



INITIATIVE ON  
NEXUS Gains

# NEXUS Gains

Realizing multiple benefits across  
water, energy, food, and  
ecosystems

**Update for the CGIAR System Council**

24 May 2023

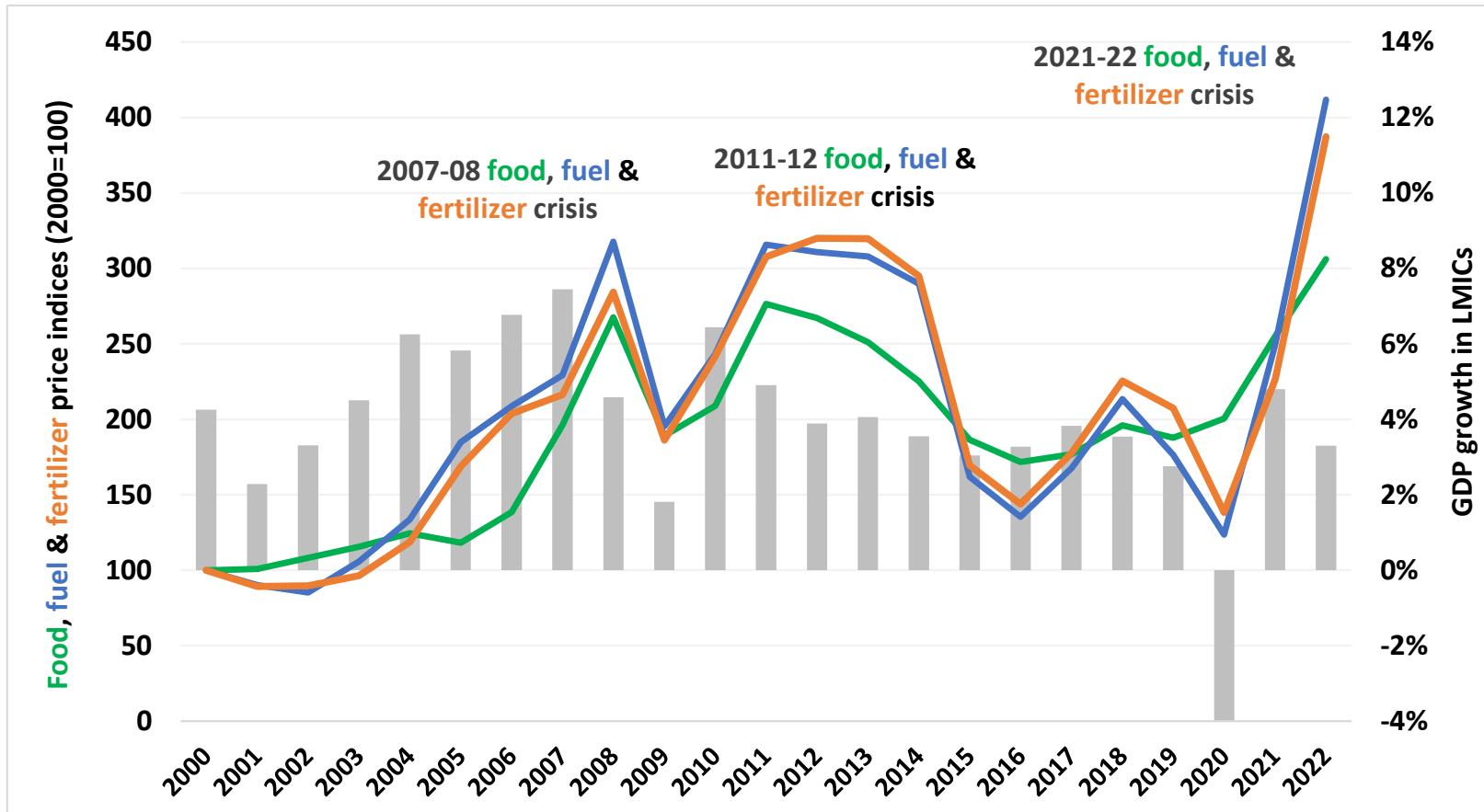
Matthew McCartney (Lead), Claudia Ringler (Co-Lead & WP3),  
Mohsin Hafeez (WP1), Jonathan Lautze (WP2),  
Ruth Meinzen-Dick (WP4), and Marlene Elias (WP5)



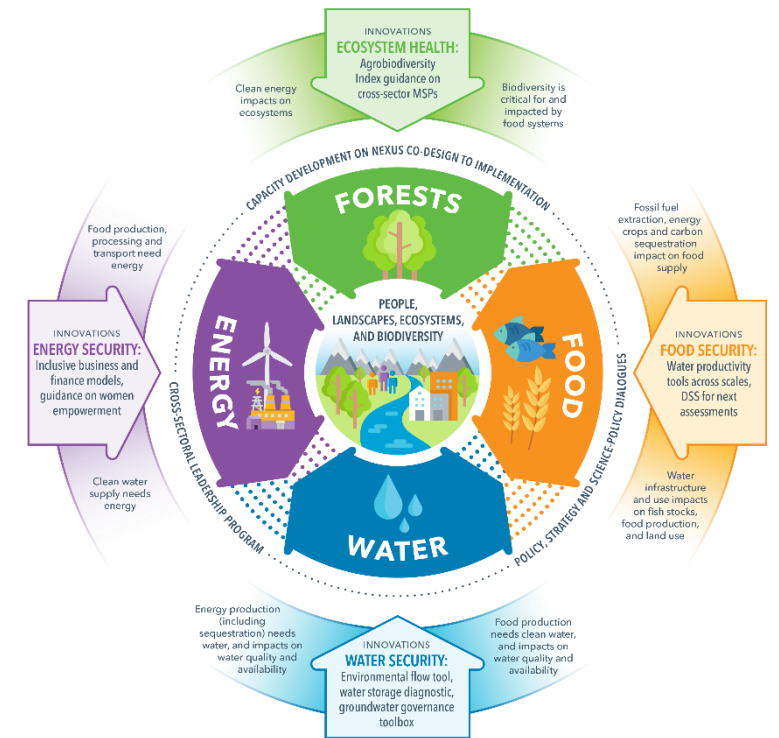
# Water–Energy–Food–Environment (WEFE) nexus challenges in a climate crisis



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Source: [Headey and Hirvonen \(2022\)](#) using data from FAO, the World Bank and the IMF



# Overview

## End of Initiative (EOI) outcomes

1. Demand partners assess Water–Energy–Food–Environment (WEFE) **tradeoffs and synergies to prioritize WEFE innovations**
2. Demand partners assess **integrated water productivity and storage options** to improve system-level water security
2. Private investors and policymakers, cognizant of systems linkages and gendered benefits, accelerate **equitable access to rural clean energy**
3. Policymakers and stakeholders identify ways to improve **governance across WEFE systems**
5. Government, business, NGO, and CSO professionals in WEFE sectors use **new capacities** to co-develop sustainable and equitable WEFE approaches



**Focus Basins:** Limpopo/Incomati, Blue Nile, Aral Sea, Indus and Ganges

**Target countries:** Ethiopia; India; Nepal; Pakistan; South Africa; Sudan; Uzbekistan; Zimbabwe

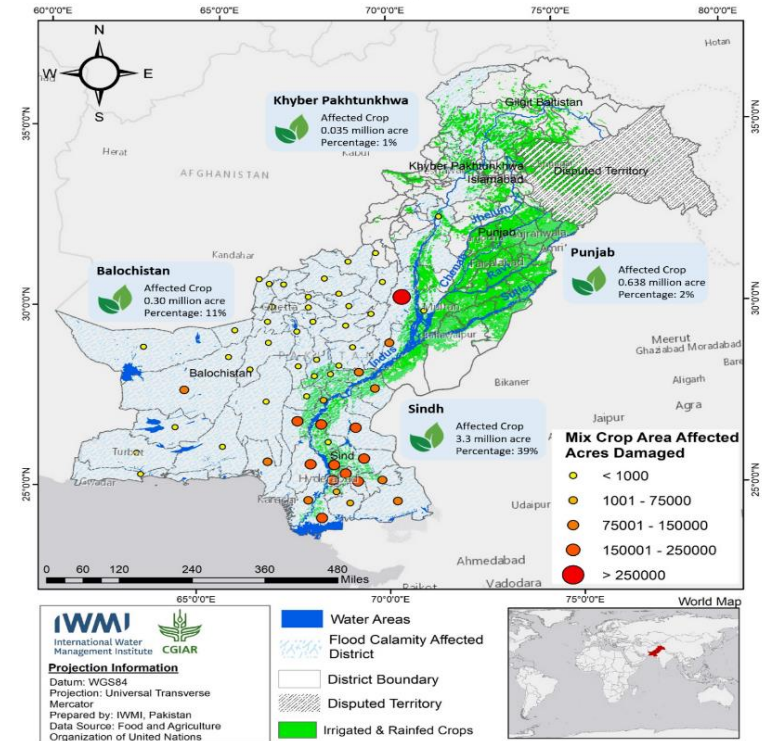
# EOI: Tradeoffs and synergies



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## Pakistan – floods

- Direct support to the government on flood extent, crop, and irrigation infrastructure damage
- Support to Ministry of Finance, Punjab to target emergency relief based on size of loss; method now adopted by Punjab Disaster Management Authority
- Contribution to breakthrough agreement on “Loss and Damage” fund for vulnerable countries at COP27 through support to Pakistan’s Vice-Presidency and G77 chairmanship



Flood in Pakistan 2022, District-wise crops affected area

## Pakistan (Balochistan) – groundwater

- Evaluating the impact of different policies on costs: provincial GDP and household income of groundwater depletion



**-3.39%**

Provincial GDP declines due to groundwater depletion

# EOI2: Integrated water productivity and storage

## Central Asia

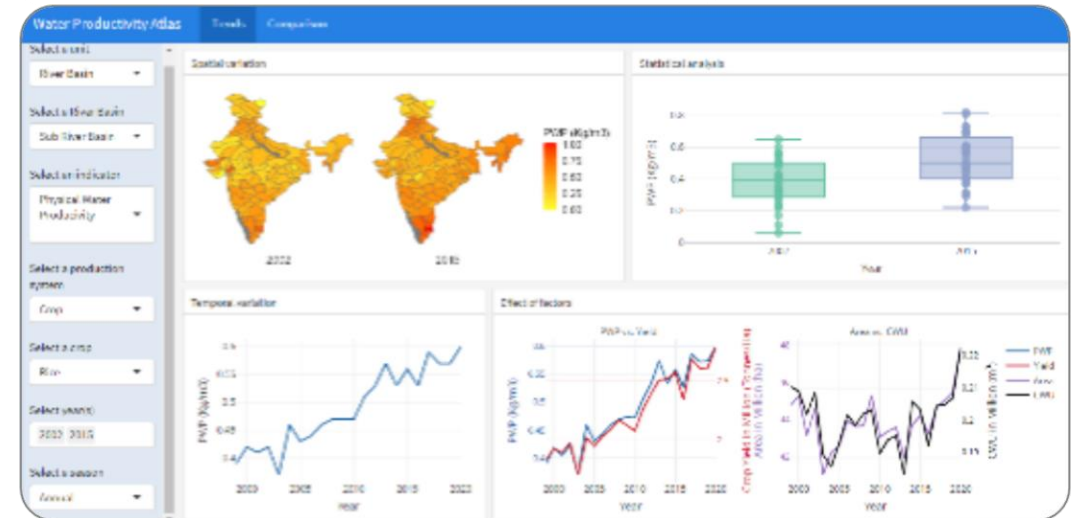
- Comprehensive inventory of water-land management practices for improving water productivity
- Co-design of user-friendly DSS dashboard to guide identification of best practices in particular contexts

## India

- Physical, Economic, Nutritional, Energy and Water Footprint Atlas

## Limpopo

- Mapped and characterized benefits of sand dams (alternative under-utilized storage option) in partnership with NGO (Dabane Trust) and catchment councils



# EOI3: Equitable clean energy access



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## South Asia

- Women's Empowerment in Energy Index (WEEI) piloted in 3 countries (India, Nepal, Pakistan)
- Conceptual paper on WEEI drafted with GENDER Platform
- Working with World Bank on "Roadmap for solarization of agriculture in Punjab"
- Solar irrigation pump sizing tool in India; investigating opportunities of take-up in Nepal



## Ethiopia

- Direct support to Ministry of Water and Energy on co-localizing irrigation and energy infrastructure
- Assessed gendered benefit streams from electricity access at household and village levels



# EOI4: Improving governance across WEFE systems

## Multi-stakeholder platforms (MSPs)

- Established community of practice across CGIAR Initiatives
- Guidelines provide guidance for NEXUS Gains researchers on how to improve (gender) inclusiveness and effectiveness in MSPs

## Groundwater Governance Toolbox

- Review paper and international workshop on institutional tools for groundwater governance
- Working with stakeholders to combine tools in India, Nepal, Pakistan, Uzbekistan

## Shaping global discourse on systems transformation via multilateral environmental agreements

- Climate Change COP27
- Convention on Biological Diversity (CBD) COP15
- Ramsar COP14
- UN 2023 Water Conference



# EoI5: WEF E capacity building

## Nepal

- Delivery of demand-driven training on nexus approaches to government of Nepal irrigation department to support revised irrigation policy
- Development of innovative nexus leadership program targeting women professionals

## Pakistan

- Development and piloting of scorecard to assess institutional and staff capacities to address WEF E nexus among professionals

## Southern Africa

- Implementation of multi-partner WEF Nexus Master-class/Winter School targeting SADC practitioners
- South-to-South exchange between Africa and Asia on solar irrigation deployment strategies, business models and decision support tools



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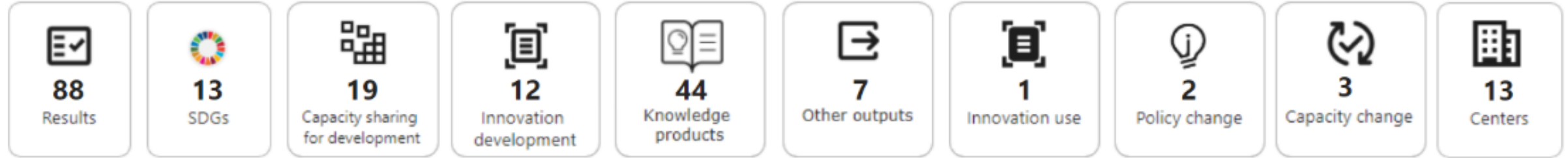


## Elevating the role of water resilience in food system dialogues

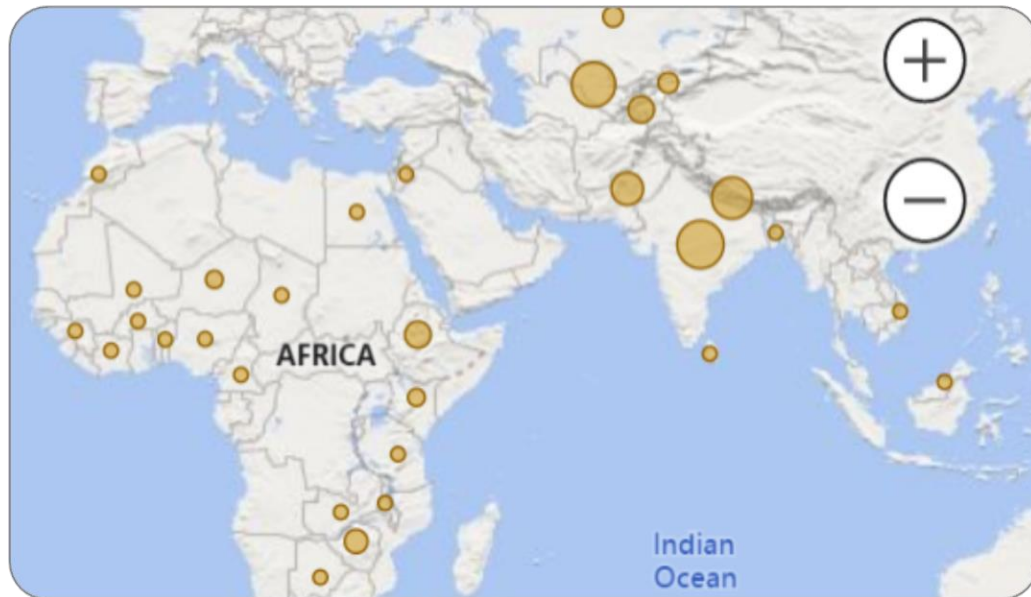
[Nathanial Matthews](#)<sup>a</sup>  , [James Dalton](#)<sup>b</sup>, [John Matthews](#)<sup>c</sup>, [Holly Barclay](#)<sup>d</sup>, [Jennie Barron](#)<sup>e</sup>, [Dustin Garrick](#)<sup>f</sup>, [Line Gordon](#)<sup>g</sup>, [Saleemul Huq](#)<sup>h</sup>, [Tom Isman](#)<sup>i</sup>, [Peter McCornick](#)<sup>j</sup>, [Alqayam Meghji](#)<sup>k</sup>, [Naho Mirumachi](#)<sup>l</sup>, [Shehnaaz Moosa](#)<sup>m</sup>, [Mark Mulligan](#)<sup>l</sup>, [Andrew Noble](#)<sup>k</sup>, [Olga Petryniak](#)<sup>n</sup>, [Jamie Pittock](#)<sup>o</sup>, [Cibele Queiroz](#)<sup>a</sup> <sup>g</sup>, [Claudia Ringler](#)<sup>p</sup>, [Mark Smith](#)<sup>q</sup>...[Louise Whiting](#)<sup>r</sup>



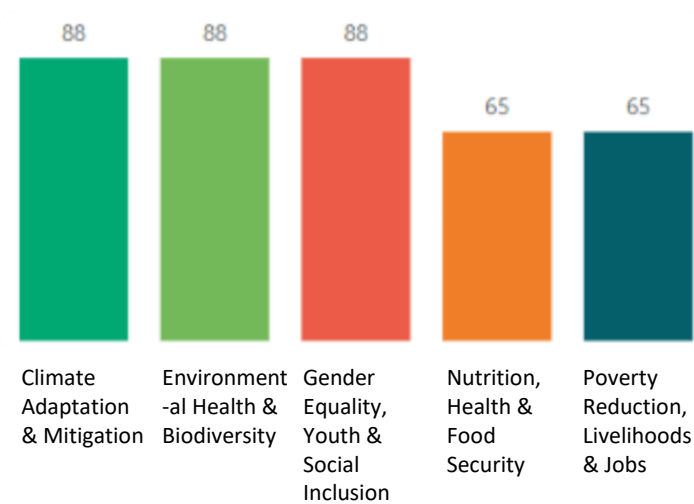
# Progress on results



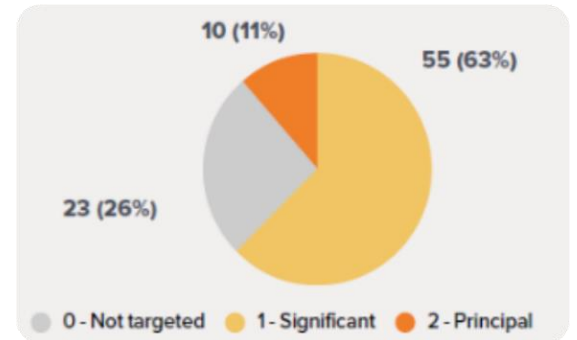
## Results by country



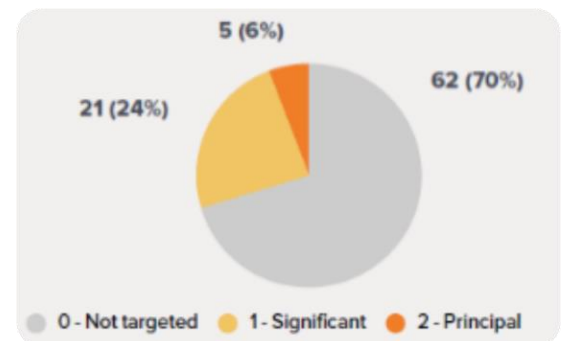
## Impact Area contributions



## Results by gender tag



## Results by climate tag



# Innovation portfolio



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Economywide effects of water and energy interventions tool

WEFE capacity building tool

Environmental Flow Tool

Agrobiodiversity Index

Water Storage Diagnostic

Water Productivity Assessment Tool

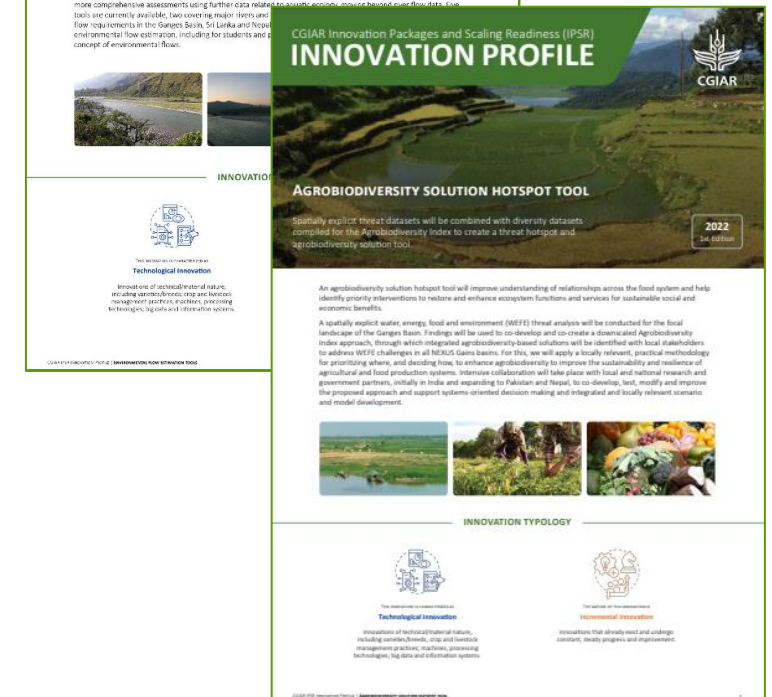
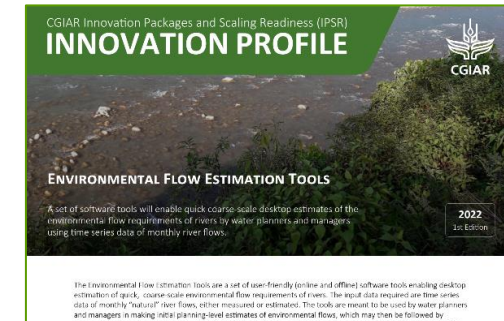
South Asia Drought Monitoring System

Groundwater governance toolbox

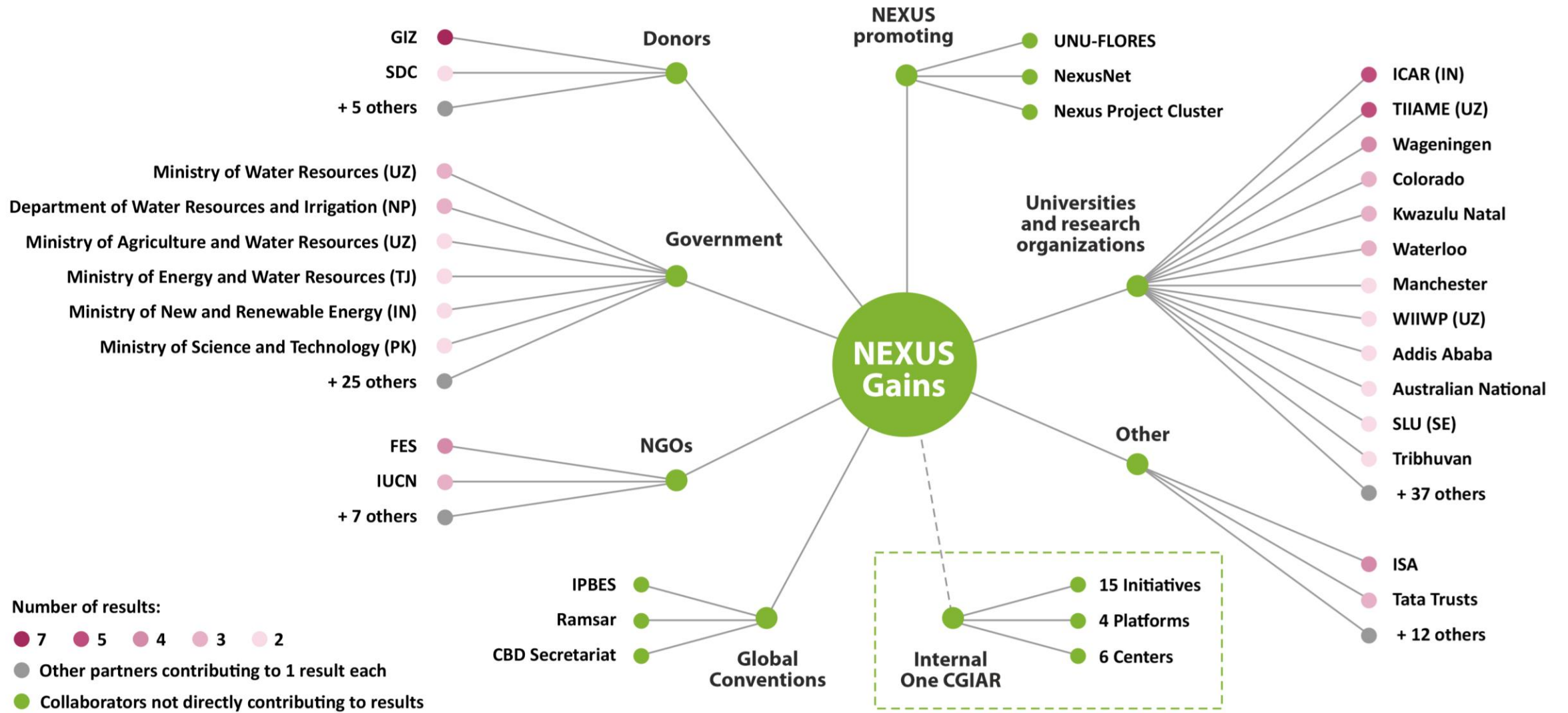
Business Model: Solar Irrigation Enterprises

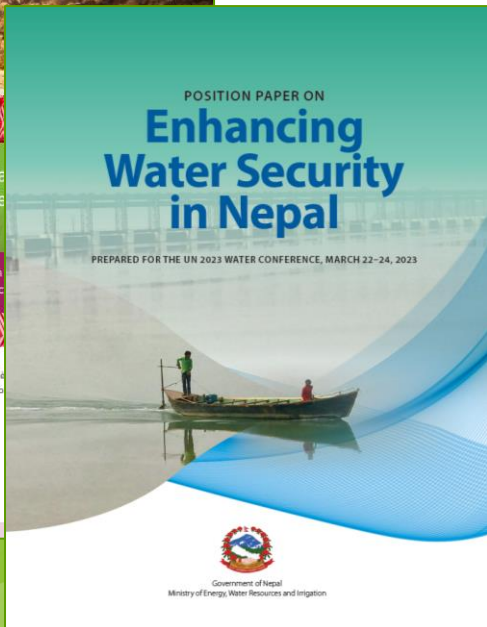
Business Model: SPaRC (Solar Power as Remunerative Crop)

Solar Irrigation Pump (SIP) Sizing Tool – Replication in Nepal



# Partnerships





Thank you!



More information at:

[cgiar.org/initiative/nexus-gains](https://cgiar.org/initiative/nexus-gains)

