Innovation Norway

ENGINEERS WITHOUT BORDER NORWAY

FIELD READY FOR HUMANITARIAN INNOVATION الابتكار الإنساني في الميدان

RESPONSE INNOVATION LAB

World Vision

RISE SYRIA

Challenge Mapping and User Needs Analysis Report

Project background

RISE Syria aims to strengthen the resilience of wheat farmers in Northwest Syria through practical, climate-smart irrigation approaches that improve water-use efficiency while supporting agricultural productivity and long-term sustainability.

RISE Syria is implemented through a partnership between Engineers Without Borders Norway (EWB-N), Field Ready in Syria, World Vision Syria Response (WVSR), and the Response Innovation Lab (RIL), with financial support from Innovation Norway.

The objective is not simply introducing new technology. The objective is identifying solutions that are practical, affordable, locally maintainable, and capable of supporting farmers under increasingly difficult climatic and economic conditions.

CHALLENGE MAPPING WORKSHOP PARTICIPATION

The Challenge Mapping Workshop brought together a diverse group of stakeholders representing humanitarian and development actors, agricultural research institutions, the private sector, and community structures.

Participants included representatives from international and local humanitarian organizations working in food security, livelihoods, agriculture, and resilience programming; researchers and technical experts from agricultural research institutions; a private sector actor with relevant engineering and technical expertise; and community committee representatives reflecting local perspectives.

This diversity helped ensure that the discussion captured technical, operational, community-based, and market-oriented perspectives, strengthening the relevance of the findings for future solution design and market dialogue under the RISE Syria project.

Structured innovation process

Needs Assessment → **Challenge Mapping** → **Market Dialogue** → **Human-Centered Design** → **Solution Development & Validation**

METHODOLOGY - HUMAN-CENTERED DESIGN

The project adopted a Human-Centered Design approach combining Needs Assessment, Challenge Mapping Workshop, and Technical Dialogue Session.

- Current irrigation practices
- Water-use patterns
- Farmer behaviors
- Existing barriers
- Adoption readiness

CHALLENGE MAPPING FOCUS

- Problem framing
- Root cause analysis
- Stakeholder mapping
- Prioritization exercises
- Identification of design requirements

Technical Dialogue included farmers, researchers, irrigation experts, academia, humanitarian actors, and technical specialists.

Context and problem statement

Northwest Syria faces increasing agricultural pressure resulting from climate variability and prolonged drought, irregular rainfall distribution, declining groundwater availability, increasing irrigation and energy costs, weak agricultural extension systems, limited technical support, high production costs, and weak farmer purchasing power.

Wheat remains the cornerstone of food security and household livelihoods across Northwest Syria. Smallholder farmers depend heavily on wheat production while simultaneously facing growing pressure on increasingly limited water resources.

The challenge extends beyond water scarcity itself.

Farmers face interconnected environmental, technical, behavioral, institutional, and economic constraints that directly influence irrigation decisions and reduce agricultural resilience.

User profile and farming context

PRODUCTION CONTEXT

Main cultivated crops are wheat and barley. These crops are preferred because they are considered lower-risk livelihood crops.

FARMER CHARACTERISTICS

Long agricultural experience, heavy reliance on personal experience, limited cooperative participation, limited technical support access, and preference toward practical solutions.

SMALLHOLDER ECONOMIC VULNERABILITY

- Most farming households rely heavily on agriculture.
- Agricultural income is often insufficient.
- Farmers face increasing fuel and pumping costs.
- Financial resources remain highly constrained.

Participation readiness

91%
willing to participate without conditions

9%
willing to participate with conditions

60%
willing to support data collection directly

25%
willing with enumerator support

A critical finding emerged: trust and adoption strongly depend on experienced and technically qualified project teams.

Design implication: solutions must be practical, locally understandable, and introduced through trusted technical teams rather than as stand-alone technologies.

Current irrigation reality

EXISTING IRRIGATION PRACTICES

Rainfed	34%
Furrow	28%
Sprinkler	25%

EXISTING WATER SOURCES

Rainwater	36%
Canals / streams	26%
Solar wells	25%

IRRIGATION DECISION MAKING

89%

of respondents rely primarily on personal experience when deciding when to irrigate and how much to irrigate.

Formal irrigation decision-support systems remain largely absent.

Participants repeatedly emphasized: "Farmers irrigate when water becomes available - not necessarily when crops need irrigation."

Climate context

CLIMATE CHANGE IS NOT SIMPLY REDUCED RAINFALL

The greater challenge is increasing climate variability: delayed rainfall seasons, interrupted rainfall periods, uneven rainfall distribution, and severe seasonal fluctuations.

RESILIENCE REQUIREMENT

Even wetter seasons may indicate climate instability rather than recovery. Future solutions must improve resilience under dry seasons, wet seasons, and variable seasons.

Core design implication: the strongest opportunity is not only increasing irrigation capacity, but improving the quality and timing of irrigation decisions.

Root cause analysis

Core problem: limited farmer capacity to make reliable irrigation decisions.

Current irrigation decisions frequently depend on personal experience, inherited farming practices, and neighbor recommendations rather than technical guidance, field indicators, practical irrigation tools, or reliable advisory systems.

Environmental
- Water scarcity
- Groundwater depletion
- Climate variability

Technical
- Weak irrigation infrastructure
- Limited decision-support tools
- Weak access to data

Economic
- High irrigation costs
- Weak purchasing power
- High production expenses

Institutional
- Weak agricultural extension
- Weak coordination mechanisms
- Limited follow-up systems

Behavioral
- Limited trust in technical recommendations
- Resistance to unproven technologies
- Preference toward familiar practices

Critical findings for solution design

NOT PRIMARILY

Irrigation technology itself

THE STRONGER DESIGN CHALLENGE

Helping farmers determine when to irrigate and how much to irrigate.

Design requirements emerging from evidence

TECHNICAL
- Data-informed
- Locally maintainable
- Flexible across irrigation systems
- Low infrastructure dependency

USER-CENTERED
- Simple
- Practical
- Affordable
- Easy to understand

SUSTAINABILITY
- Economically feasible
- Scalable
- Locally serviceable

ADOPTION
- Demonstration-based
- Field-tested
- Supported by practical guidance

The project therefore shifts from “How can farmers irrigate more?” toward “How can farmers produce more wheat using less water?”

Technology alone will not drive adoption. Trust, simplicity, and practical validation are equally important.

Social inclusion findings

WOMEN

Women actively participate in farming activities. However, their role in agricultural decision-making remains limited.

PERSONS WITH DISABILITIES

Persons with disabilities participate in farming activities but experience practical barriers.

Future solutions should prioritize accessibility, inclusive communication, and practical usability.

Initial innovation direction

PRACTICAL IRRIGATION DECISION SUPPORT

Evidence suggests RISE Syria should not prioritize expensive irrigation hardware alone. The strongest innovation direction emerging from findings is practical irrigation decision support.

Produce more wheat with less water.

Potential solution areas

IRRIGATION GUIDANCE

- Irrigation timing guidance
- Irrigation quantity recommendations

FIELD INDICATORS

- Practical field indicators
- Simple soil moisture indicators

FARMER ADVISORY

- Farmer reference systems
- SMS / WhatsApp advisory approaches

EXTENSION SUPPORT

- Field-based extension support
- Climate-informed advisory mechanisms

Market dialogue priorities

PRIVATE SECTOR

Availability of affordable solutions, local maintenance capacity, and local supply chains.

FARMERS

Adoption preferences, ease of use, and practical constraints.

TECHNICAL ACTORS

Appropriate indicators and operational feasibility.

FINANCIAL CONSIDERATIONS

Affordability thresholds and sustainability models.

Evidence direction: prioritize practical decision support rather than expensive irrigation hardware alone.

Next steps

1

TRANSLATE EVIDENCE

Translate findings into technical specifications and define innovation requirements.

2

CONDUCT MARKET DIALOGUE

Conduct Market Dialogue activities, develop solution concepts, and complete feasibility analysis.

3

PILOT AND VALIDATE

Explore piloting opportunities, validation, and field testing through a continued Human-Centered Design process.

PROCESS CONTINUITY

The process will continue applying Human-Centered Design principles to ensure future solutions remain practical, scalable, affordable, and responsive to farmer realities.

Final conclusion

The evidence generated through the Needs Assessment, Challenge Mapping Workshop, and Technical Dialogue confirms that improving irrigation resilience in Northwest Syria requires more than introducing technology.

Future solutions must strengthen farmer decision-making capacity, improve practical guidance systems, increase water productivity, and remain compatible with local agricultural realities.

The future of resilient agriculture depends not only on saving water. It depends on helping farmers use every millimeter of water more effectively.