

# Challenges of farming systems design in the drylands of Africa and Asia

*Cases of CLCA (IFAD) and PROSOL (GIZ) projects in Tunisia/Algeria*

**By**  
**Aymen Frija (ICARDA, Tunis office)**

*FSD7-2022*  
*30<sup>th</sup> Oct. to 3<sup>rd</sup> Nov. 2022*

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# CL-CA (Crop livestock integration under conservation agriculture)

Crop-Livestock Systems Transformation for more Sustainable Resources Use

**Funded by:** IFAD (implemented by ICARDA, CIMMYT and their partners)

**Countries:** Mexico, Bolivia, Algeria, [Tunisia](#)



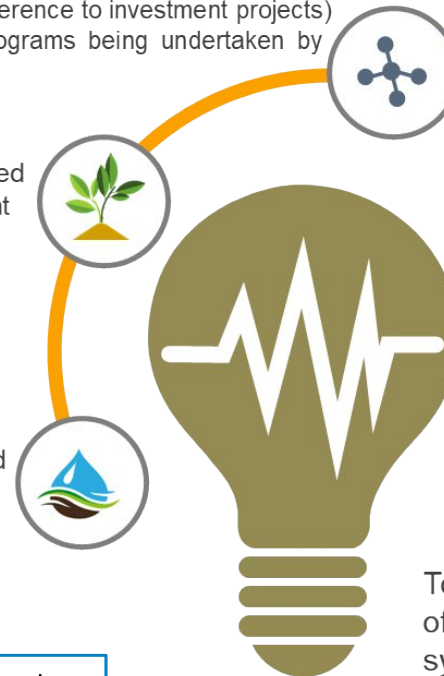
# CLCA Project (R4D and scaling project)

OBJECTIVE

To develop local adaptable soil conservation and water use efficiency technologies as well as forage crops and biomass management practices for different CLCA systems in the drylands using agro-ecological principles and participatory action research approaches.

GOAL

To sustainably increase production and enhance climate resilience of small farmers' communities and their crop-livestock production systems in drylands.



Linking with and leveraging existing or upcoming IFAD projects (reference to investment projects) within the countries of engagement as well as developmental programs being undertaken by national governments or multilateral and international organizations

Introduction of more productive forage crops and enhanced practices for biomass management and livestock management

Development of contextually-relevant soil conservation and water use efficiency practices



## Target numbers

The direct target group will be an estimated 3,000 (at least 50% women and 30% youth (below 35 years)) small crop-livestock farmers in drylands in LAC and NA participating in trials, action research, training and extension for the development and adoption of local adapted technologies and practices for CLCA systems;

Through the IFAD investment projects and project partners it is estimated that the training and adoption of technologies and practices for CLCA systems will reach an additional 10,000 small crop-livestock farmers;

In North Africa and over the four years, the grant will aim to target directly and indirectly 2,000 mixed cereal-sheep farmers whose farming practices stretch to over 50,000 – 60,000 ha.

### Outcome 1)

2,100 (70% of beneficiaries) farmers have adopted CLCA farming systems with increased production and improved cost-benefits compared to conventional systems;

### Outcome 2)

Locally adapted guidelines for CLCA technologies and practices are used by at least 8 participating NARES and IFAD investment project partners in their advisory services or promoted in their outreach to private input and service providers;

### Outcome 3)

At least 4 effective agricultural innovation systems - 1 in each implementation area of the 4 target countries - are coalesced in order to foster broad uptake of conservation agriculture practices within integrated semi arid crop-livestock production systems.

Project Outcomes

# CLCA Socio-Technical Package for Agroecological System Transformation

## NA Countries

Clustering Crop-Livestock Integration (CLI) Options Based on the Scale of Implementation (On-Farm, Landscape) and Resource-Orientations.

### CLCA Options

No-till on Residues + Forage Diversification+ Livestock Management Interventions

Minimum Tillage+ Forage Diversification+ Alternative Feed Options + Livestock Management Interventions

Conventional Till + Forage Diversification+ Forage Crops Seed Production + Small-Scale Mechanization of feed production

Minimum Tillage + Forage Diversification+ Alternative Feed Options

Cereal-Food Legumes Rotation + No-till on residues + Stubble Grazing Management

### Phase-I: Adaptative Research & Options under Piloting

### Phase-II: Scaling-Up Full CLCA Packages

Knowledge  
Hubs

Forage Diversification to Address Feeding Gap  
Minimizing Soil Disturbance

Forage Diversification to Address Feeding Gap  
Minimizing soil Disturbance and Improving Herd Management

Conventional forage cropping for biomass and seeds and community-based mechanization for feed production

Forage Diversification to Address Feeding Gap  
Minimizing Soil Disturbance

CA in Cereal-Legume Based Systems

CLCA Package/Context

## LAC Countries

### Landscape-Piloting Stage

#### Mexico

- ✓ Living Barriers
- ✓ Controlled Grazing of Stubble and Forage Mixtures
- ✓ Relay Cropping with Fodders Species

#### Bolivia

- ✓ Improved Fallow
- ✓ Improved Pastures
- ✓ Windbreak with Quality Species



# Complement the innovations with KM and partnership approaches

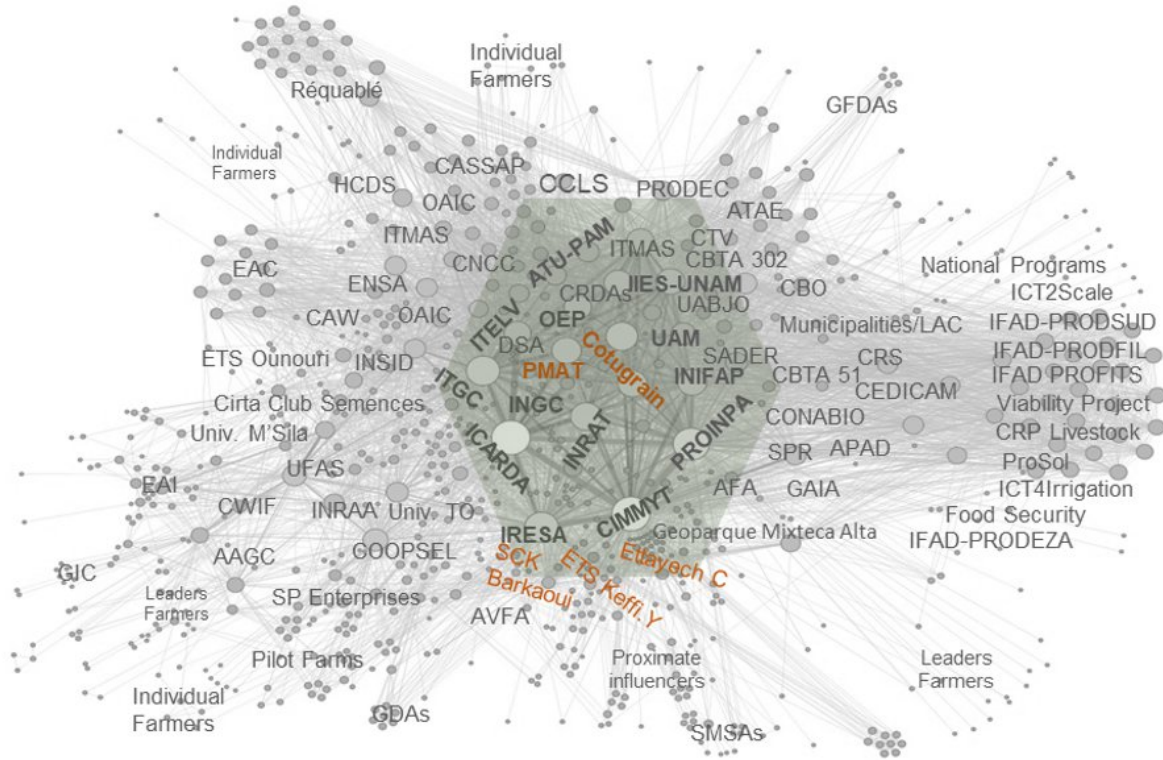
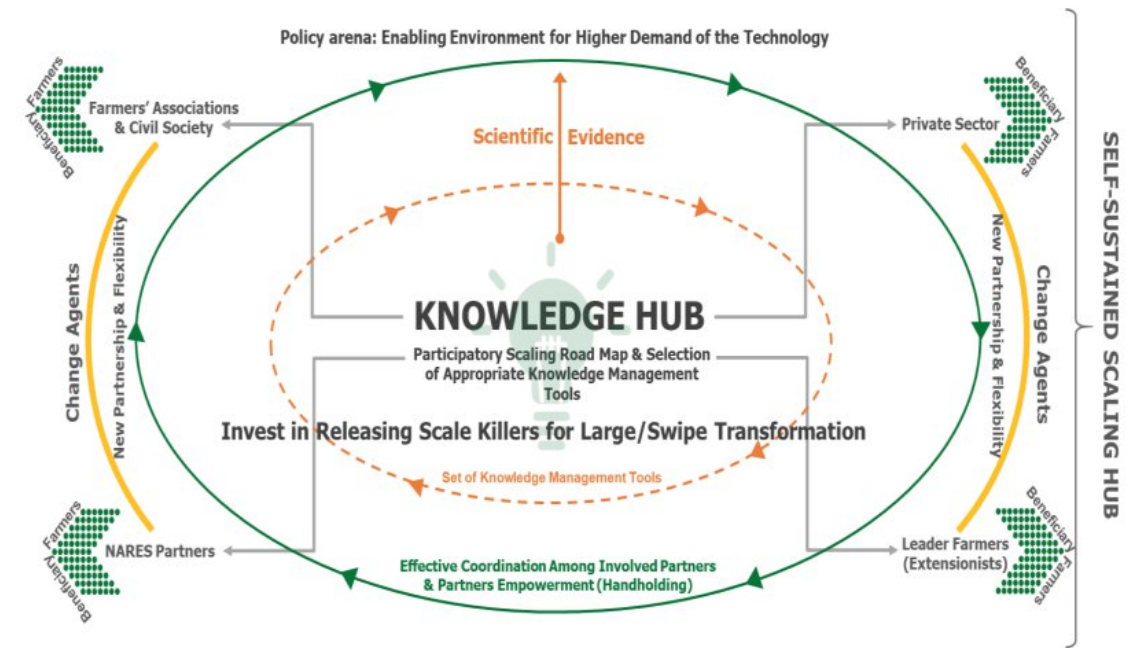


Figure 3. Partnership for Self-Sustained Scaling Hub – The “4-Wheels Approach”



# Engage Effective Partnership & Deliver at Scale

# 1,200

5,600

Gender Based-Interventions for Innovative Solutions in NA  
reaching out 1200 women farmers

## Dissemination of the Integrated Improved Crop-Livestock Management Packages to 5,600 Mixed, Smallholder Farmers in NA and LAC Countries

20,000

Farmers are indirectly reached through broader CLCA initiatives

6,000

Hectares were Implemented under CLCA Farming Systems in NA and LAC Countries

125\$

A cost per beneficiary ratio of US\$125 compared to the average of US\$246 in IFAD's 2016-2018 portfolio.

5,000

knowledge Provision & Capacity Lifting to more than 5,000 Farmers, National and Local Extension Agents, Students, Young Scientists, and Policy Makers – in NA and LAC Countries

02

## Private Public Partnerships

05

Knowledge Hubs for Leveraging the democratization of knowledge and Communities Empowerment of Contextualized CLCA Systems (CA, Forage, Livestock) in Algeria and Tunisia

- ITGC – PMAT-CLCA in Algeria to Locally Produce Zero-till Seeders and Expand areas Under CA
- INRAT-Cotugrain-CLCA to scale forage crops and forage mixtures in Tunisia



# PROSOL

Soil Protection and Rehabilitation of Degraded Soil for Food Security

**Co-funded by:** European Union (EU), Bill & Melinda Gates Foundation (BMGF)

**Country:** Supraregional: Benin, Burkina Faso, Ethiopia, India, Kenya, Madagascar,  
Tunisia



# Towards the Effective Scaling of Soil and Water Conservation Technologies under different Agroecosystems in North and Central West Tunisia

Period of Implementation: December 2020 – March 2023

The **Project Goal** is to support the effective implementation of the ProSol program and provide guidance on the best scaling pathways of soil and water conservation practices through a set of research and “research for scaling” activities. The project is also expected to provide additional guidance to the **National ACTA 2050 Strategy**.

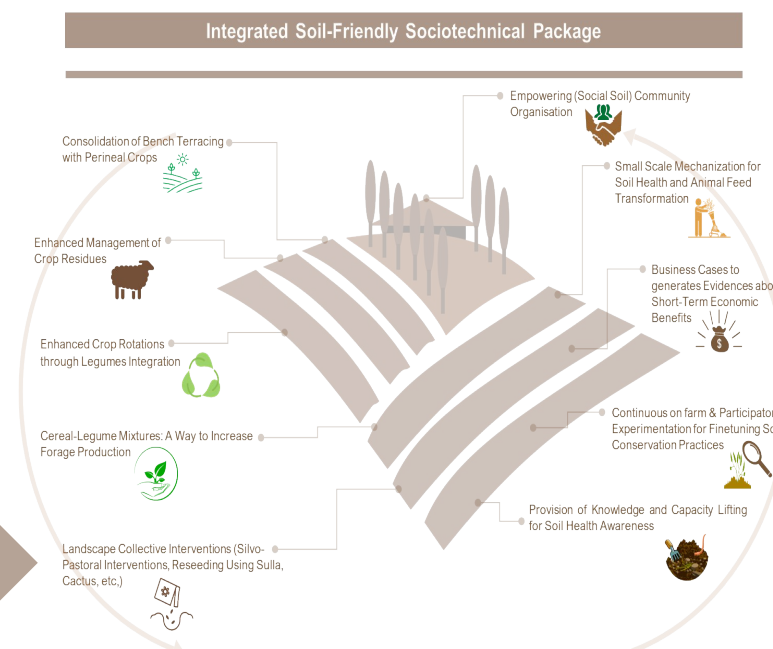


**Integrated soil friendly sociotechnical package**

## Project Innovation:

SWC@Scale project members designed an Integrated Soil-Friendly Sociotechnical Package well suited for mixed crop-livestock systems and implemented/scaled through local knowledge hubs to improve soil fertility in diverse farming agroecosystems in North (Cereal-based farming system) and Central West (Olive-livestock based farming system) Tunisia.

**Implementing two local Knowledge Hubs** for Self-Sustained Scaling of Soil Conservation and Fertility Restoration at Farm & Landscape Levels



## Expected Outputs

**750 farmers & 100 extension agents** (public and private) are directly reached through project activities until the end of the project.

**10,000** farmers are reached indirectly.

**30%** of the reached farmers have adopted the technology until the end of the project.

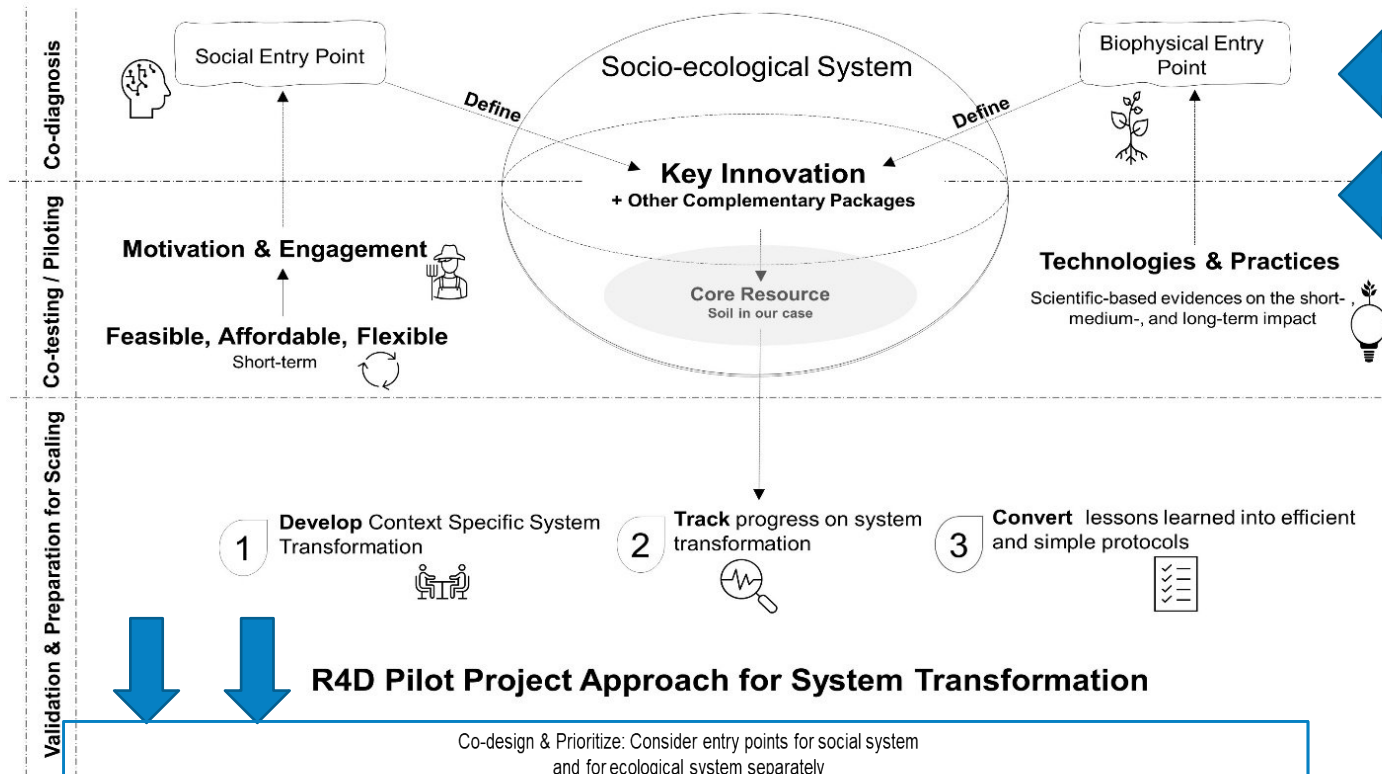
**35%** of beneficiaries are women and youth

**100** engineers and private leader farmers successfully followed the ICARDA/ProSol e-learning modules and get their online certificates.

**1,500** ha of degraded land will be restored.



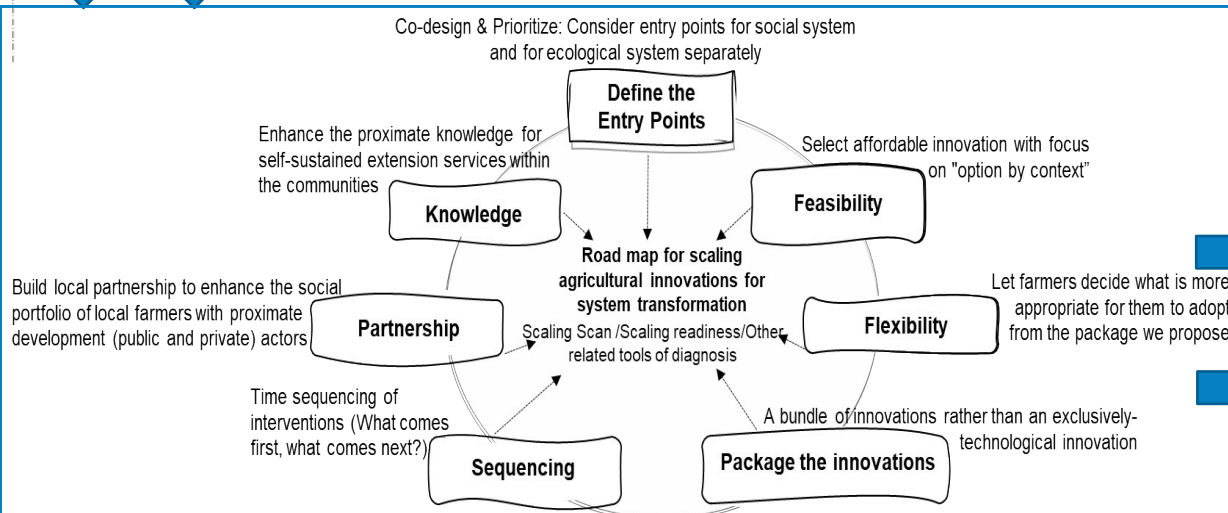
# PROSOL PROJECT (ICARDA-GIZ) - Approach: "Dual entry points" and criteria for the design of (context specific) soil friendly sociotechnical bundle of innovations



Development of three packaging criteria:

- ❖ Motivation and engagement of private farmers to the suggested innovations: this suggests that our practices and innovations need to be flexible, affordable, and feasible from farmers/stakeholders' perspective;
- ❖ The need for the suggested practices (to be bundled), to have positive (short or long term) environmental impacts;
- ❖ Innovations suggested as relevant for both entry points have to be meaningful and complementary once packaged together" (complement each other).

## R4D Pilot Project Approach for System Transformation



## Achievement of all project outputs 18 months & Early system transformation observed in sites

- ❖ Development of contract farming
- ❖ Increase of collective investments
- ❖ Increased trend towards commercial activities
- ❖ Increased awareness about environmental and soil health
- ❖ Increased exchange of information across communities
- ❖ Increase of women engagement and leadership

# Conclusions

- Started by promoting single pillars of “CA” when and if relevant to farmers,
- Focus on knowledge management approach and how to properly integrate them into R4D projects, (these are a very good support for scaling)
- Importance of packaging for systems transformation with PROSOL,
- And next, importance of packaging with an agroecological lens (do the same, but ensure that the resulting packages are aligned with “few or more” agroecological principles,