih

Pages 463-480

https://www.sciencedirect.com/science/article/pii/S1001627925001222

Quantifying the effects of root, soil properties and hydraulic characteristics on soil detachment of naturally restored grassland on the Loess Plateau

Junyang Liu, Zhengchao Zhou, Weixiao Han, Yanan Yang

Pages 481-492

https://www.sciencedirect.com/science/article/pii/S1001627925001301

Flocculation characteristics and mechanisms of suspended sediment under ultrasonic–electric coupling intervention

Wenwen Bai, Miao Wu, Jiahua Wei, Yifeng Liu, ... Shengchun Wang

Pages 493-504

https://www.sciencedirect.com/science/article/pii/S1001627926000016

Quantifying rill erosion processes in evolving soil landscapes: An experimental approach

Yanmin Jiang, Haijing Shi, Xihua Yang, Minghang Guo, ... Ye Wang

Pages 505-521

https://www.sciencedirect.com/science/article/pii/S1001627926000120

Hydrosedimentary dynamics and sediment source activation during a prolonged extreme rainfall event in a Mediterranean catchment

Julián García-Comendador, Juan R. Bustos-Caparrós, Francisco Cuello-Llobell, Josep Fortesa, ... Joan Estrany

Pages 522-533

https://www.sciencedirect.com/science/article/pii/S1001627926000144

WASWAC Councilors

Abdulvahed Khaledi Darvishan
Alfred Hartemink
Annie Melinda Paz-Alberto
Arora Sanjay
Baoyuan Liu
Bořivoj Šarapatka
Carmelo Dazzi
Chinapatana Sukvibool
Clemencia Licona Manzur
Dennis C. Flanagan
Duihu Ning
Eli Pavlova-Traykova
Fei Wang
Fenli Zheng
Goran Skataric
Ian Hannam
Ivan Blinkov
Ivan Minchev
Jorge A. Delgado
José Alfonso Gomez
Laura Bertha Reyes Sanchez
Lillian Øygarden
Mahmoud A. Abdelfattah
Mark Nearing
Michael Maerker
Moshood Tijani
Nigussie Haregeweyn Ayehu
Nikola Živanović
Panos Panagos
Paola Andrea Campitelli
Paulo Tarso S. Oliveira
Qin Chen
Qingbin Pan
Rachid Mrabet
Sergey Chalov
Sevilay Haciyakupoglu
Seyed Hamidreza Sadeghi
Shabbir Ahmad Shahid
Shachi Pandey
Stefanos Stefanidis
Thomas W. Goddard
Tijana Vulević
Tolga Görüm
Valentin Golosov
Velibor Spalevic
Wanwisa.Pansak
Xiubin He
Zachary Gichuru Mainuri

WASWAC Advisors

Chihua Huang
Coen Ritsema
Des E. Walling
Dingqiang Li
Donald C.Reicosky
Faouzi Bekkaoui
Franco Obando-Moncayo
Gustavo Henrique Merten
Hans Hurni
Illdefonso Pla Sentis
James Owino
Jean Poesen
Kingshuk Roy
Machito Mihara
Mike Fullen
Miroslav Dumbrovsky
Peter Strauss
Rattan Lal
Roberto A. Peiretti
Rosa M. Poch
Surinder Singh Kukal
Syaiful Anwar
Ted L. Napier
William Critchley
Xiaoying Liu

WASWAC Honor Presidents

Jose Luis Rubio
Miodrag Zlatic
Rui Li

(Names are arranged in alphabetical order)

WASWAC

The Secretariat of WASWAC
No.20 Chegongzhuang Road West
Beijing 100048 P.R.China
Website: www.waswac.org.cn
Tel.: +86 10 6878 6579
Fax.: +86 10 6841 1174
Email: waswac@foxmail.com
waswac@vip.163.com