Feed the Future Innovation Lab for Irrigation and Mechanization Systems

Semi Annual Report: October 1st, 2023 – March 31st, 2024

Submitted by the Robert B. Daugherty Water for Food Global Institute, University of Nebraska System, 30 April 2024

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## Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOI</td>
<td>Areas of Inquiry</td>
</tr>
<tr>
<td>AOR</td>
<td>Administrative Officer’s Representative</td>
</tr>
<tr>
<td>CCR</td>
<td>Cross-cutting Results</td>
</tr>
<tr>
<td>CNA</td>
<td>Capacity Needs Assessment</td>
</tr>
<tr>
<td>DWFI</td>
<td>Daugherty Water for Food Global Institute</td>
</tr>
<tr>
<td>EAC</td>
<td>External Advisory Committee</td>
</tr>
<tr>
<td>FTF</td>
<td>Feed the Future</td>
</tr>
<tr>
<td>GFSS</td>
<td>Global Food Security Strategy</td>
</tr>
<tr>
<td>HICD</td>
<td>Human and Institutional Capacity Development</td>
</tr>
<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
</tr>
<tr>
<td>ILIMS</td>
<td>Innovation Lab for Irrigation and Mechanization Systems</td>
</tr>
<tr>
<td>IR</td>
<td>Intermediate Results</td>
</tr>
<tr>
<td>ME</td>
<td>Management Entity</td>
</tr>
<tr>
<td>MERC</td>
<td>University of Nebraska – Lincoln Methodology and Evaluation Research Core</td>
</tr>
<tr>
<td>MPI</td>
<td>Mechanization Propensity Index</td>
</tr>
<tr>
<td>PCC</td>
<td>Program Coordinating Committee</td>
</tr>
<tr>
<td>ToC</td>
<td>Theory of Change</td>
</tr>
<tr>
<td>UM</td>
<td>University of Missouri – Columbia</td>
</tr>
<tr>
<td>UNL</td>
<td>University of Nebraska – Lincoln</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
</tbody>
</table>
Executive Summary

The Innovation Lab for Irrigation and Mechanization Systems is led by the Robert B. Daugherty Water for Food Global Institute of the University of Nebraska System under Cooperative Agreement No. 7200AA23LE00005. ILIMS aims to mobilize research that catalyzes increased use of irrigation and mechanization technologies and practices in an inclusive, economically, and environmentally sustainable way in Feed the Future countries. Target countries proposed in 2023 include: Ghana, Rwanda, Ethiopia, Nepal, Guatemala and Honduras. This report describes progress toward objectives between 1 October 2023 and 31 March 2024.

In the first six months of the project, the Management Entity (ME) was established, including hiring a Project Manager, completing a search process for Deputy Director, establishing a Project Coordinating Committee of university faculty, and forming a communications team. Initial Activities outlined in the proposal were reviewed; six proposals were submitted to USAID and two project sub-awards approved and fully executed with University of Missouri – Columbia (UM) and the International Food Policy Research Institute (IFPRI). The ME developed a monitoring and evaluation (M & E) plan approved by USAID and set up the reporting platform for sub-awards. A communications plan was completed; website, newsletter, and social media presence were established. In addition, the Director participated in various outreach activities, which included participation in workshops, Webinar presentations, meetings with Missions (Ghana), and engagement with other potential partners and stakeholders in Latin America, Rwanda, Niger, and Ethiopia.

During the next reporting period, the primary focus will be on issuing Requests for Proposals for sub-awards, starting the additional Initial Activities, on-boarding the External Advisory Committee, and various global and national outreach activities relevant to the Innovation Lab Areas of Inquiry.
1. Introduction

The Innovation Lab for Irrigation and Mechanization Systems is led by the Robert B. Daugherty Water for Food Global Institute of the University of Nebraska System under Cooperative Agreement No. 7200AA23LE00005. This report describes progress toward objectives between 1 October 2023 and 31 March 2024.

ILIMS aims to mobilize research that catalyzes increased use of irrigation and mechanization technologies and practices in an inclusive, economically, and environmentally sustainable way in Feed the Future countries. Target countries proposed in 2023 include: Ghana, Rwanda, Ethiopia, Nepal, Guatemala and Honduras.

As of March 31, 2024, program partners included two USAID-approved sub-award organizations: University of Missouri – Columbia (UM) and the International Food Policy Research Institute (IFPRI). Additional sub-awards are anticipated in Fiscal Year 2024 (FY2024). The complete list of U.S. based awards is in Annex 1.

2. Key Accomplishments

DWFI achieved most of the required actions for the first six months of the project. The Management Entity (ME) was established, including hire of the Project Manager (Anthony Delaney) and managing a search process and identification of the Deputy Director (expected to join June 1, 2024). The ME established the Project Coordinating Committee of university faculty and began steps toward setting up the External Advisory Committee. Initial Activities outlined in the proposal were reviewed with the AOR and six proposals submitted to USAID for approval; two project sub-awards were fully executed and four others continued to be under review by USAID. An on-boarding process and package of information was developed for all sub-awardees. The ME developed a monitoring and evaluation (M & E) plan with the Methodology and Evaluation Research Core Facility (MERC), which was approved by USAID. Subsequently, the ME contracted with Piestar and set up the reporting platform for sub-awards. A communications group was constituted within the DWFI communications team; a communications plan was developed and the project website, social media, and newsletter established. The Director participated in various outreach activities. Toward strengthening relationships and ensuring research relevance, the Director made one visit to Ghana (February) to meet potential partners and engage stakeholders, while other meetings were held remotely with stakeholders in Latin America, Rwanda, Niger, and Ethiopia.

3. Research Program Overview and Structure

The technical lead for ILIMS is DWFI, while the project administration is supported by the University of Nebraska-Lincoln (UNL) Project Management Office (PMO) located in the Prem S. Paul Research Center. ILIMS is led by a Director (Nicole Lefore) and Deputy Director (identified during reporting period). To ensure accountability and scientific validity, two advisory committees provide scientific guidance, being the Project Coordinating Committee made up of University of Nebraska faculty and an External Advisory Committee comprised of experts in relevant subjects across the target regions. The project aims toward five development objectives (outcomes):
2. Strengthened, inclusive natural resource governance and improved climate adaptation, mitigation, and resilience capacities.
3. Strengthened and inclusive market and finance ecosystems for irrigation and mechanized technology systems with reduced inequalities in access to mechanization and irrigation technologies and services.
4. Strengthened stakeholder capacity throughout the market system to manage trade-offs and sustain natural resources.
5. Improved health, equity, and nutrition security through protected water and diets in mechanization and irrigation interventions.

4. Theory of Change and Impact Pathway

The initial Theory of Change indicates that: If options of small-scale irrigation, Water Resource Management, and mechanization technologies can be targeted to match specific biophysical, climatic, and socio-economic conditions, including addressing the needs of women, youth and marginalized groups, and if the primary systems tradeoffs are identified and paired with technologies or approaches that overcome these barriers, then stakeholders will be able to better promote and adopt small-scale irrigation, WRM, and mechanization technologies that provide a pathway out of poverty and food insecurity.

The Theory of Change matrix showing the linkages between the project objectives and the Intermediate Results of the Global Food Security Strategy is in Annex 2. Impact pathways will be developed for each target country as sub-awards are developed.

5. Research Project Reports (by thematic area)


Project Name: Mechanization levels in Feed the Future (FTF) target geographies: Assessment and development of the Mechanization Propensity Index (MPI)

Project sub-awardee: International Food Policy Research Institute (IFPRI)

Location: Desk-based study (model) relevant to all countries

Collaborators: Local IFPRI offices in Feed the Future countries; CGIAR centers engaged in mechanization; Zamorano University

Description (summary): This activity analyses determinants of mechanization based on secondary household data in target geographies and develops a Mechanization Propensity Index (MPI) that supports identification of biophysically suitable locations for mechanization and irrigation; the MPI will incorporate some socioeconomic determinants of adoption.
Theory of Change and Impact Pathway/Logframe:

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Partners, Collaborators, Projects</th>
<th>Outputs</th>
<th>Assumptions</th>
<th>Outcomes (contribution to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary data</td>
<td>Agencies related to mechanized agriculture, including irrigation; universities, CG Centers, others in project countries</td>
<td>MPI</td>
<td>Access to suitable datasets for target countries. Key actors have interest to engage and incentive to apply the tool.</td>
<td>Context-suitable socio-economic, institutional, and technological interventions effectively target and reduce risks for multiple producer types</td>
</tr>
<tr>
<td>Engagement of key actors</td>
<td></td>
<td>MPI</td>
<td>Access to suitable datasets for target countries. Key actors have interest to engage and incentive to apply the tool.</td>
<td>Context-suitable socio-economic, institutional, and technological interventions effectively target and reduce risks for multiple producer types</td>
</tr>
</tbody>
</table>

Achievements: Since the sub-award was approved on January 19th, 2024, IFPRI has reviewed secondary datasets relevant to Ethiopia, Nepal, Ghana, and Rwanda. Given the lack of data available in Central America on mechanization, IFPRI partnered with Zamorano University to collect data on Honduras and Guatemala. Over the reporting period, IFPRI made significant progress in data analysis and refinement of the MPI tool, using Ghana as a test case. A methodology for developing the MPI in Ghana has been finalized and implementation of the model is currently underway. Results from the secondary data regarding Ghana found that households with mechanization are richer and spend more money on food and household items (40%), are twice as likely to own livestock; households are largely male headed. Additionally, children in mechanized houses have better height compared to children their age in houses that are not mechanized. The data for Rwanda suggested that promoting private-sector innovations while focusing on the public good aspect of mechanization is the most promising way forward.

Capacity Building; Lessons Learned: Nothing to report.

Presentations and Publications: IFPRI is currently developing a paper on developing mechanization and adoption for areas in Feed the Future target countries.

5.2. Objective 2. Strengthened, inclusive natural resource governance and improved climate adaptation, mitigation, and resilience capacities.

Nothing to report.

5.3. Objective 3. Strengthened and inclusive market and finance ecosystems for irrigation and mechanized technology systems with reduced inequalities in access to mechanization and irrigation technologies and services.

Nothing to report.
5.4. **Objective 4. Strengthened stakeholder capacity throughout the market system to manage trade-offs and sustain natural resources.**

**Project Name:** Capacity needs assessment for Irrigation and mechanization adoption and sustainability

**Project sub-awardee:** University of Missouri - Columbia

**Location:** Ghana, Ethiopia, and Rwanda

**Collaborators:** XSyn (Ethiopia) [sub-sub includes ISRD (Ghana); Kilimo Trust (Rwanda)]

**Description (summary):** Through surveys and interviews, the activity will conduct a comprehensive Capacity Needs Assessment (CNA) for sustainable irrigation and mechanization. This assessment will delve into the skills, capabilities, and capacities required by both public and private sectors within irrigation and mechanization market systems towards fostering sustainable agricultural practices and enhancing productivity.

**Theory of Change and Impact Pathway/Logframe:**

<table>
<thead>
<tr>
<th>Inputs (e.g. data, stakeholder engagement)</th>
<th>Partners, Collaborators, Leveraged projects</th>
<th>Outputs</th>
<th>Assumptions</th>
<th>Outcomes (contribution to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary and secondary data; Stakeholder engagement</td>
<td>National agencies and departments with direct stake in irrigation and mechanization</td>
<td>Policy and program analysis report and recommendations</td>
<td>Public sector actors have an incentive to invest in programs to address human resource gaps</td>
<td>Strengthened and inclusive market and finance ecosystems for irrigation and mechanized technology systems with reduced inequalities in access.</td>
</tr>
<tr>
<td></td>
<td>Development partners investing in mechanization</td>
<td>Capacity needs assessment reports and recommendations</td>
<td>Private sector sees benefit from investing in skills development to increase market share</td>
<td>Youth and women actively participating in the use of irrigation technologies/equipment and provision of services along the irrigation value chain</td>
</tr>
<tr>
<td></td>
<td>Private companies expanding markets</td>
<td></td>
<td>Youth, women other groups are seeking jobs in development, fabrication, marketing, maintaining irrigation technologies and equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Natural resource management agencies or departments responsible for water and/or land (soils)</td>
<td></td>
<td>Public sector has interest in science-based monitoring and planning of water and land</td>
<td>Youth and women actively participating in the use of irrigation technologies/equipment and provision of services along the irrigation value chain</td>
</tr>
</tbody>
</table>

**Achievements:** UM-C contracted XSyn, a private firm in Ethiopia, to manage surveys and interviews across countries; key personnel were contracted by XSyn in Ghana (ISRD) and Rwanda (Kilimo Trust) to ensure deliverables. Data collection instruments were designed and tested, and data collection is underway.

**Capacity Building; Lessons Learned; Presentations and Publications:** Nothing to report.

University of Nebraska Semi-Annual Report FY2024:

Innovation Lab for Irrigation for Irrigation and Mechanization Systems
5.5. **Objective 5.** Improved health, equity, and nutrition security through protected water and diets in mechanization and irrigation interventions.

Nothing to report.

### 6. Associate Award Research Project Reports

Nothing to report.

### 7. Human and Institutional Capacity Development

DWFI began drafting an ILIMS specific student support and training program that will be aligned with the DWFI and Nebraska Water Center student support programs. No trainings were provide or students engaged during the reporting period.

### 8. Innovation Transfer and Scaling Partnerships

Nothing to report.

### 9. Environmental Management and Mitigation Plan

ILIMS received an exemption for the EMMP until field activities are introduced that may require such a plan.

### 10. Open Data Management Plan

No unique datasets were created in the reporting period.

### 11. Governance and Management Entity Activity

#### 11.1. Project guidance and accountability

- Organized Program Coordinating Committee and scheduled first meeting (April 2024)
- Outlined and short-listed members for the External Advisory Committee, which is expected to be established in June/July 2024.
- Provided monthly updates to the DWFI executive for upward reporting to the University of Nebraska leadership.

#### 11.2. Project management

##### 11.2.1. Establish and maintain the project management system

- Hired professional project manager (start date December 1, 2023)
- Identified ILIMS Deputy Director (start date June 1, 2024)
• Established the Program Coordinating Committee (see list of members in Annex 3)
• Developed M & E plan with the Methodology and Evaluation Research Core Facility (MERC) at University of Nebraska-Lincoln.
• Contracted Piestar and established reporting system for sub-awardees.

11.2.2. Manage sub-awards and contracts to implement activities
• Fully executed sub-awards to IFPRI and U of M to undertake Initial Activities as outlined in the 2023 proposal.
• Commissioned consultant to identify recent and on-going irrigation projects and relevant datasets in Guatemala and Honduras.
• Commissioned consultant to provide desk study support on Irrigation as a Service in East and Southern Africa.

11.2.3. Report accurately and on time
• Established project and provided quarterly updates in FTF Activity Tracker.

11.2.4. Develop new funding proposals
• Submitted concept note to Niger USAID Mission for buy-in
• Submitted concept note to Bill and Melinda Gates Foundation for a project focused on Irrigation as a Service that will complement and leverage ILIMS

11.3. Communications and outreach

11.3.1. Communications
• ILIMS formalized and structured support from the DWFI communications team; three team members are assigned partial FTE to undertake specific roles for ILIMS.
• Developed Strategic Communications Plan
• Developed project webpage: https://waterforfood.nebraska.edu/irrigandmech
• Developed newsletter template: https://myemail-api.constantcontact.com/ILIMS-Quarterly-Update--April.html?soid=1115209281618&aid=SgGE4iVXzi0
• Established social media presence:
  LinkedIn - https://www.linkedin.com/showcase/feed-the-future-irrigation-and-mechanization-lab/
  Facebook: https://www.facebook.com/IrrigationAndMechanizationLab
  Twitter: @Irrig_MechLab
  - Followers: 123
  - Posts: 8
  - Impressions: 2,698
  - Clicks: 125
  - Reactions: 56
  - Reposts: 21

11.3.2. Outreach
• ILIMS Director presented during Agrilinks webinar for Water in Agriculture month (31 January 2024)
• ILIMS Director joined an IFC-IFAD webinar on the Handbook for Scaling Irrigation Systems, presenting her chapter on financing irrigation investments (8 February 2024).
11.3.3. Engagement

- U.S. Senator - Nebraska Pete Ricketts engaged with USAID Assistant to the Administrator Dina Esposito during a Senate hearing, noting ILIMS’s ability to contribute to global food security by leveraging DWFI’s expertise in irrigation and water management (March 6); this initiated discussion between USAID and the U.S./Nebraska irrigation industry. [https://www.foreign.senate.gov/hearings/global-food-security](https://www.foreign.senate.gov/hearings/global-food-security)
- ILIMS Director participated in two invited workshops on sustainable intensification and the bio-circular economy.

12. Issues

The process of generating the sub-awards through the Office of Sponsored Programs (OSP) was initially slow; a clear communication pipeline between the ME and OSP has been properly established for processing sub-awards. The resulting process reduced time to generate a draft subaward from an average of 40 days to about one business week. This has helped to ensure that once sub-award approval is received from USAID, University of Nebraska is able to execute the agreements in a timely manner.

13. Future Directions

The ME will continue to ensure effective project management. This includes on-boarding of the Deputy Director and establishment of the External Advisory Committee. In addition, the ME will submit the annual workplan and budget for fiscal year 2025.

The primary activity for the next reporting period is to publish Requests for Proposals. The ME has begun background research and stakeholder engagement related to content; the process is being supported by the PCC. The anticipated timeline is to release the RFPs beginning in/around July/August 2024, questions and informational meetings in August/September, and final submission deadlines by end of September 2024.

In addition, if approved, sub-awards for initial activities will begin, including:

- TetraTech: Carbon credits and innovative finance for irrigation
- Catholic Relief Services: Scoping study and capacity needs assessment, Honduras and Guatemala, with CIMMYT and CIAT.
- International Water Management Institute: Assess rainfed to supplemental and dry season water management practices and farmer incentives to change/adopt practices across three agro-ecological zones.

To ensure continuity in communications, two newsletters will be issued (April and July 2024) and podcasts and blogs published. Outreach will include the Director’s leadership in the World Water Forum (“Agricultural water management: Technologies, practices, and outreach to support smallholder farmers in the Global South”, 23 May 2024, Bali, Indonesia) and Stockholm World Water Week (Seminar Series: “Can Water for Food Help Peaceful Outcomes?”, August 2024, Stockholm, Sweden). The Director and Deputy Director will also hold virtual and in-person meetings with USAID Missions and stakeholders in target project countries and attend the Africa Food Systems Forum in Rwanda (September 2024). (See Annex 4 Planned International Travel.)
## Annex 1. List of awards given to U.S. partners

<table>
<thead>
<tr>
<th>Organization</th>
<th>Project name</th>
<th>Dates</th>
<th>Funding (current: total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Food Policy Research Institute</td>
<td>Mechanization levels in Feed the Future (FTF) target geographies: Assessment and development of the Mechanization Propensity Index (MPI)</td>
<td>January 19, 2024 - September 30, 2024</td>
<td>$250,712: $250,712</td>
</tr>
<tr>
<td>University of Missouri – Columbia</td>
<td>Capacity needs assessment for Irrigation and mechanization adoption and sustainability</td>
<td>January 19, 2024 - September 30, 2024</td>
<td>$146,530; $146,530</td>
</tr>
</tbody>
</table>
### Annex 2. ILIMS Theory of Change Matrix

<table>
<thead>
<tr>
<th>Objective 1: Inclusive and sustainable agriculture-led economic growth,</th>
<th>Objective 2: Strengthened resilience among people and systems.</th>
<th>Objective 3: A well-nourished population especially among women and children</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR 1 Strengthened inclusive agriculture systems that are productive and profitable</td>
<td>IR 2 Strengthened and expanded access to markets and trade</td>
<td>IR 3 Increased employment and entrepreneurship</td>
</tr>
<tr>
<td>IR 4 Increased sustainable productivity, particularly through climate-smart approaches</td>
<td>IR 5 Improved proactive risk reduction, mitigation, and management</td>
<td>IR 6 Improved adaptation to and recovery from shocks and stresses</td>
</tr>
<tr>
<td>IR 7 Increased consumption of safe and nutritious foods</td>
<td>IR 8 Improved natural resource management</td>
<td>IR 9 More hygienic household and community environments</td>
</tr>
<tr>
<td>IR 10 Improved water resources management</td>
<td>IR 10 Enhanced integration of digital technologies</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CC IR 1</th>
<th>CC IR 2</th>
<th>CC IR 3</th>
<th>CC IR 4</th>
<th>CC IR 5</th>
<th>CC IR 6</th>
<th>CC IR 7</th>
<th>CC IR 8</th>
<th>CC IR 9</th>
<th>CC IR 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased gender equality and female empowerment</td>
<td>Increased youth empowerment and livelihoods</td>
<td>Increased gender equality and female empowerment</td>
<td>Enhanced climate change adaptation and mitigation</td>
<td>Improved natural resource management</td>
<td>Improved water resources management</td>
<td>More effective governance, policy, and institutions</td>
<td>Improved human, organization, and system performance</td>
<td>Enhanced integration of conflict sensitivity, peace-building, and social cohesion</td>
<td>Enhanced integration of digital technologies</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome 1: Context-suitable socio-economic, institutional and technological interventions that effectively target and reduce risks for multiple producer types</td>
<td>Outcome 2: Strengthened, inclusive natural resource governance and improved climate adaptation, mitigation and resilience capacities</td>
<td>Outcome 3: Strengthened and inclusive market and finance ecosystems for irrigation and mechanized technology systems with reduced inequalities in access.</td>
<td>Outcome 4: Strengthened stakeholder capacity throughout the market system to manage trade-offs and sustain natural resources</td>
<td>Outcome 5: Improved health, equity and nutrition security through protected water and diets in mechanization and irrigation interventions</td>
</tr>
<tr>
<td>Area of Inquiry 1</td>
<td>Area of Inquiry 2</td>
<td>Area of Inquiry 3</td>
<td>Area of Inquiry 4</td>
<td>Area of Inquiry 5</td>
</tr>
<tr>
<td>------------------</td>
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<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Develop suitable socio-technical innovation bundles that address the needs of specific producer types/segments, including women, youth and vulnerable people</td>
<td>Establish and strengthen institutions for natural resource governance and climate resilience</td>
<td>Support to more inclusive market systems that enable scaling of profitable use of irrigation and mechanization</td>
<td>Develop human resource capacity that supports mechanization and irrigation system resilience</td>
<td>Formulate strategies for nutrition-sensitive mechanization and irrigation that safeguard and enhance health and inclusivity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EG.3-1: No. of households benefiting</th>
<th>EG.3.1-12: No. of agriculture and nutrition policies</th>
<th>EG.3.1-14: Value of new USG commitments and private sector investment leveraged</th>
<th>EG.3.2-1: Short-term Training Module</th>
<th>EG.3.1-12: No. of agriculture and nutrition policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>EG.3.2-7: Technologies &amp; Management Practices</td>
<td>EG.3.2-x41: No. of water resources sustainability assessments</td>
<td>EG.3.2-27: Value of agriculture-related financing accessed</td>
<td>EG.3.2-1: Short-term Training Module</td>
<td>EG.3.2-x41: No. of water resources sustainability assessments</td>
</tr>
<tr>
<td>CBLD 9: No. of local organizations showing increased performance</td>
<td>YOUTH-3</td>
<td>GNDR-2 STIR 12: Publications</td>
<td>EG.3.2-7: Technologies &amp; Management Practices</td>
<td>YOUTH-3</td>
</tr>
<tr>
<td>STIR 12: Publications</td>
<td>YOUTH-3</td>
<td>GNDR-2</td>
<td>YOUTH-3</td>
<td>GNDR-2</td>
</tr>
</tbody>
</table>
Annex 3. Program Coordinating Committee

- Martha Mamo (mmamo3@unl.edu) - Department Head, John E. Weaver Professor of Agronomy and Horticulture, Agronomy
- Steve Shultz (sshultz@unomaha.edu) - Professor of Real Estate and Land Use Economics, College of Business Administration (Omaha)
- Tirthankar Roy (roy@unl.edu) - Assistant Professor, Civil & Environmental Engineering (Omaha)
- Erin Haacker (haacker@unl.edu) - Assistant Professor, Earth & Atmospheric Sciences
- Derek Heeren (derek.heeren@unl.edu) - Associate Professor and Irrigation Engineer, Biological Systems Engineering
- Santosh Pitla (spitla2@unl.edu) - Associate Professor, Advanced machinery systems, Biological Systems Engineering
- Laurie Miller (lmiller29@unl.edu) - Associate Dean, College of Business
- Lia Nogueira-Rodriguez (lia.nogueira@unl.edu) - Associate Professor, Ag Econ
- Tala Awada (tawada2@unl.edu) - Physiological Plant Ecologist; Agricultural Research Division Associate Dean, School Natural Resources
- Jesse Bell (jesse.bell@unmc.edu) - Professor of Health and Environment, UNMC
Annex 4. Planned international travel for 1 April to 30 September

<table>
<thead>
<tr>
<th>Dates</th>
<th>Traveler</th>
<th>Location</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>23 May 2024</td>
<td>Director</td>
<td>Bali, Indonesia</td>
<td>World Water Forum (&quot;Agricultural water management: Technologies, practices, and outreach to support smallholder farmers in the Global South&quot;)</td>
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<tr>
<td></td>
<td>Deputy Director</td>
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<tr>
<td>July 2024</td>
<td>Director</td>
<td>Rwanda</td>
<td>Country/field visit</td>
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<tr>
<td>2-6 September 2024</td>
<td>Director</td>
<td></td>
<td>Africa Food Systems Forum in Rwanda</td>
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<td>TBD</td>
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