IWMI
International Water Management Institute

CGIAR

# 5th Meeting
## Consultative Committee, IWMI-Nepal

11 February 2022

11:00-12:30

*Virtual meeting due to COVID-19*

# Agenda : 5th Meeting

| | |
|---|---|
| 11:00 –11:10 | Welcome, purpose and agenda of the meeting- DG, DWRI |
| 11:10 – 11:15 | Participant's introduction - All |
| 11:15 – 11:40 | Brief on IWMI and its strategic research program in Nepal, and research highlights, June 2021- Jan 2022 - IWMI |
| 11:40 -11:50 | Brief on One-CGIAR and regional initiatives- IWMI |
| 11:50 -12:00 | Guidance and suggestion for IWMI's research for development priority – all members of consultative committee |
| 12:00 –12:10 | Concluding remarks - DG, DWRI |

CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

# IWMI Introduction

IWMI International Water Management Institute

# IWMI's Introduction

**VISION**

A water secure world

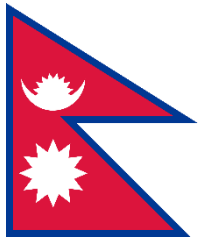
**MISSION**

To provide water solutions for sustainable, climate-resilient development

**RESEARCH**

Science for a transformative agenda

# Nepal




# 1986

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**Initial engagement for policy support to the GON**

National Planning Commission's Irrigation Master Plan

Participatory Management Action Plan for the Banganga Irrigation System

Government of Nepal's Indrawati River Basin Water Transfer Plan

# IWMI's Global Strategy, 2019-2023

## WATER CHALLENGES

### Food

- Improve Food Security
- Conserve Ecosystems & Water Resources

### Climate

- Adapt to & Mitigate Climate Change
- Build Resilience to Societal Disruption

### Growth

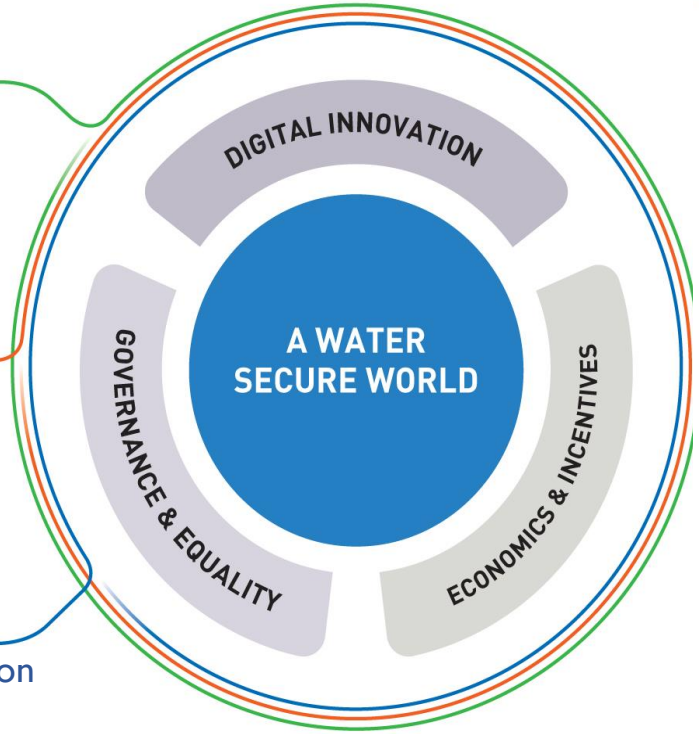
- Promote Sustainable Growth
- Achieve Gender Equality & Inclusive Societies

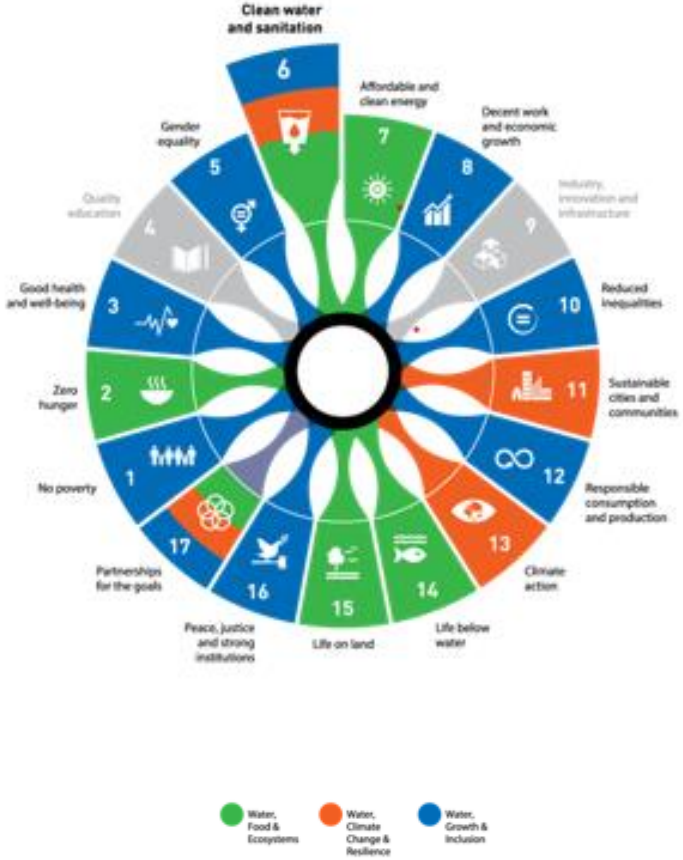
## IWMI'S STRATEGIC PROGRAMS

Water, Food & Ecosystems

Water, Climate Change & Resilience

Water, Growth & Inclusion



# A roadmap for IWMI-Nepal, 2019-2023

*Towards improved and inclusive water resources management for prosperity and inclusive growth*

## Water, Food & Ecosystems

- **Scaling sustainable and inclusive farmer-led irrigation development** for improved nutrition and livelihoods
- **Agricultural collectives and multi-use water** systems (MUS) as solutions to inclusive food system
- **Nature-Based Solutions**

## Water, Climate Change & Resilience

- **Basin and watershed level** hydro-economic and climate scenario analysis
- **Water induced disaster risk management** and resilience building
- **Watershed resilience**

## Water, Growth & Inclusion

- **Inclusive and resilient water supply**
- GESI **transformative actions** in the water sector
- **Migration, youth, gender and water**

## Digital inclusion & GESI

- Hydroinfomatics (HyInfo)
- Capacity development

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# Update on IWMI's research engagement:
July 2021- February 2022

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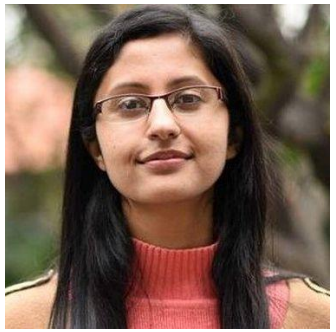
# IWMI staff-Nepal

Gitta Shrestha
Researcher – Gender, Social and Env. Justice

Khem L. Tamang
Office Assistant cum Driver

Labisha Uprety
Senior Research Officer-Policy and Governance



Dr. Manohara Khadka
Country Representative

Dr. Nirman Shrestha
Researcher – Agriculture Water Management

Om Acharya
Office Manager

Ramesh Tamang
Administration and Logistics Assistant

Shisher Shrestha
Researcher - Renewable Energy & Climate Change

**New recruitment:**

**By March/April:**

1. Dr. Santosh Nepal Researcher- Water and Climate Change
2. SRO-Hydrologist
3. National Researcher-Social Science

**By June/July [depend on funding situation]**

1. Senior Research Officer-Social Science
2. Senior Research Officer-Biophysical
3. Comms and Outreach Specialist

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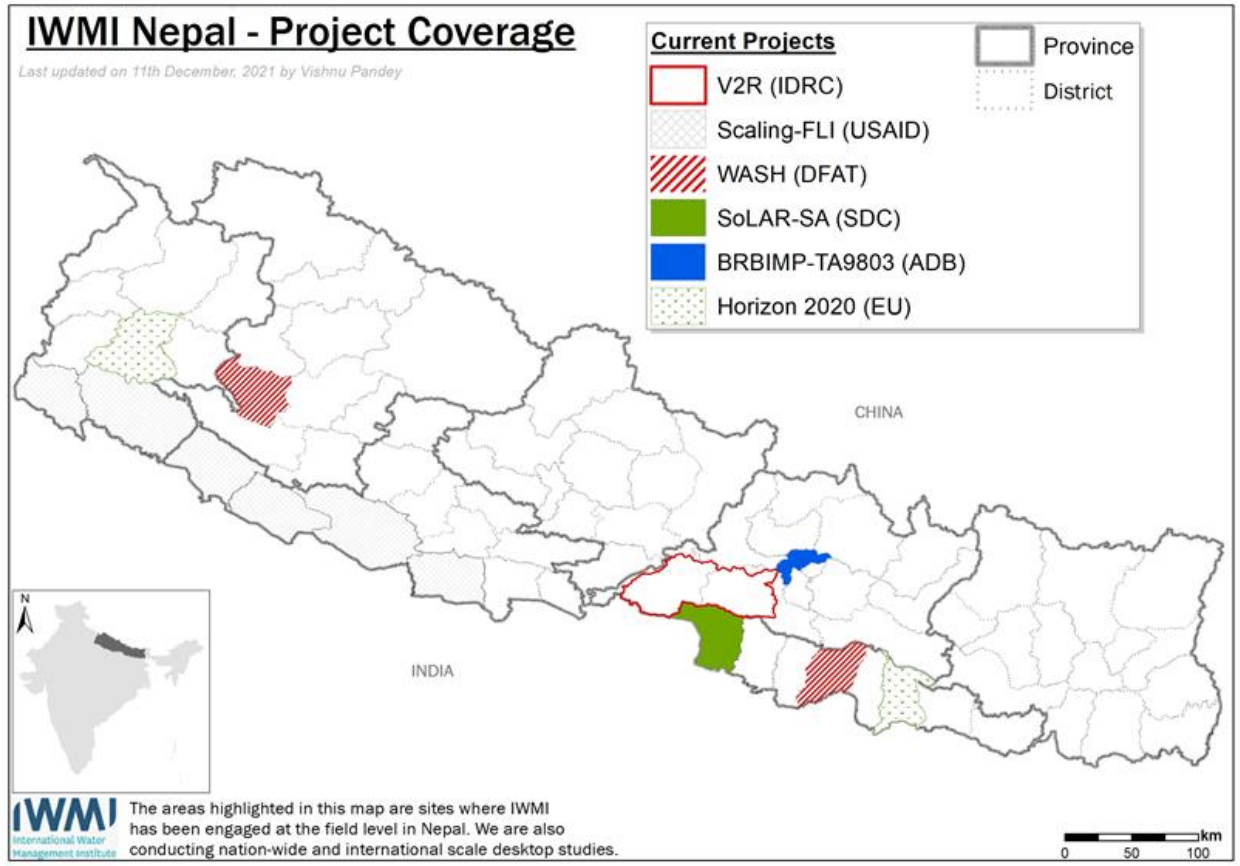
# Project Areas and Partnership




GON

USAID FROM THE AMERICAN PEOPLE

ICIMOD

Australian Government
Department of Foreign Affairs and Tr

NWO
Netherlands Organisation for Scientific Research

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

ADB

ACIAR

Duke UNIVERSITY

iDE नेपाल Nepal

IDRC | CRDI

WAGENINGEN UNIVERSITY & RESEARCH

CIMMYT International Maize and Wheat Improvement Center

NDF NORDIC DEVELOPMENT FUND

KU RESEARCH The University of Kansas

SNV

Smart WASH Solutions
For Better Tomorrow
Kathmandu, 2018

FMIST

WaterAid

UNIVERSITY OF SOUTHERN QUEENSLAND

Everest Club, Dailekh
Estd. 2050
एभरेष्ट क्लब, दैलेख

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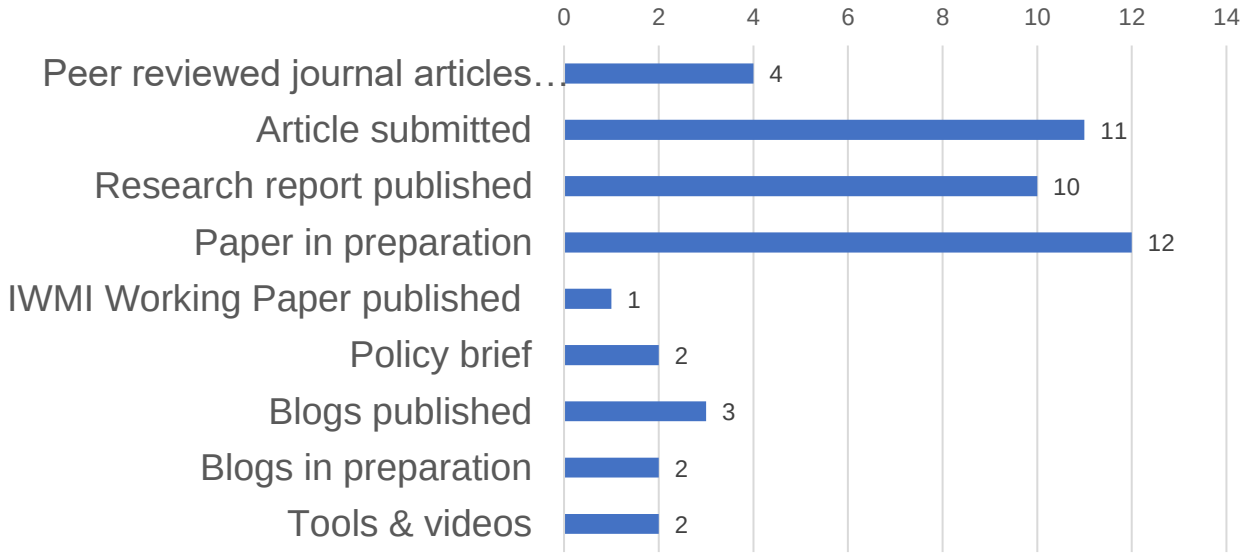
# Completed, existing and pipeline projects

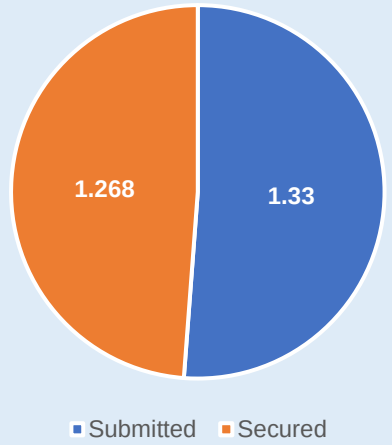
| | Water, Food & Ecosystem (WFE) | Water, Climate Change & Resilience (WCCR) | Water, Growth & Inclusion (WGI) |
|---|---|---|---|
| Completed in 2021 | | Water induced disaster & resilience of those left behind (V2R) | WASH and Gender |
| Current & new (8) | Sustainable and inclusive irrigation development framework for Nepal (CSISA) | Solar Irrigation for Agricultural Resilience (SoLAR) | Migration and agriculture |
| | Water-Energy- Food- Forest-Biodiversity Nexus Gains [New] | - TA-Bagmati River Basin Improvement Project [New] | Karnali Water Activity [New] |
| | Sustainable Intensification-Mixed Farming System [New] | | |
| Pipelines (2) | Watershed management & crop and water Management | Spring revival | |

# Research engagement: 2021

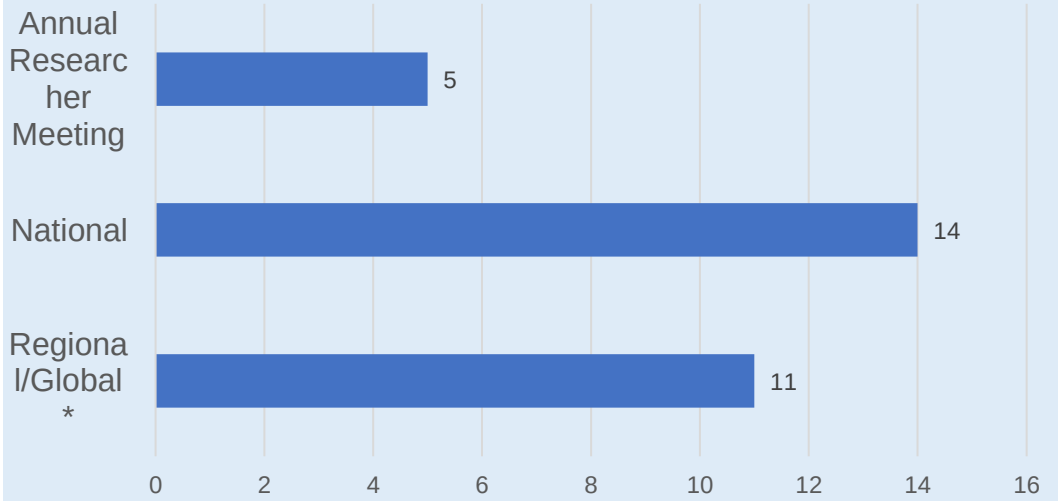
## Scientific outputs, 2021




## Resource Mobilisation [US$ 2.59 mil]




## Presentation (N=30)




| Evidence informed capacity building activities [N=11) | No. |
|---|---|
| Radio Dialogues on WASH & Gender | 2 |
| Solar Technicians Training | 3 |
| Multi-stakeholder Dialogues [Inclusive Irrigation Development] | 3 |
| Participatory Gender Training Manual Orientation | 3 |

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# Some research highlights: July 2021- February 2022

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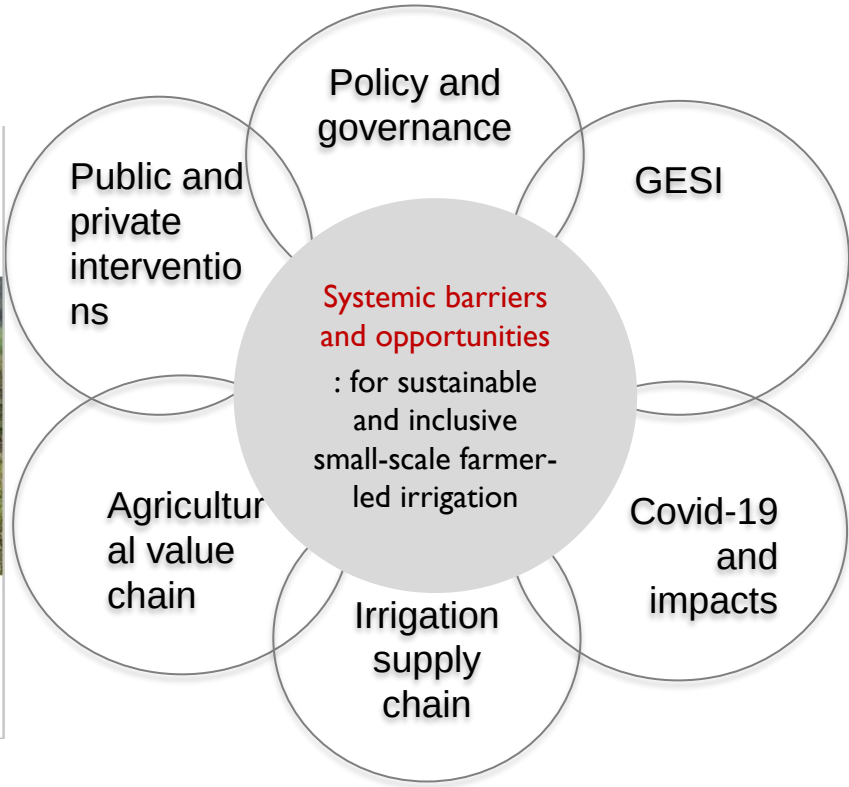
# The CSISA Nepal Covid-19 Response and Resilience Activity

**Objective:**
To develop an integrated framework for scaling farmer-led irrigation development (FLID) in Nepal


## Research approaches:

- Multi-stakeholder dialogues
- Cross-sectoral integration in water issues analysis
- Systemic analysis of opportunities and barriers for scaling farmer-led irrigation development (FLID)

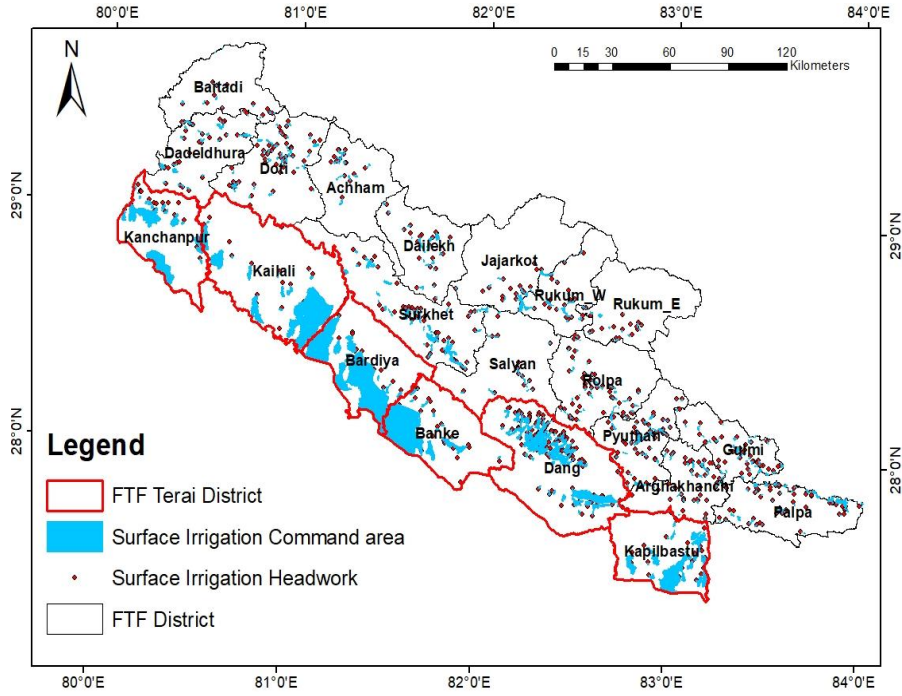
## OUTCOMES

- The framework will guide for investment in sustainable and inclusive FLID
- Advances **roles, agency and knowledge** of women and marginalized

# Key highlights: biophysical research

***Overall, greater potential for sustainable use of groundwater resources for building resilience of smallholders and covid-19 impacted populations:***

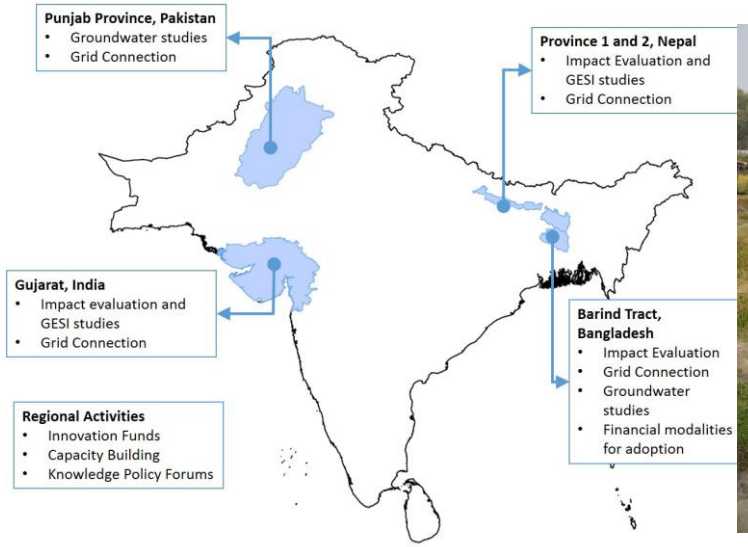
- Surface and ground water irrigation systems irrigate: **72% and 28% of** total irrigated land
- **Roughly 88% of the** groundwater that could be abstracted on a sustainable basis in Nepal is yet to be utilized.
- **Scientific knowledge and data gaps:**
  - Literature on Conjunctive Use and groundwater in the Tarai region of Nepal is almost non-existent.
  - Water demand for different crops
  - Hydrogeological characterization of aquifer systems and their spatial distribution across the Nepal's terai
  - Location of groundwater monitoring wells, and assessment of sustainable yield from different locations within the aquifer
- **Need for** devising and operation of monitoring of sustainable uses of GW resources for domestic and agriculture



# Key highlights: social research

- **Limited policy** interventions to invest in and support for small-scale/farmer led irrigation and irrigation management
- Need to **develop more robust irrigated agriculture value chains** and irrigation supply chains through addressing concerns of the private sector and smallholder farmers
- **Transformative actions in** the irrigation and agricultural development system to empower youths, women entrepreneurs, professionals, leaders, farmers, researchers.
- **Scientific data and knowledge gaps:**
  - Water and food system nexus in the face of climate change and the Covid-19 pandemic
  - Opportunities and barriers of water resources management and development in the context of federalism

# Solar Irrigation for Agricultural Resilience in South Asia (SoLAR-SA) Project




**Project Duration**

- 2019.12 – 2023.11

**Funded by**

- Swiss Agency for Development and Cooperation

**Project Partners:**

- Alternative Energy Promotion Centre
- Nepal Electricity Authority
- Chhipaharmai Rural Municipality

**Project activities in Nepal:**

- Impact assessment of solar power irrigation pumps (SIP)
- GESI qualitative study
- Pilot on microgrid connection to SIPs
- Knowledge forums and capacity building

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

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नेपाल विद्युत प्राधिकरण स्था : २०४२ ESTD 1985 NEPAL ELECTRICITY AUTHORITY



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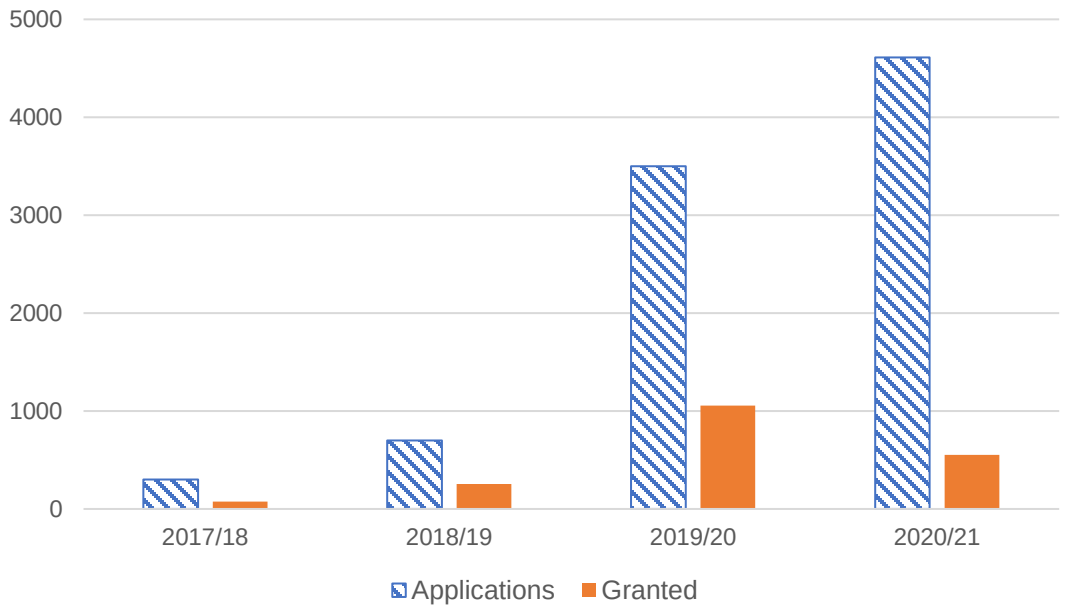
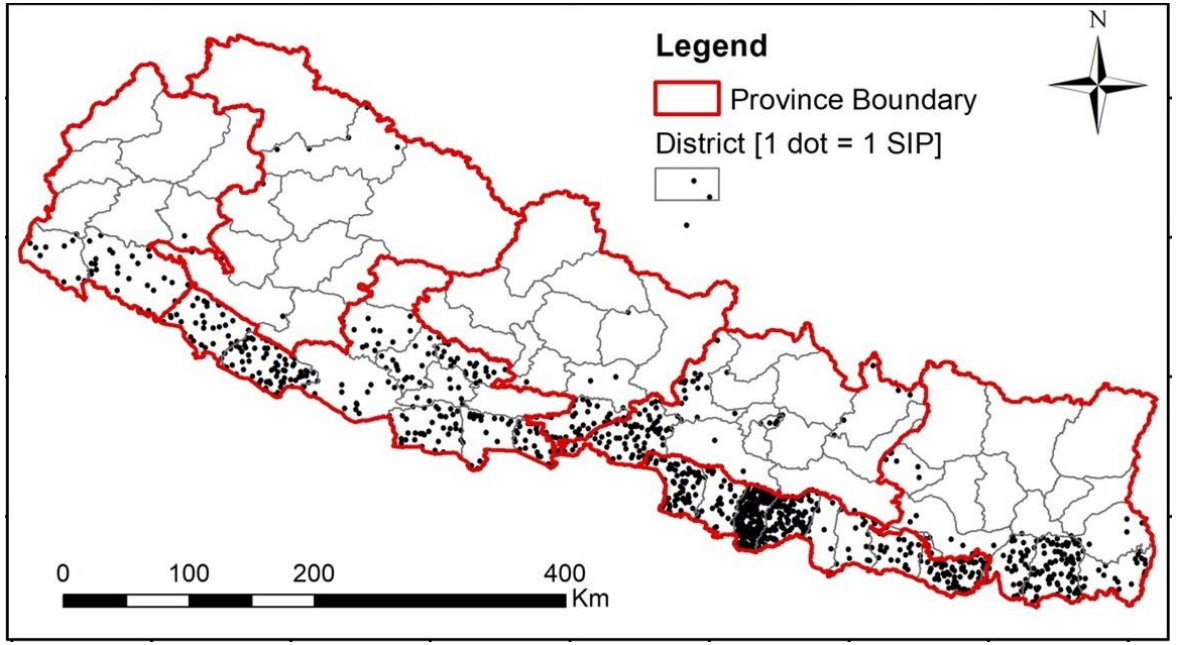
# Finding 1: ~20% of 9100 farmers who applied for SIPs received subsidized SIPs from AEPC




Source: AEPC Data

# Finding 2: Those who did not apply for SIPs were the smallest and marginal farmers from disadvantaged communities

| | Applied SIPs | | | | Not applied SIPs | | Difference (1-3) | Difference (1-5) |
|---|---|---|---|---|---|---|---|---|
| | SIP farmers | | Non-SIP farmers | | Non-SIP farmers | | | |
| | mean (1) | sd (2) | mean (3) | sd (4) | mean (5) | sd (6) | | |
| Female head (yes=1) | 0.07 | 0.25 | 0.06 | 0.24 | 0.04 | 0.20 | 0.00 | 0.03 |
| Age of head (years) | 55.10 | 12.20 | 52.19 | 12.38 | 52.69 | 12.70 | 2.91*** | 2.41* |
| Education of head (secondary and above=1) | 0.57 | 0.50 | 0.52 | 0.50 | 0.36 | 0.48 | 0.05 | 0.21*** |
| Household size | 7.78 | 3.77 | 8.10 | 4.38 | 7.07 | 3.89 | -0.32 | 0.71* |
| Caste | | | | | | | | |
| Brahmin/Chhetri (yes=1) | 0.23 | 0.42 | 0.24 | 0.43 | 0.18 | 0.39 | -0.01 | 0.05 |
| Yadav (yes=1) | 0.60 | 0.49 | 0.60 | 0.49 | 0.60 | 0.49 | 0.00 | 0.00 |
| Tharu (yes=1) | 0.11 | 0.32 | 0.05 | 0.22 | 0.04 | 0.20 | 0.06** | 0.07** |
| Muslim (yes=1) | 0.03 | 0.18 | 0.08 | 0.28 | 0.06 | 0.24 | -0.05** | -0.03 |
| Other caste (yes=1) | 0.03 | 0.16 | 0.03 | 0.17 | 0.11 | 0.32 | 0.00 | -0.09*** |
| Land owned (kattha) | 75.03 | 78.61 | 56.90 | 54.97 | 37.23 | 52.15 | 18.13*** | 37.8*** |
| Cattle/buffalo (#) | 2.17 | 2.17 | 2.19 | 2.03 | 1.89 | 1.86 | -0.02 | 0.27 |
| Separate rooms (#) | 5.10 | 1.97 | 4.65 | 1.81 | 4.11 | 1.62 | 0.45** | 0.99*** |
| Cooking fuel (firewood or dungcake=1) | 0.71 | 0.45 | 0.81 | 0.39 | 0.85 | 0.36 | -0.10*** | -0.14** |
| No. of observations | 303 | | 205 | | 148 | | 508 | 451 |

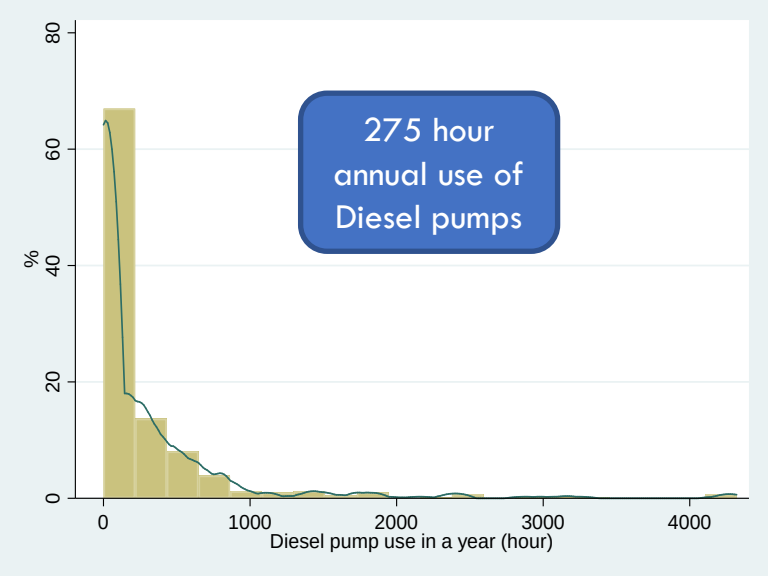
Source: Household survey, 2021

Reinforces our initial findings – the most marginal did not get opportunity to apply

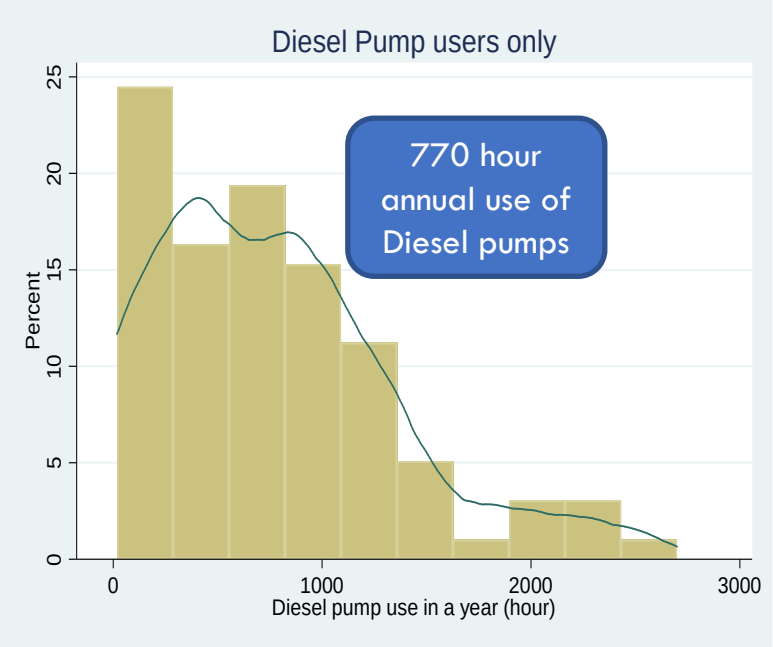
**However, among those who applied, AEPC choose smaller farmers and women farmers**

# Finding 4: SIPs reduce diesel use

**Finding 4.1:** SIPs are used for ~750 hours and SIP owners also use diesel pumps for ~275 hours in a year **– SIPs reduce but not replace diesel**




Diesel use by SIP users




Diesel use by diesel pump users

Source: Phone Survey, 2021

# Finding 4: SIPs reduce diesel use

**Finding 4.3:** SIP farmers reduced diesel pump use by **64 and 33 percent** for monsoon paddy and wheat, respectively.

| | Logarithm of diesel pump use (minutes per katha) | | | |
|---|---|---|---|---|
| | Kernel matching | Nearest neighbor matching | | |
| | | Neighbor=1 | Neighbor=3 | Neighbor=5 |
| | (1) | (2) | (3) | (4) |
| Monsoon paddy | | | | |
| Impact of SIPs | -0.644*** (0.069) | -0.649*** (0.079) | -0.616*** (0.061) | -0.623*** (0.059) |
| No. of observations | 377 | 392 | 392 | 392 |
| Wheat | | | | |
| Impact of SIPs | -0.326*** (0.079) | -0.392*** (0.093) | -0.378*** (0.078) | -0.359*** (0.078) |
| No. of observations | 321 | 338 | 338 | 338 |

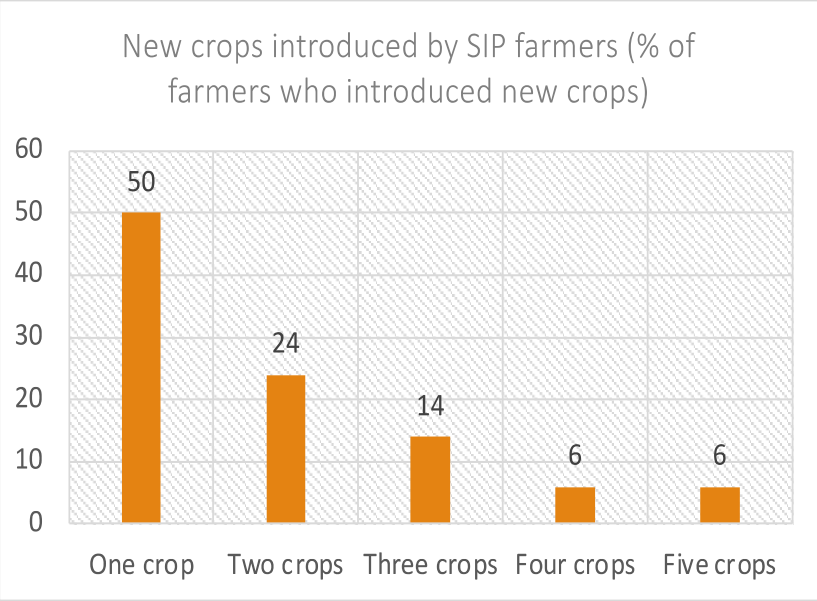
Note : The results are robust to the sensitivity analysis.

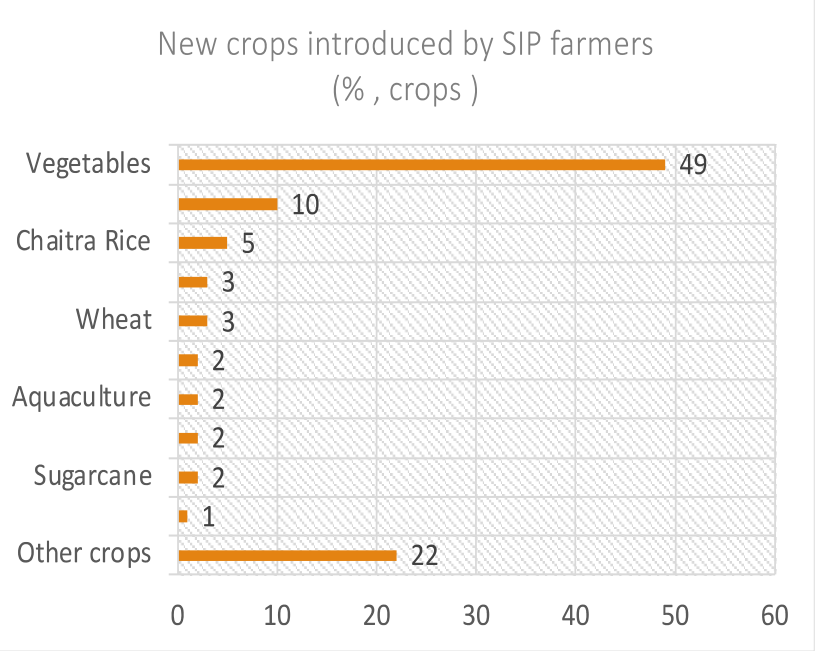
- **Outcome variable :** Logarithm of diesel pump use (minutes per katha).
- **Treatment :** SIP farmers
- **Counterfactual :** Farmers didn't have SIPs (irrespective of whether they applied for SIP or not)
- **Method :** PSM (Kernel)

Source: Household Survey, 2021

# Finding 5: SIP farmers introduce new crops

**Finding 5.1: 21%** of SIP farmers introduced new crops, mostly vegetables after they started using SIPs




1% increase in SIP use is associated with 7% increase in the likelihood of introducing new crops

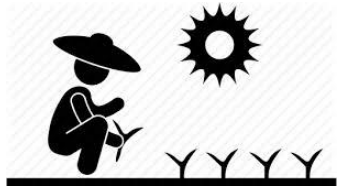
Source: Phone Survey, 2021

# SIPs and equity outcomes are mixed and not well understood (1)

**Small, marginal farmers and sharecroppers get access to SIPs**

## AEPC in Nepal

- Prioritized small and marginal farmers, and women farmers among applicants

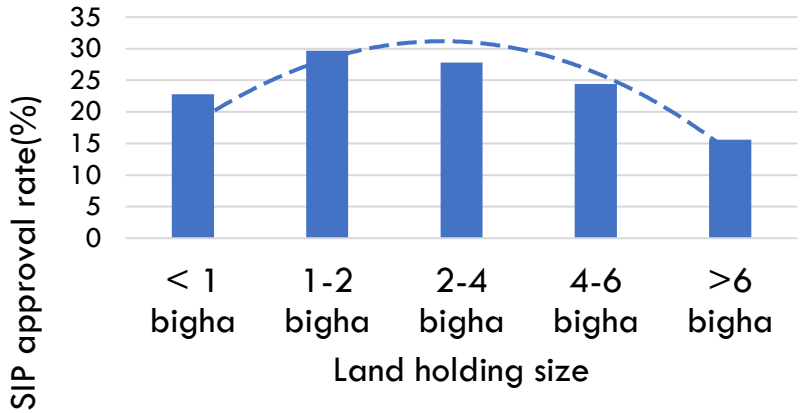


## ~36% sharecroppers in IDCOL SIPs

– this % was higher than their share in overall farmer population

Examples from SoLAR sites

Fig 1. Farmers who were allocated subsidized SIP by AEPC



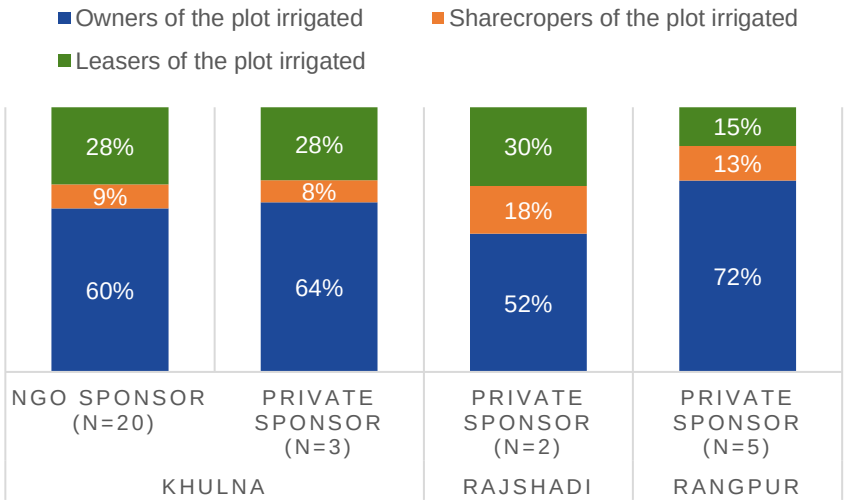




Fig 2. Farmers who got irrigation from IDCOL SIP by land tenure

CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

# Do water, energy and agricultural (WEF) policies promote gender transformative approaches and interventions in South Asia?

SoLAR Project-SA

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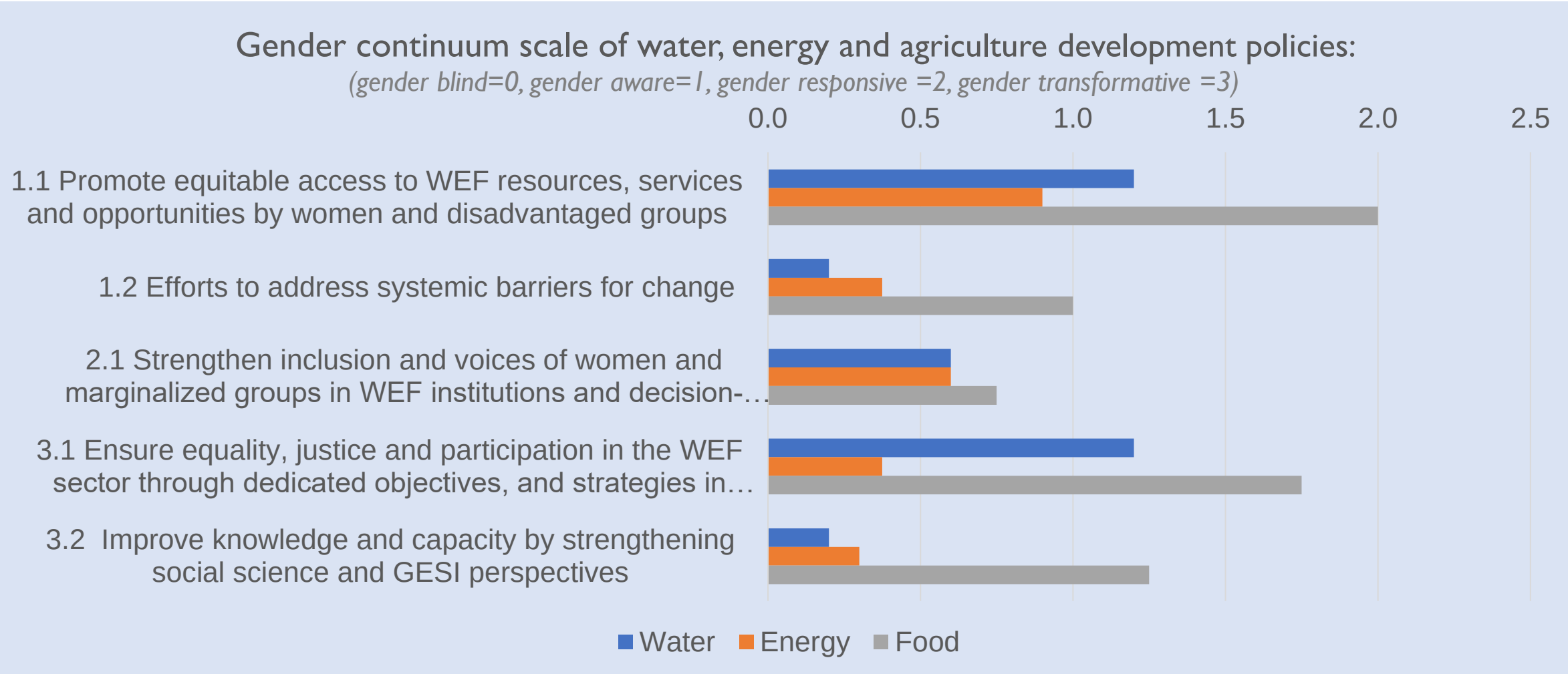
# Gender continuum scale (Mullinax et al. 2018; Kabeer and Subrahmanian, 1996)

| Gender - blind | Gender- aware | Gender - responsive | Gender - transformative |
|---|---|---|---|
| It implicitly focus on men's needs, interests and priorities in opportunities and resources (Kabeer and Subrahmanian, 1996). | Gender is considered in policy or program or research, but incorporation into actual work processes very limited. | Gender and social inclusion issues analysed and strategies for addressing GESI issues mainly focus on services and technologies and representation without challenging power relations and social norms. | Systemic /deep understanding of root causes behind inequalities.<br><br>Policy or program or research leads to actual shift in gender relations, interpersonally and/or at a structural level. |
| scale | 0 | 1 | 2 | 3 |

- **Gender transformative approach: systemic [structural and institutional] barriers for gender equality and women's empowerment, which include social and gender norms, and power relations. It empowers women and marginalized groups to engage in and benefit from water, energy and agricultural technologies and its scaling**

# **Finding 1:** Gender-aware WEF policies in Nepal




**More efforts are required to strengthen knowledge of GESI issues of WEF and integrate GESI measures in WEF policies**

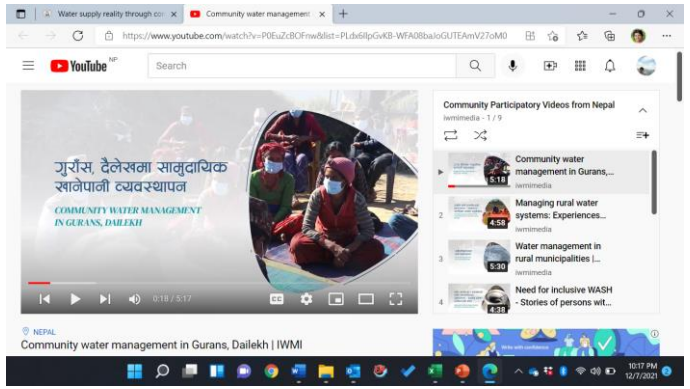
# Finding 2: SIP subsidy policies lack GESI perspectives

- No GESI specific subsidy policy and financing mechanisms for ensuring SIPs access by women and smallholder farmers
- **Yet, efforts of AEPC is commendable:** 22% of SIP recipients are women [Nepal]. An impact study is needed.

- There is a need for developing financing/business model that would facilitate access of SIP and/or water services by women and smallholder framers

# Enhancing Water Supply Systems in Nepal

**Research Focus:** A gender perspective to understand and enhance the functionality of water supply systems: lessons from Nepal

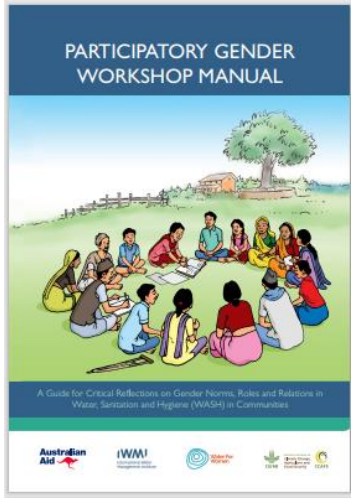


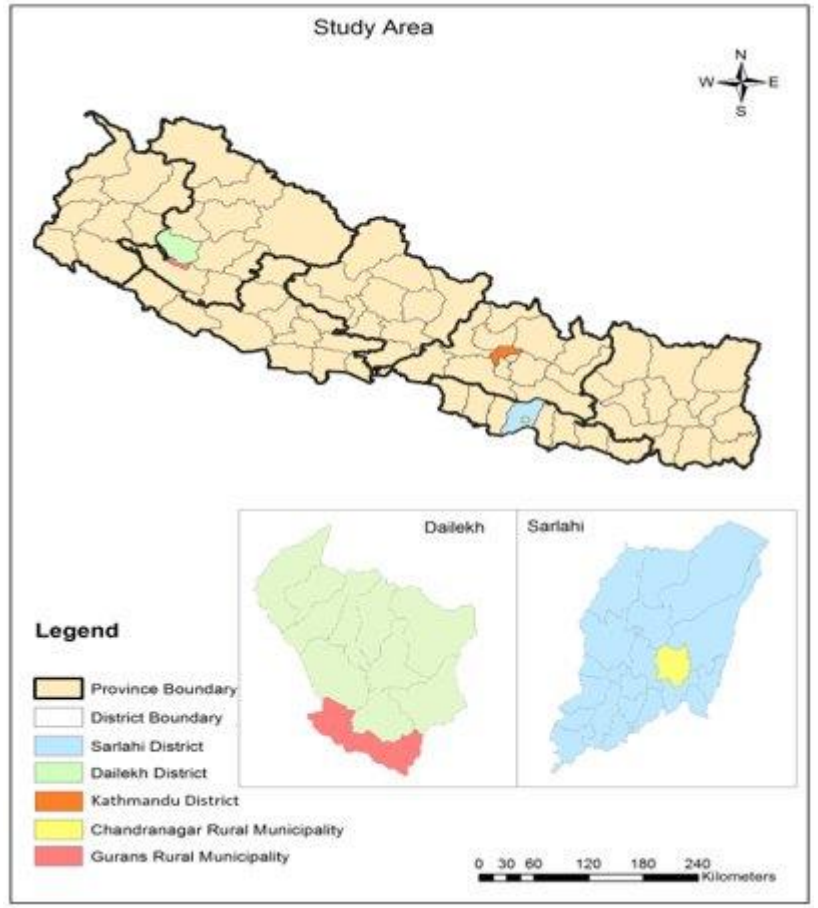

Community participatory videos on water supply issues

[Community Videos]

Participatory gender workshop manual

[Learning and unlearning throuhg role-play]




Public awareness on equity, inclusion and sustainability issues of rural water supply

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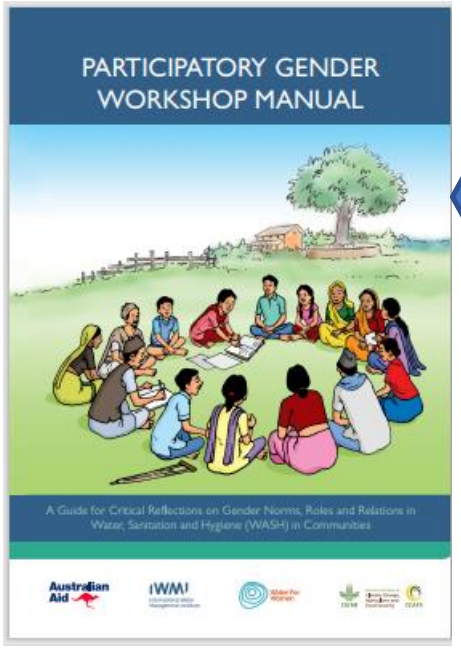
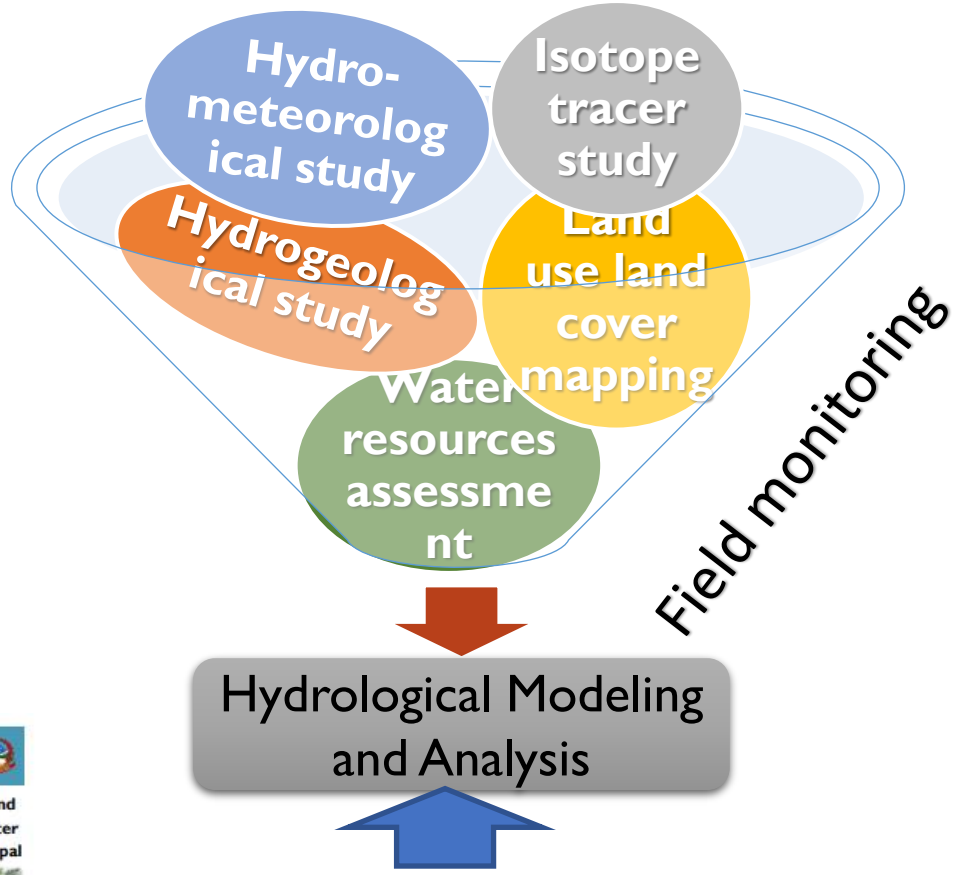
# Research uptake




1. USAID funded Karnali Water Activity Project expressed an interest to use the Participatory Gender Workshop Manual prepared by IWMI's **WASH and Gender/DFAT project.**


2. Findings of biophysical and social science research of the **CSISA project** have been guiding to develop a Sustainable Irrigation Development Framework in Nepal that will guide USAID and GoN for investment in farmer-led irrigation.




3. A critical review and reflection of the IWMI's previous project: **BCRWME/ADB** has provided insights for the design of the new Climate-resilient Landscapes and Livelihoods (CrLL) Project/ADB

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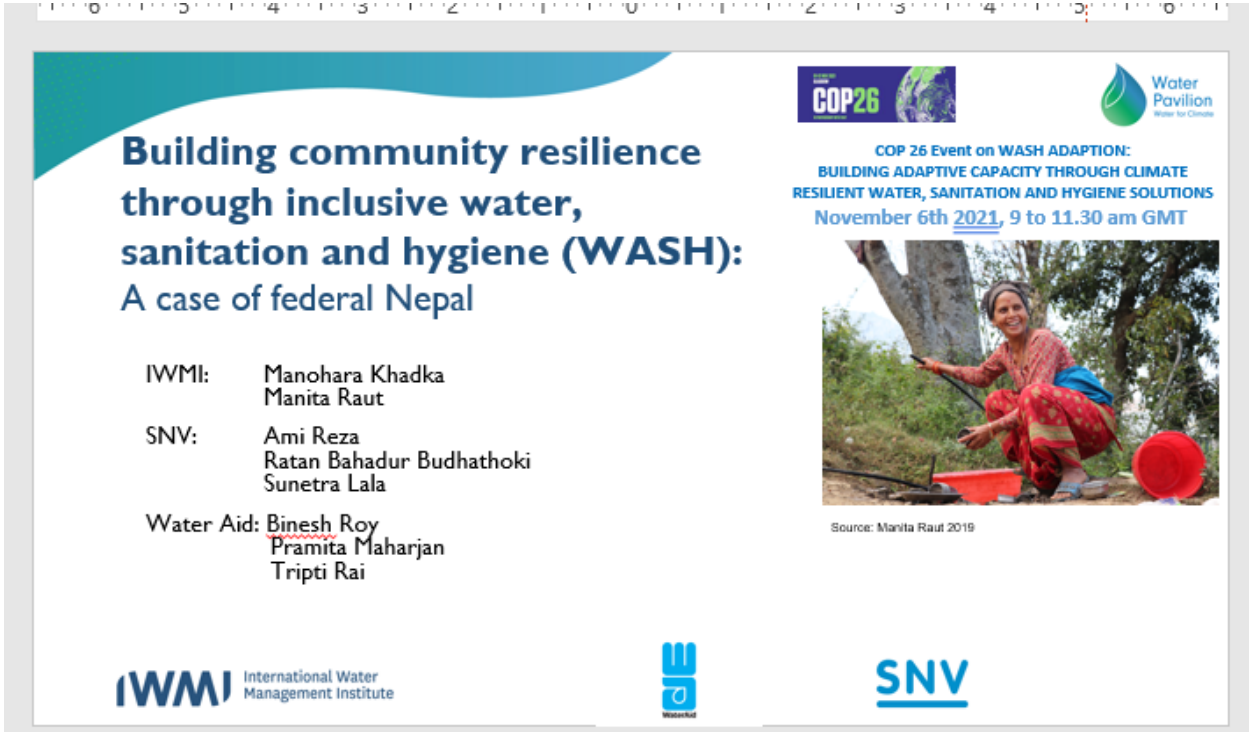
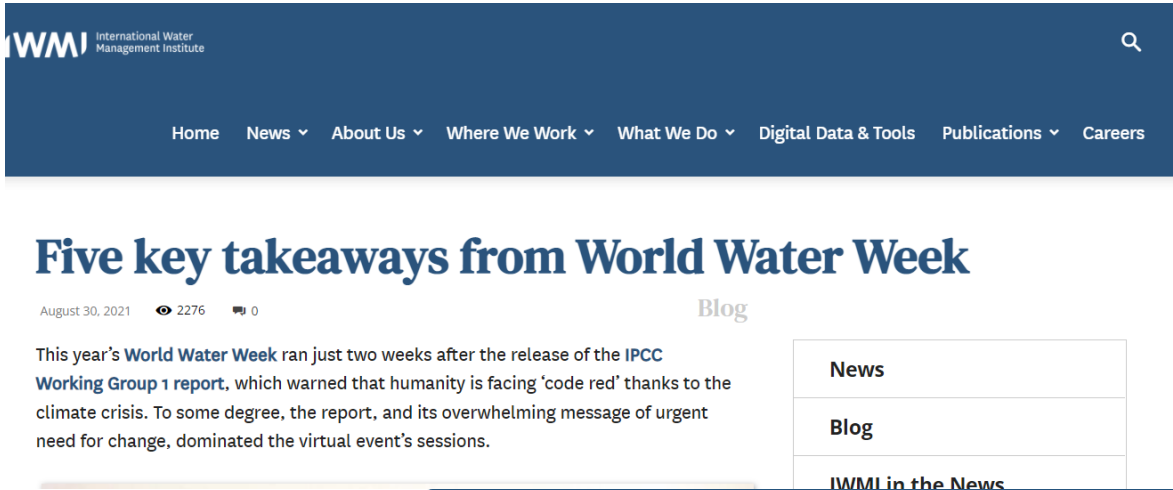
# IWMI representation in local, regional and global platforms, and evidence informed capacity development events

IWMI International Water Management Institute

# IWMI-Nepal in national and global forums




https://www.youtube.com/watch?v=P0EuZcBOFnw&list=PLdx6IlpGvKB-WFA08baJoGUTEAmV27oM0



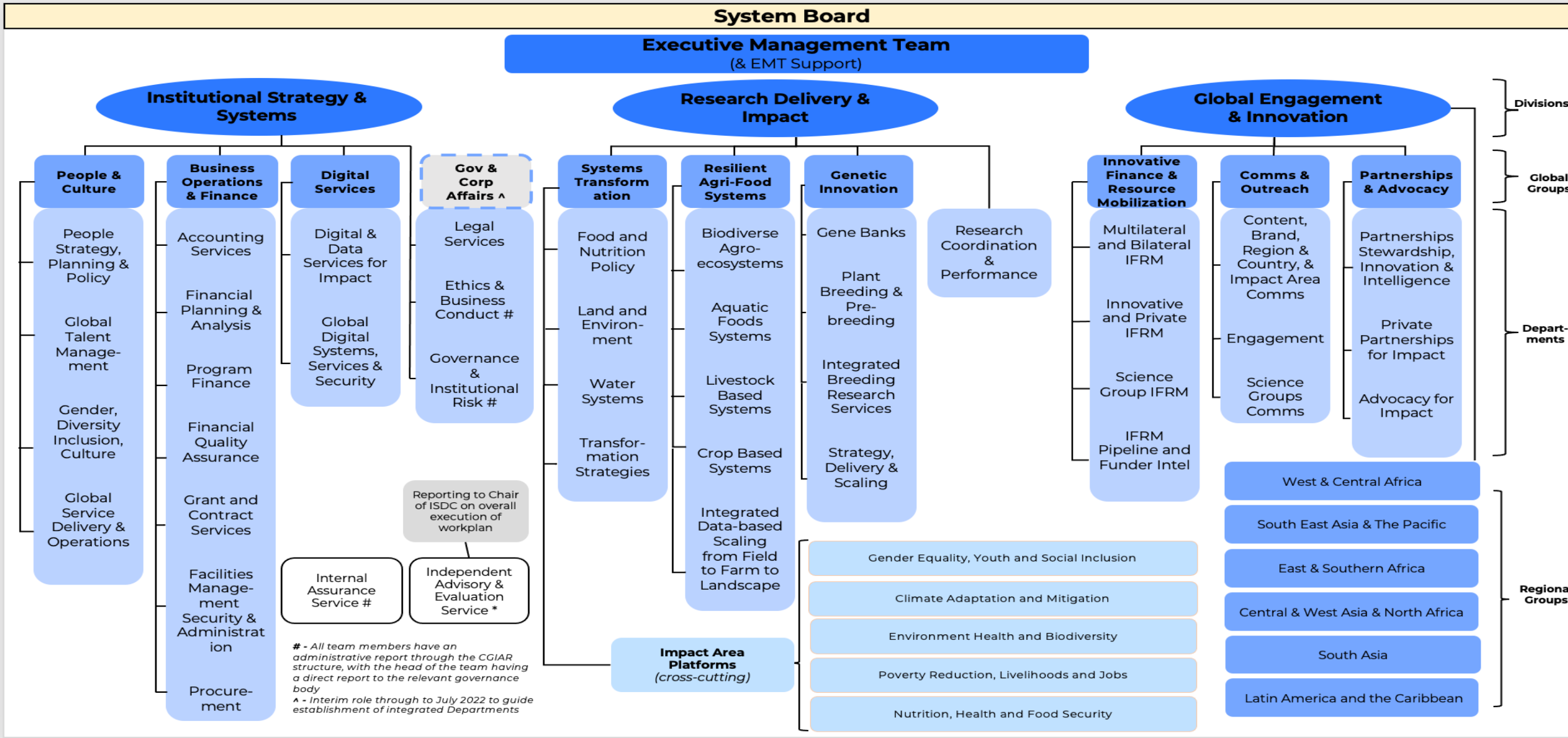
CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

# Briefing on One-CGIAR and its initiatives in Nepal

CGIAR

IWMI International Water Management Institute

# One CGIAR- Operational structure



# Global and regional integrated initiatives

- 32 Initiatives in Investment Prospectus
- 6 being Regional Integrated Initiatives
- Opportunities to work across different CG entities, thematic areas and geographical space
- 5 impact areas:

CLIMATE ADAPTATION & MITIGATION

ENVIRONMENTAL HEALTH & BIODIVERSITY

GENDER EQUALITY, YOUTH & SOCIAL INCLUSION

NUTRITION, HEALTH & FOOD SECURITY

POVERTY REDUCTION, LIVELIHOODS & JOBS

# Initiatives in Nepal


**Initiative:**

**NEXUS Gains:**
Realizing Multiple Benefits Across Water-Energy-Food-Forest-Biodiversity Systems

Thought Leadership Piece: https://on.cgiar.org/3yb8QPt

**Breaking Silos: Water-Energy-Food-Forest-Biodiversity Systems**
***Understand and manage trade-offs and build synergies***

1. Systems approach, truly integrated
2. Yes, IWRM, but nexus goes beyond
3. Many actors and stakeholders
4. Basin approach:
   - Quantification, accounting of WEFFB
   - Upstream-downstream inter-dependencies
   - Transboundary dimension
5. Scale dependencies of processes: Farm to landscape/watershed to basin scale
6. Polycentric and multi-level and governance
7. Gender, youth and inclusion
8. Importance of political economy

**Initiative:**
Sustainable Intensification of Mixed Farming Systems **(SI-MFS)**

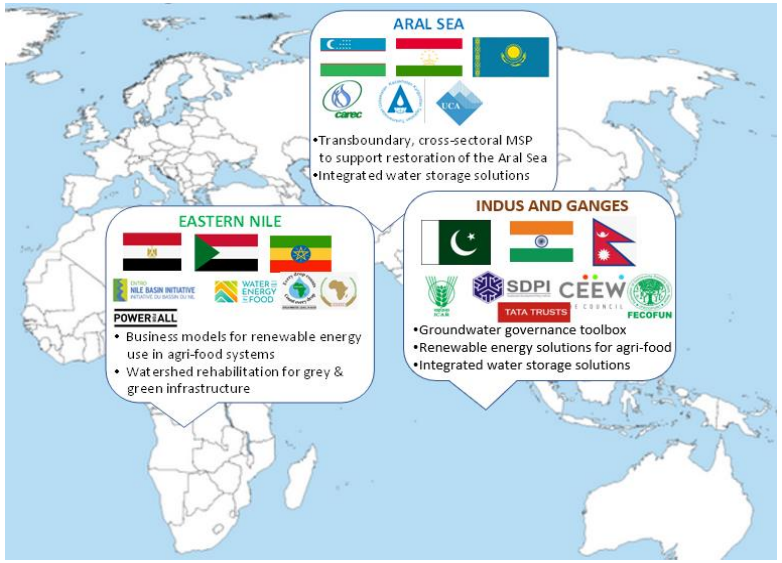

**Initiative:**
Transforming Agricultural Food System in South Asia **(TAFSA)**

**Initiative:**
Animal Productivity for Livelihoods, Nutrition, and Gender Inclusion **(SAPLING)**

**Initiative:**
**Nature-Positive Solution:** Enhancing Productivity and Resilience, Safeguarding the Environment, and Promoting Inclusive Community Growth

# Regional focus

**Nexus Gains**




1. Indus and Ganges—South Asia
2. Aral Sea — Central Asia
3. Eastern Nile—Eastern Africa

*Supported by global foresight and trade-off assessments, science-policy interface and capacity development*

SAVE the Date for the Nexus Gains Inception workshop

**23 Chaitra/6th April 2022**

**Sustainable intensification of Mixed Farming System**

# Discussions points:

1. What are the **key emerging water challenges**?
2. What are research and knowledge gaps and research/innovation needs for Nepal?

# Concluding remarks

- Director General, Department of Water Resources and Irrigation
- Member Secretary, President Chure-Terai Madhesh Conservation and Development Board

International Water Management Institute

# Thank you

**Innovative water solutions for sustainable development**

Food · Climate · Growth