Background: Growing climate crisis, rapidly degenerating soils, extinction of Agro-biodiversity and highly volatile markets have raised stern fears for achieving the Sustainable Development Goals (SDGs) specially related to agriculture, when we have left with only 7 annual harvests to go. The anthropogenic climate change has already slowed down agricultural productivity growth by 21% in last 60 years. The agrifood systems supporting growing population are responsible for a 3rd of global anthropogenic GHG emissions and hence intensifying the climate crisis. The climate risks in recent past have been very frequent; leading to significant yield losses specially in the drylands. This has posed a serious threat to food & nutritional security and livelihoods of billions. Without long-term corrective measures, the challenge will further compound given the agrifood systems’ contribution of a third of global anthropogenic greenhouse gases and rapidly deteriorating soil health and drying aquifers.

Agrifood systems requires systemic solutions bundling climate-smart, regenerative and profitable innovations. Conservation Agriculture (CA) is an ecosystem approach to regenerative agriculture and land management systems based on three interlinked principles: (1) continuous minimum mechanical soil disturbance using no-till or reduced tillage based crop establishment, (2) maintenance of permanent soil cover using crop residues and cover crops and (3) diversification of cropping system using economically, environmentally and socially adapted rotations including legumes and cover crops coupled with other complementary good agronomic management practices. Globally, CA has been adopted on 205 million ha in 102 countries which is 15% of the world’s cropland area. In Argentina, Australia, Brazil, Canada, Paraguay, South Africa, Uruguay and the USA, CA methods are applied on more than half their cropped area. CA aims to achieve sustainable, resilient and profitable agriculture and subsequently leads to improved livelihoods of farmers through the application of three CA principles. Therefore, CA has emerged as an alternative to an inefficient tillage-based conventional agriculture. Numerous favourable impacts have been reported in the global literature on CA including for crop yields, resource (labor, water, energy) use efficiencies, timeliness of cropping practices, soil quality and ecosystem services. But, in drylands of Asia and Africa, CA is a relatively new introduction with low level of adoption. Hence, capacity development of stakeholders is vital for development, adaptation, refinement and scaling CA based technologies for impact at scale on smallholder farmers in these regions.

Thus, an International Training Course on Conservation Agriculture for Sustainable Intensification of Drylands shall offer unique capacity development opportunity to the scientific community associated with natural resource management research for development (NRMR4D) in the drylands.

Purpose: To impart training on modern in tools and techniques CA and testing to achieve sustainable, resilient & profitable agriculture.
**Expected Output:** Trained researchers with enhanced knowledge and skills in the use of new CA tools and techniques, including approaches to testing, generating good quality data, data management and selection decisions.

**Expected Outcome:** Enable agronomists, soil scientists, crop breeders to adopt modern tools and techniques in CA and testing programs for natural resource management research.

**Course Duration and Venue:** 21-days
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India, from 31 July to 18 August 2023.

**No of participants:** A total of 25 participants.

**Type of Training Materials Used:** The training course includes lectures, training materials (PDF and PowerPoint files), example data sets (Excel files) and modeling View software plus training license for hands-on practical sessions, visit to facilities and laboratories and field experiments.

**Course Content and/or Outline**
- Global Overview of Conservation Agriculture
- Water management in CA based systems: Concepts, Approaches and Lessons
- Small scale mechanization in South Asia - concepts, direct sowing machine operating and setup issues
- Recent Advances in Scale Appropriate CA Machinery
- Soil health and nutrient management
- Insect-pest and weed dynamics and management
- Genotypes for CA and seed systems
- Geospatial and modeling tools
- Scaling strategies and approaches

**Co-ordinators**

**ML Jat**
Global Research Program Director
Research Program - Resilient Farm & Food System
ICRISAT
mangilal.jat@icrisat.org

**Ramesh Singh**
Cluster Leader - ICRISAT Development Center
Research Program - Resilient Farm & Food System
ICRISAT
Ramesh.Singh@icrisat.org

**Contact person at ICRISAT**

**Padmaja Ravula**
Cluster Leader - Knowledge and Capacity Development
Research Program - Enabling Systems
Transformation, ICRISAT
padmaja.ravula@icrisat.org
for training logistics and other details

**Organized by**
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

**Target Training Audience**
Agronomists, soil scientists, hydrologists, natural resource scientists and crop breeders engaged in development and testing of innovative crop management practices will benefit from the training program.

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