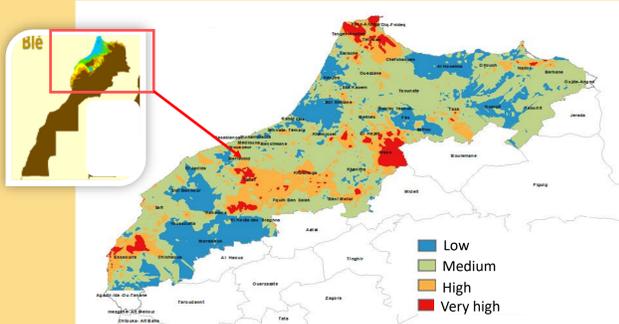


Rachid Moussadek, Mina Devkota and Vinay Nangia

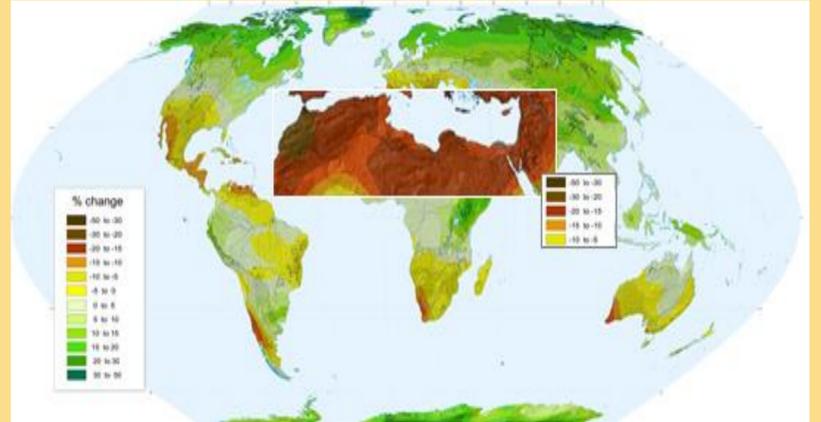
International Center for Agriculture Research in the Dry Areas (ICARDA), Rabat, Morocco

## Background

Crop yield in the rainfed Mediterranean environment in Morocco, the hot spot for climate change, is highly affected by rainfall variability, temperature extremes, and declining soil quality. Several research findings reported that Conservation agriculture (CA) has potential to minimize climatic risk, reduce soil erosion, and improve water use efficiency and soil health compared to conventionally tilled (CT) field in such climatic condition.



Map showing soil organic matter (SOM) content in major crop growing region, Morocco



According to recent IPCC report, in Morocco

- Rainfall will be reduced by 20%
- Temperature will be increased by +2 °C by 2050

In addition, degradation of agricultural land is alarming scale where 2/3 of these soils are threatened by erosion. The recent study on soil fertility in Morocco showed that >60% of 32,000 soil samples had >2% Soil organic matter (see SOM map)

## Conservation agriculture to address challenges

Decades of research conducted by ICARDA and the National Research team have demonstrated that CA can be an appropriate technology for adaptation to such climate change. It helps sustainably improving the productivity and range of agronomic, economic and soil fertility indicators in variable rainfed drylands. The table below resumes the main research results of long-term research comparing CA vs CT in different regions in Morocco.

| Indicators          | Components           | CT             | CA          | % change over CT |
|---------------------|----------------------|----------------|-------------|------------------|
| Grain yield (kg/ha) | Average yield        | 1300±700       | 1800±500    | + 30%            |
|                     | Yield (dry year)     | 0-600          | 1000-1200   | (+100%)          |
| Mitigation          | Carbon sequestration | < 1.5%         | > 2%        | (+33%)           |
| Adaptation          | Yield stability      | Less stable    | More stable | (+ stability)    |
|                     | Soil erosion         | High (30 t/ha) | Low         | (-50%)           |

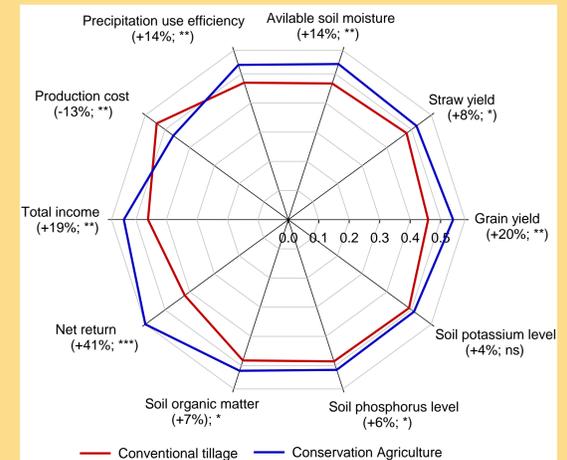


Figure: Trade-off among agronomic, economic and soil fertility indicators under five years of CA and CT system in Morocco

## Challenges for adoption at scaling

Besides several benefits of CA, its adoption is very low in the MENA region including Morocco, where > 1.5% of cultivated area is under CA. Challenges on easy availability of no-till seeder, bundling context specific technology packages and capacity development need to address.



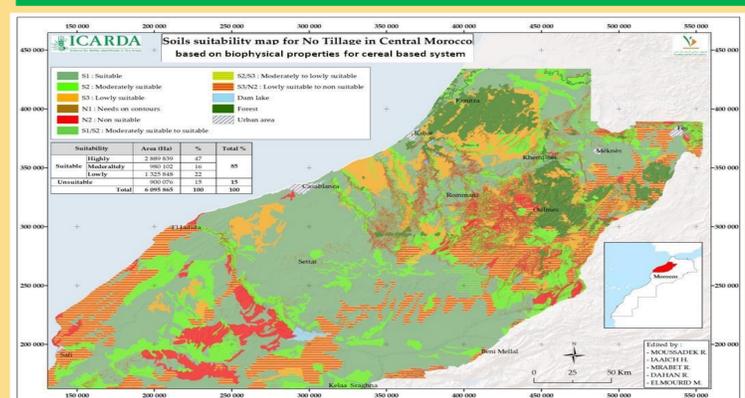
Low cost No-till seeders

## Opportunities for scaling out CA

Government of Morocco has planned to reach 1.0 M ha area under CA by 2030



Land suitability map for CA: based on the bio-physical environment, 63% of ~ 6.1 M ha are highly to moderately suitable to CA in Morocco



To support this initiative, ICARDA together with its partners, will:

- Reinforce a strategic R&D to improve spatially explicit CA recommendations in Morocco;
- Strengthen the skills in CA through capacity development activities; and
- Broaden the network of R&D partners by bringing together various CGIAR Centers, Advance Research Institutions, private sector, NGOs, others..