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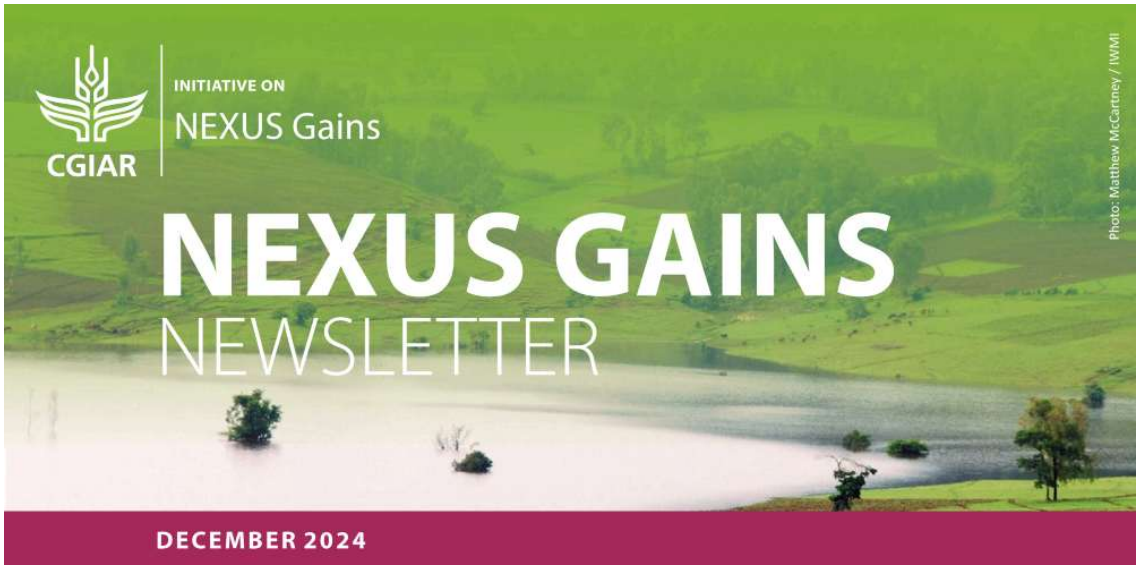


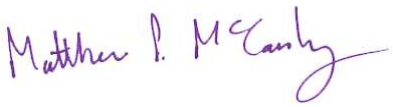
Dear colleagues, partners, and friends,

As we conclude three years of impactful work under the NEXUS Gains initiative, we reflect on the significant progress made in advancing the integration of water, energy, food, and environmental (WEFE) systems. Through collaboration with local communities, governments, NGOs, private sector, and academia, we have demonstrated how integrated solutions can enhance resilience, promote sustainability, and address some of the most pressing environmental challenges.

Over the past three years, recognition of the need for nexus solutions has grown significantly, with key milestones for NEXUS Gains including discussions at three interlinked COPs: biodiversity, climate change, and desertification, and support to the recent IPBES nexus assessment. There has been a growing consensus that sustainable solutions to complex global challenges can only be achieved through coordinated action across sectors and scales. Nexus thinking is gaining momentum among development organizations and governments, who are increasingly recognizing that siloed approaches are inadequate for addressing the interconnected nature of real-world challenges.

Looking ahead, we are excited to announce the transition to *Nexus Policy Gains* within the broader CGIAR Policy Innovation Science Program, starting in January 2025. This next phase will focus on translating the research from NEXUS Gains into actionable policies, ensuring that integrated solutions become central to sustainable development and resource management strategies at local, national, and global levels.

As we wrap up this year, we wish you a peaceful and relaxing holiday season. We look forward to continuing our work together in the coming year, advancing the nexus agenda for a sustainable future!



Matthew McCartney – NEXUS Gains Initiative Lead

Claudia Ringler – NEXUS Gains Initiative Co-lead

NEXUS highlights

Technical support to Nepal's delegation at UNFCCC COP29

IWMI Nepal, through NEXUS Gains, provided significant support to the Government of Nepal at this year's climate change COP. This collaboration began prior to the conference when IWMI organized training on negotiations focused on linkages between climate change and water with government and non-state actors. Five officials who participated in the training then attended COP29 with two NEXUS Gains policy experts joining the delegation in Baku. Manohara Khadka took the stage at the Water for Climate Pavilion in two side events co-organized by IWMI, sharing NEXUS Gains' engagement in preparing the third Nationally Determined Contribution (NDC 3.0) of Nepal with water-specific targets and indicators. Santosh Nepal followed the negotiations on climate adaptation and the global goal for adaptation, and participated in side events to highlight Nepal's efforts at balancing mitigation and adaptation in NDC 3.0. IWMI Director General Mark Smith also spoke at the Government of Nepal's high-level side event on "Mountains in Peril".

Sharing nexus solutions at UNCCD COP16

NEXUS Gains participated in several sessions at the United Nations Convention to Combat Desertification (UNCCD) COP16 under the theme "Our Land. Our Future." This included a video display on "Transforming landscapes and livelihoods of tribal communities in the Ganga basin" by ICRISAT (see the first blog in 'News and views') which presented CGIAR and partners' solutions for managing water scarcity in groundwater depleted drylands; as well as a session on "Tackling Water Scarcity and Drought: Sustainable Solutions for Food Systems and Ecosystem Health in a Climate-Constrained World."

IPBES releases nexus report tackling intertwined triple planetary crises

The IPBES Nexus Assessment on Biodiversity, Water, Food, Health, and Climate was officially approved by 147 countries on 16 December 2024. This milestone marks the culmination of efforts to which NEXUS Gains, and before it the CGIAR Research Program on Water, Land and Ecosystems (WLE), have contributed substantially since 2019. The assessment includes more than 70 integrated cross-sectoral solutions available to policy makers to address major global challenges of biodiversity loss, ecosystem degradation,

and public health. They include halting the conversion of remaining intact ecosystems; managing ecosystem functions in agricultural landscapes; reducing nutrient, plastic, and pesticide pollution; and shifting to sustainable healthy diets. The authors stress the need to move beyond simply describing challenges to actively implementing solutions at a pace and scale that match the magnitude and severity of the multiple crises we are currently facing.

Pakistan Water Week addresses country's water crises

Climate change, water shortages, and food security were front and center at the fourth Pakistan Water Week. Held in Islamabad on 4–8 November with the support of NEXUS Gains, the conference brought together 43 international and over 300 national participants to explore the theme of "Building a Climate-Resilient Future: Pathways for Food, Water, and Food Security in Pakistan". Discussions included improved water accounting, community-focused disaster strategies, and enhanced flood early warning systems. Speaking at the event, Dr Mohsin Hafeez, NEXUS Gains lead for the Indus Basin and work package 1, reminded attendees that "water security is vital for Pakistan's future."

Pakistan's first eddy covariance flux tower installed in Punjab

NEXUS Gains research in Pakistan is set for a boost with the installation of the country's first eddy covariance flux tower. Erected by IWMI at Khwaja Fareed University of Engineering and Information Technology in southern Punjab, the tower will collect data on water use, energy fluxes, and carbon emissions from irrigated agricultural landscapes. "The eddy covariance flux towers are more than just instruments; they are enablers of informed decision-making for sustainable agriculture and water security in Pakistan," said Dr Mohsin Hafeez, NEXUS Gains lead for the Indus Basin, at the tower's inauguration. "The data generated will be instrumental in shaping policies to address water scarcity and climate adaptation." IWMI Pakistan has installed an additional three flux towers in irrigated landscape areas of Punjab.

Workshops showcase tools to transform water management in India

On 18 November, a workshop in New Delhi provided hands-on training for the Water Productivity Atlas. The tool was developed to provide a one-stop shop for visualizing the water productivity and water footprints of different crops, cropping patterns, and agricultural systems. Attending the workshop, Ms Debashree Mukherjee, Secretary of the Department of Water Resources, River Development, and Ganga Rejuvenation, acknowledged that "reliable data and innovative tools like IWMI's Water Productivity Atlas will redefine water management in agriculture, helping us address water scarcity and achieve sustainability goals." On 25 November, a workshop on integrated storage assessment was held in Hyderabad. Experts from key institutions across the country joined technical sessions showcasing tools like Google Earth Engine and the TRACE (next generation monitoring of surface water from space) concept and their application in real-time water resource monitoring and decision-making.

Data from two decades of soil health in Uganda

Soil degradation is a key problem in Uganda, where NEXUS Gains, IFPRI, and Uganda's National Agricultural Research Organization have initiated a new round of a gender-disaggregated soil health survey. Building on data collected in 2003 and 2013, the new round completes a 20-year perspective on changes in soil health and decision-making at the plot level. This time, new information has also been collected on women's agency and land rights – topics that were under discussion at UNCCD COP16 and are integrated in the Africa Fertilizer and Soil Health Action Plan.

Delivering nexus solutions for nutrition

The Delivering for Nutrition conference, held in Colombo, Sri Lanka on 3–5 December, brought together leading researchers and policymakers to explore critical food systems challenges in South Asia. NEXUS Gains researchers presented innovative insights on nutrition, agriculture, and energy across the region. Vartika Singh's research showed that food systems generate USD 1.17 trillion in hidden costs, with malnutrition significantly impacting India's disease burden. Simulated dietary interventions showed potential to improve diets and save 20 million life-years that would otherwise be lost. Muzna Alvi's research highlighted gender disparities in rural energy access, demonstrating how women's energy empowerment correlates with clean cooking and dietary diversity. Tushar Singh's study explored the complex relationship between farm production diversity and dietary outcomes across different Nepalese regions, emphasizing the need for context-specific agricultural policies.

Support to the Ramsar Centre for Eastern Africa (RAMCEA)

NEXUS Gains, in collaboration with the CGIAR's National Policies and Strategies Initiative, provided technical backstopping and supported wetland managers from South Sudan to participate in a 'Ramsar Wetlands Twinning' visit to Uganda on 7–12 December. This event helped foster cooperation and facilitated policy dialogue and institutional learning between the two countries.

Learning resources for WEFE nexus capacity development

Water, energy, food, and the ecosystems that provide and sustain these are intrinsically linked. The WEFE nexus approach therefore provides an avenue for the integrated management of related resources and their coordinated governance across sectors and scales. Yet practical implementation of the approach requires capacities that are often lacking in the traditionally siloed WEFE sectors. NEXUS Gains has developed a suite of learning resources to support capacity development in this area. The materials are tailored to the needs of a wide range of actors – researchers, students, practitioners, decision-makers, and policymakers – working in WEFE sectors. The contents focus on the technical as well as social considerations of managing the WEFE nexus, from modeling to equity and inclusion.

Gender matters

Women defining water, energy, food, and ecosystems leadership in Nepal

Since its launch in June 2023, the WEFE Nexus Leadership Program has had positive, long-lasting impacts for its participants. Inspired by NEXUS Gains research into the challenges facing women working in Nepal's water, energy, food, and ecosystems (WEFE) sectors, the program was created to strengthen the leadership and negotiation skills of women professionals, enabling them to better identify and address the structural barriers to gender equality and social inclusion in Nepal's WEFE sectors. The inaugural cohort, which graduated in December 2023, recently reconnected to discuss their experiences. "We have noticed their networks have been strengthened, because they have become friends and know each other more, inviting each other to events in their organizations," observed Dr Sanju Koirala, a National Researcher at IWMI Nepal who helped run the course.

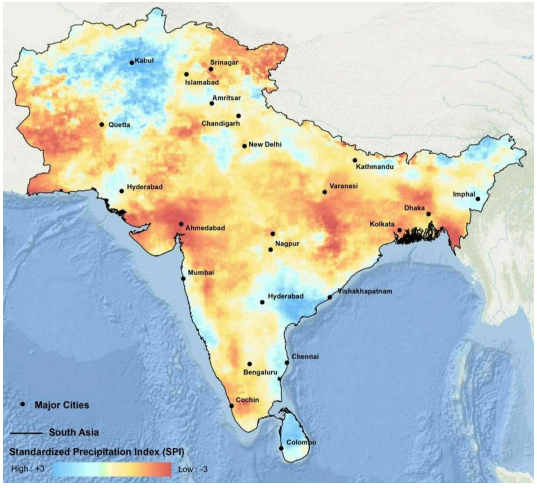
News and views

Integrated land and water planning reverses migration of tribal communities in the Ganga Basin

In the Indian village of Poora Birdha, recurrent droughts led to widespread migration of tribal farmers. The International Crops Research Institute for the Semi-Arid Tropics partnered with the Government of Uttar Pradesh to rejuvenate the landscape and later included NEXUS Gains to incorporate climate resilience strategies. These integrated land and water planning approaches have increased water levels in hand-dug wells, which in turn has led to the return of farmers who had moved to cities when water was scarce.

New platform supports integrated drought management in Africa and South Asia

Knowledge and outputs from IWMI's two decades of research into monitoring and managing droughts are now available on a single platform. The new IWMI Drought Monitor, developed with support from NEXUS Gains, shares comprehensive information from IWMI's implementation of drought management innovations. As climate change progresses, the IWMI Drought Monitor will help policymakers and practitioners address drought in vulnerable nations.



Advancing integrated water storage to support the water–energy– food–ecosystems nexus in the Blue Nile Basin, Ethiopia

On 29–30 October 2024, a workshop was held in Hawassa, Ethiopia, to progress integrated storage solutions for the important but seasonally variable upper Blue Nile basin. Led by IWMI, under NEXUS Gains, the workshop brought together over 40 stakeholders, including the Ministry of Water and Energy, the Abay Basin Administration Office, and the Environmental Protection Authority, to explore cross-sectoral initiatives to improve water storage.

Crafting combinations to govern groundwater: Knowledge, motivation, and agency

NEXUS Gains dedicated its November webinar to the vital but challenging practice of groundwater governance. Sharing the latest research on the subject, it encouraged attendees to tackle groundwater problems in new ways. “Instead of starting with tools, start by identifying the key actors,” urged Ruth Meinzen-Dick, a researcher at IFPRI. “Then consider what they need in terms of knowledge, motivation, and agency.”

A Community of Practice for water modeling in Nepal

In November 2023, IWMI worked with partners to establish a Community of Practice for water modeling in Nepal – achieving an important goal for NEXUS Gains. Over the past year, the 25-member strong Community of Practice has supported cross-sectoral collaboration and strengthened skills to effectively use integrated modeling tools. Learn more about the Community of Practice’s aims and accomplishments in a new blog.

More news from NEXUS Gains

Get involved!

Missed any of our NEXUS Gains Talks seminars this year? You can still watch the recordings or catch up by listening to our podcast series!

Applications open for Collaborative Learning School in Nigeria

Early career researchers from Africa and the US, with research directly related to WEF nexus themes, are invited to apply for the 2025 SustainFood Collaborative Learning School, a group receiving back-stopping from NEXUS Gains. To be held over two weeks in May 2025, the school will connect participants with farmers, policymakers, and other stakeholders at the community level to assess food security challenges and identify innovative solutions using the WEF nexus framework. The deadline for applications is 12 January 2025.

Further reading

Blogs

- Business and finance models for increased sustainability and equity of solar-powered irrigation in Pakistan: Insights from the private sector
- Combining an array of approaches for systemic behavior change in groundwater governance in India
- Continuous efforts to educate decision-makers at all levels on the nexus in Nepal
- Integrating the Nationally Determined Contributions (NDCs) and National Biodiversity Strategies and Action Plans (NBSAPs) through the water, energy, food and ecosystems (WEFE) nexus approach
- Nepal's women leaders champion inclusive development
- Stakeholders converge on integrated water storage in the Shashe Catchment
- Sustaining India's invisible resource – groundwater – through participatory management

Papers, reports, and briefs

- A just world on a safe planet: A Lancet Planetary Health–Earth Commission report on Earth-System boundaries, translations, and transformations
- Aligning local governance with SDGs: a study of local government systems in Pakistan
- An inter-institutional working group connects water, energy, food, and ecosystems policymaking in Ethiopia
- Applying WEFE nexus approaches for synergistically advancing the implementation of national biodiversity and climate commitments under the UNCBD and UNFCCC
- CGIAR Initiative on NEXUS Gains at the 9th Asian Regional Conference on Irrigation and Drainage
- Economics of sustainable irrigation in smallholder agriculture: Implications for food security and climate action

- Expert feedback on weights survey results in the Decision Support Tool framework for Optimizing the Water-Energy-Food-Ecosystem Nexus within the Aral Sea Basin
- Groundwater games in Barahathawa: Lessons and implications
- How to reduce agrifood systems' future hidden costs? A multicountry case study
- Impact of climate change on cost and cost efficiency of solar irrigation in Sub-Saharan Africa
- India – in "How to reduce agrifood systems' future hidden costs? A multi-country case study"
- Integrating groundwater recharge solutions across the Ramganga Basin, India: a rural-urban approach
- Roundtable discussion on gender and social inclusion in the energy sector: research findings and stakeholder perspectives
- State of Food and Agriculture (SOFA) 2024: Background report
- Synthesis of the agrifood systems' hidden costs analysis in the six FABLE country case studies

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