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
IWMI's Introduction

**VISION**
A water secure world

**MISSION**
To provide water solutions for sustainable, climate-resilient development

**RESEARCH**
Science for a transformative agenda
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
IWMIs 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

IWMIs 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
Update on IWMI's research engagement:
July 2021 - February 2022
IWMI staff-Nepal

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

Gitta Shrestha
Researcher – Gender, Social and Env. Justice

Labisha Uprety
Senior Research Officer-Policy and Governance

Khem L. Tamang
Office Assistant cum Driver
Project Areas and Partnership

IWMI Nepal - Project Coverage

Current Projects:
- V2R (IDRC)
- Scaling-FLI (USAID)
- WASH (DFAT)
- SoLR-SS (SDC)
- BRBIMP-TA9803 (ADB)
- Horizon 2020 (EU)

The areas highlighted in this map are sites where IWMI has been engaged as the field level in Nepal. We are also conducting nationwide and international scale desk studies.
Completed, existing and pipeline projects

**Water, Food & Ecosystem (WFE)**
- Sustainable and inclusive irrigation development framework for Nepal (CSISA)
- Water-Energy- Food- Forest-Biodiversity Nexus Gains [New]
- Sustainable Intensification-Mixed Farming System [New]
- Watershed management & crop and water Management

**Water, Climate Change & Resilience (WCCR)**
- Water induced disaster & resilience of those left behind (V2R)
- Solar Irrigation for Agricultural Resilience (SoLAR)
- TA-Bagmati River Basin Improvement Project [New]
- Spring revival

**Water, Growth & Inclusion (WGI)**
- WASH and Gender
- Migration and agriculture
- Karnali Water Activity [New]
Research engagement: 2021

Scientific outputs, 2021

<table>
<thead>
<tr>
<th>Scientific Output</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer reviewed journal articles</td>
<td>4</td>
</tr>
<tr>
<td>Article submitted</td>
<td>11</td>
</tr>
<tr>
<td>Research report published</td>
<td>10</td>
</tr>
<tr>
<td>Paper in preparation</td>
<td>12</td>
</tr>
<tr>
<td>IWMI Working Paper published</td>
<td>1</td>
</tr>
<tr>
<td>Policy brief</td>
<td>2</td>
</tr>
<tr>
<td>Blogs published</td>
<td>3</td>
</tr>
<tr>
<td>Blogs in preparation</td>
<td>2</td>
</tr>
<tr>
<td>Tools &amp; videos</td>
<td>2</td>
</tr>
</tbody>
</table>

Resource Mobilisation [US$ 2.59 mil]

- Submitted: 1.268
- Secured: 1.33

Evidence informed capacity building activities [N=11]

<table>
<thead>
<tr>
<th>Activity</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio Dialogues on WASH &amp; Gender</td>
<td>2</td>
</tr>
<tr>
<td>Solar Technicians Training</td>
<td>3</td>
</tr>
<tr>
<td>Multi-stakeholder Dialogues [Inclusive Irrigation Development]</td>
<td>3</td>
</tr>
<tr>
<td>Participatory Gender Training Manual Orientation</td>
<td>3</td>
</tr>
</tbody>
</table>

Presentation (N=30)

- Annual Researcher Meeting: 5
- National: 14
- Regional/Global*: 11

* indicates multi-level engagement
Some research highlights: July 2021 - February 2022
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 groups in the process of scaling FLID

The CSISA Nepal Covid-19 Response and Resilience Activity
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
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

<table>
<thead>
<tr>
<th>Applied SIPs</th>
<th>Not applied SIPs</th>
<th>Difference (1-3)</th>
<th>Difference (1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SIP farmers</td>
<td>Non-SIP farmers</td>
<td>Non-SIP farmers</td>
</tr>
<tr>
<td></td>
<td>mean (1)</td>
<td>sd (2)</td>
<td>mean (3)</td>
</tr>
<tr>
<td>Female head (yes=1)</td>
<td>0.07</td>
<td>0.25</td>
<td>0.06</td>
</tr>
<tr>
<td>Age of head (years)</td>
<td>55.10</td>
<td>12.20</td>
<td>52.19</td>
</tr>
<tr>
<td>Education of head (secondary and above=1)</td>
<td>0.57</td>
<td>0.50</td>
<td>0.52</td>
</tr>
<tr>
<td>Household size</td>
<td>7.78</td>
<td>3.77</td>
<td>8.10</td>
</tr>
<tr>
<td>Caste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brahmin/Chhetri (yes=1)</td>
<td>0.23</td>
<td>0.42</td>
<td>0.24</td>
</tr>
<tr>
<td>Yadav (yes=1)</td>
<td>0.60</td>
<td>0.49</td>
<td>0.60</td>
</tr>
<tr>
<td>Tharu (yes=1)</td>
<td>0.11</td>
<td>0.32</td>
<td>0.05</td>
</tr>
<tr>
<td>Muslim (yes=1)</td>
<td>0.03</td>
<td>0.18</td>
<td>0.08</td>
</tr>
<tr>
<td>Other caste (yes=1)</td>
<td>0.03</td>
<td>0.16</td>
<td>0.03</td>
</tr>
<tr>
<td>Land owned (katha)</td>
<td>75.03</td>
<td>78.61</td>
<td>56.90</td>
</tr>
<tr>
<td>Cattle/buffalo (#)</td>
<td>2.17</td>
<td>2.17</td>
<td>2.19</td>
</tr>
<tr>
<td>Separate rooms (#)</td>
<td>5.10</td>
<td>1.97</td>
<td>4.65</td>
</tr>
<tr>
<td>Cooking fuel (firewood or dungcake=1)</td>
<td>0.71</td>
<td>0.45</td>
<td>0.81</td>
</tr>
<tr>
<td>No. of observations</td>
<td>303</td>
<td>205</td>
<td>148</td>
</tr>
</tbody>
</table>

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

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.

<table>
<thead>
<tr>
<th></th>
<th>Logarithm of diesel pump use (minutes per katha)</th>
<th>Nearest neighbor matching</th>
<th>Neighbor=1</th>
<th>Neighbor=3</th>
<th>Neighbor=5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kernel matching</td>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Monsoon paddy</td>
<td>Impact of SIPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of observations</td>
<td>-0.644*** (0.069)</td>
<td>-0.649*** (0.079)</td>
<td>-0.616*** (0.061)</td>
<td>-0.623*** (0.059)</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>Impact of SIPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of observations</td>
<td>-0.326*** (0.079)</td>
<td>-0.392*** (0.093)</td>
<td>-0.378*** (0.078)</td>
<td>-0.359*** (0.078)</td>
<td></td>
</tr>
</tbody>
</table>

Note: The results are robust to the sensitivity analysis.

Source: Household Survey, 2021

• **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)
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

Fig 1. Farmers who were allocated subsidized SIP by AEPC

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

Examples from SoLAR sites

<table>
<thead>
<tr>
<th>Land holding size</th>
<th>Owners of the plot irrigated</th>
<th>Sharecroppers of the plot irrigated</th>
<th>Leasers of the plot irrigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 bigha</td>
<td>28%</td>
<td>9%</td>
<td>60%</td>
</tr>
<tr>
<td>1-2 bigha</td>
<td>28%</td>
<td>8%</td>
<td>64%</td>
</tr>
<tr>
<td>2-4 bigha</td>
<td>30%</td>
<td>18%</td>
<td>52%</td>
</tr>
<tr>
<td>4-6 bigha</td>
<td>15%</td>
<td>13%</td>
<td>72%</td>
</tr>
<tr>
<td>&gt;6 bigha</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Do water, energy and agricultural (WEF) policies promote gender transformative approaches and interventions in South Asia?

SoLAR Project-SA
Gender continuum scale (Mullinax et al. 2018; Kabeer and Subrahmanian, 1996)

<table>
<thead>
<tr>
<th>Gender - blind</th>
<th>Gender- aware</th>
<th>Gender - responsive</th>
<th>Gender - transformative</th>
</tr>
</thead>
<tbody>
<tr>
<td>It implicitly focus on men’s needs, interests and priorities in opportunities and resources (Kabeer and Subrahmanian, 1996).</td>
<td>Gender is considered in policy or program or research, but incorporation into actual work processes very limited.</td>
<td>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.</td>
<td>Systemic /deep understanding of root causes behind inequalities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Policy or program or research leads to actual shift in gender relations, interpersonally and/or at a structural level.</td>
<td></td>
</tr>
</tbody>
</table>

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

Gender continuum scale of water, energy and agriculture development policies:
\( (gender \text{ blind}=0, \text{ gender aware}=1, \text{ gender responsive }=2, \text{ gender transformative }=3) \)

1.1 Promote equitable access to WEF resources, services and opportunities by women and disadvantaged groups

1.2 Efforts to address systemic barriers for change

2.1 Strengthen inclusion and voices of women and marginalized groups in WEF institutions and decision-making...

3.1 Ensure equality, justice and participation in the WEF sector through dedicated objectives, and strategies in...

3.2 Improve knowledge and capacity by strengthening social science and GESI perspectives

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 through role-play

Public awareness on equity, inclusion and sustainability issues of rural water supply
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.
IWMI representation in local, regional and global platforms, and evidence informed capacity development events
Building community resilience through inclusive water, sanitation and hygiene (WASH): A case of federal Nepal

IWMI: Manohara Khadka, Manita Raut
SNV: Anir Reza, Ratan Bahadur Budhathoki, Sunetra Lala
Water Aid: Bimshri Roy, Pramita Maharjan, Tripti Rai

https://www.youtube.com/watch?v=P0EuZcBOFnw&list=PLdx6IlpGvKB-WFA08baJoGUTEAmV27oM0
Briefing on One-CGIAR and its initiatives in Nepal
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

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 interdependencies
   - 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

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

Nexus Gains

Sustainable intensification of Mixed Farming System

SAVE the Date for the Nexus Gains Inception workshop
23 Chaitra/6th April 2022

Highland mixed ESA (Nepal)
Rice mixed SA (Bangladesh)
Upland mixed SEA (Laos)
Maize mixed ESA (Malawi)
Cereal-root mixed CWA (Ghana)
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
Thank you