



*First circular*

**International Conference**

*on*

**Reimagining Rainfed Agro-ecosystems:  
Challenges & Opportunities**

**22-24, December, 2022**

at

**ICAR-Central Research Institute for Dryland Agriculture  
Hyderabad, Telangana, India**

*Organised by*

**Indian Society of Dryland Agriculture  
ICAR- Central Research Institute for Dryland Agriculture**

*In collaboration with*

**Indian Council of Agricultural Research New Delhi**

### Background

Rainfed-drylands, as an important biome, occupy more than 41% of the world's land area and provide much of the world's food and fibre, further supporting biodiversity and providing ecosystem services (UNCCD, 2017). Climate change, which is expected to manifest as increased frequency and intensity of extreme climate events including droughts is particularly of concern in rainfed agroecosystems species and communities have to cope with extreme temperature and droughts. Climate change is a significant driver of land degradation in drylands. In some dryland areas, increased land surface air temperature, evapotranspiration and decreased precipitation amount, in interaction with climate variability and human activities, have contributed to desertification. Land degradation in drylands can also manifest itself through the loss of soil organic carbon (IUCN, 2015). The depletion of water, either as soil moisture, groundwater, flowing rivers or reservoirs, disrupts water cycles and leads to water scarcity (UNCCD, 2017). Water scarcity affects among other things the length of growing season.

Rainfed agriculture in India is practiced in diverse agro-ecologies covering about 48% of 142 million ha net sown area and contributes 40% of country's food basket and dominant producer in nutri-cereals, pulses, oilseeds, cotton, jute and allied fibres. Rainfed areas produce 84-87% of nutritious cereals and pulses, 77% of oilseeds, 60% of cotton etc. and thus immensely contribute country's economy. Rainfed regions support 60% of livestock, 40% of human population and contribute 40% of food grains and several special-attribute commodities such as seed spices, dyes, herbs, gums, etc. It is estimated that even after achieving the full irrigation potential, barring for successful completion of river linking project, nearly 45 to 50% of the total cultivated area will remain dependent on rain. Though rainfed area reduced to 48% of net cultivated area, it continues to play significant role in the livelihoods of the majority of the small & marginal farmers. Therefore, rainfed agriculture would continue to occupy a prominent place in Indian agriculture for a long time to come. Despite the progress made so far, rainfed agriculture in India still challenged by multiple risks and biophysical and socio-economic constraints. The agricultural production, productivity and stability in rainfed areas is more vulnerable to climate variability particularly during *kharif* due to its high dependency on south-west (SW) monsoon.

Droughts are the general features of rainfed agriculture globally, particularly in India. The risk involved in successful cultivation of crops depends on the nature of drought (chronic and contingent); probable duration, and periodicity of occurrence within the season. Coupled with edaphic constraints like poor water and nutrient retention capacity, low soil organic matter (SOM) make rainfed agriculture highly vulnerable and less resilient requiring a different

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outlook and strategy. Besides the three primary nutrients (NPK), secondary and micronutrient deficiencies limiting increase in food productivity. Further, high intense rainfall events across rainfed areas during the cropping season causing intermittent stagnation of water leading to decline in yields specially in vertisols of central and western part of India.

While climate change impacts agriculture sector in general, rainfed agriculture is likely to be more vulnerable in view of its high dependency on monsoon and the likelihood of increased extreme weather events with reduction in number of rainy days due to aberrant behaviour of south-west (SW) monsoon. Aberrations in SW monsoon which include delay in onset, long dry spells and early withdrawal, all of which affect the crops, are likely to further aggravate in future. Numerous technological (e.g. cropping patterns, crop diversification, soil health management, rainwater harvesting, shifts to drought/salt tolerant varieties etc.) and socio-economic (e.g. ownership of assets, access to services, infrastructural support etc.) factors will come into play in enhancing or constraining the current capacity of rainfed farmers to cope with climate change.

The gap between research station yields and farmers' fields are still wide but are expected to narrow down in the future. While evolving strategies for bridging yield gaps, due attention must be given to regional imbalances in terms of natural resources and technology intake capacity of farmers. Biofortification of rainfed crops, particularly millets would be the future challenge to ensure nutritional security of the people of dryland areas.

The major challenges of rainfed agriculture would be to achieve sustainability and resilience and sustain the livelihoods of the small and marginal framers. Failure to address these challenges will lead to substantial shift of rural youth to service sector resulting in huge manpower shortage in farming. While there is an enormous opportunity exists in high rainfall regions specially in eastern, parts of central and north eastern region for enhancing the cropping intensity either by effective management of available rainfall through harvesting and efficient reuse or through ground water resources, preference for growing commercial crops even in less endowed areas are witnessed. The challenge therefore lies in balancing the land use and cropping pattern as per the resource endowment and also meeting the demand of market forces as well as national and international needs. Some of the challenges like retaining area under the nutritious cereals can be converted into opportunities with growing awareness on the health benefits of these crops and/or realising the higher profits through value addition of processing foods.

In rainfed regions, apart from enhancing the availability of water by various methods, the approach should be to increase the water-use efficiency by reducing losses associated with utilization of water, to maximize returns from every drop of harvested water and to enhance cropping intensity. Improving soil

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health through on-farm generation of organic matter with appropriate policy support would bring in much needed improvement of soils in rainfed regions. Selecting suitable crops and varieties through systematic analysis of long term weather conditions for different locations, will help increase production of a single crop, in maintaining soil cover for longer period and also to promote short duration based double cropping systems of millets/ pulses/ oilseeds or combination of them. Over a period of 50 years, centres of AICRP for Dryland Agriculture developed agro-ecology specific technologies in rainwater management, choice of crops and efficient cropping systems, and other agronomical practices, therefore, scaling out these technologies, a greater portion of drylands can be put under intensive cropping systems including relay cropping and double cropping. Agro-ecology specific Conservation agriculture (CA) strategies are needed in rainfed production systems that have the scope in saving in time, reduced cost of production and increase in soil carbon storage.

Diversification and/or consolidation of farms and farming activities improve the utilization of labour, realizing better values for the produce by aggregation of farmers through farmer producer organisations, reduce unemployment in areas where there is a surplus of underutilized labour and provide a source of living for those households that operate their farm as a full-time occupation. Integrated farming systems (IFS) including agro-forestry, in rainfed agroecosystems is likely to increase resilience and support livelihoods through simultaneous production of food, fodder for animals and fuel as mitigation of the impact of climate change. Smart, cost effective and energy efficient farm mechanization and improved access to the farm machinery for timely agricultural operations with precision is an important adaptation strategy to deal with climatic variability and for enhanced productivity and income. For this, existing custom hiring of agricultural machinery models, as an institutional arrangement, needs to be remodelled to serve the majority of the small and marginal farms.

Droughts, high intense storms and heat waves have severe effects on agricultural production. The impact of these events on farmer's livelihood can be reduced if farmers have advance information about the probable occurrence of these events in their geographical locations. Real-time monitoring of weather conditions and advance weather information will be of immense use in planning real-time agricultural operations. Technology transfer is one of the weakest links in rainfed agriculture. The public sector extension system is unable to meet the demands of the rainfed agriculture which is quite diverse and challenging. The only way is to build the capacity of the community-based organizations and farmers groups so that the knowledge acquiring and transfer processes can go in the hands of the community. Research on use of ICTs for monitoring and developing early warning systems for climate variability such as drought, floods and other extreme weather events has to be taken up.

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The proposed international conference, which also commemorates completion of 50 years of AICRPDA, ICAR-CRIDA, is aimed to bring together the international and national researchers, farmers, NGOs, policy makers to discuss on: the successful initiatives made at global to local scales for development of rainfed regions by national and state governments, NGOs etc.; latest technological interventions adopted in rainfed agriculture; policy support needed to reduce the burden on rainfed farmers and to stabilise farm income. Opportunities emanating to convert rainfed regions as production hubs of nutritious cereals, pulses, oilseeds, diversified land use promotion with crop-animal-tree integrated systems for mitigation of climate change impacts would be discussed extensively. The proceeding of the conference would be brought out and the recommendations would likely to provide a direction for development of rainfed areas, climate resilient rainfed agriculture in the years to come with secured livelihoods and enhanced farm income.

### **Theme:**

The theme of the International Conference will be **“Reimagining Rainfed Agro-ecosystems- Challenges & Opportunities”**. Tentatively there will be following sub-themes for the Conference. Each sub-theme will have a separate symposium

### **Broad Sub-Themes**

- 1) Resilience through land and water management interventions, water management and governance
- 2) Ecosystem based approaches for climate change adaptation, ecosystem services, integrated farming system models and Land degradation neutrality
- 3) Managing genetic resources for enhanced stress tolerance
- 4) Sustainable soil management, conservation agriculture, organic farming, INM, soil-microorganisms-plant interactions
- 5) Emerging approaches for biotic and abiotic stress management through big data analytics, precision farming, remote sensing, drone technology, AI, ML, Nanotechnology, modelling
- 6) Institutional and policy innovations for accelerated and enhanced impacts

### **Panel discussion (1 hr each)**

- a) Natural farming
- b) Insurance needs for rainfed agro ecosystem
- c) Agromet-advisories
- d) Real Time Contingency Planning

### **Presentations:**

There will be five categories of presentations:

- ✚ Plenary
- ✚ Invited
- ✚ Oral
- ✚ Rapid fire
- ✚ Poster

**Plenary Lectures:** Eminent Scientists/Administrators in agriculture will be invited to deliver special lectures on the topics related to eco system services, food production and policy, farming systems research, climate change, conservation agriculture, energy, environment, water governance and management, input use efficiency, etc.

**Invited papers:** Six Symposia have been planned on the sub-themes of the Conference as listed above. Selected speakers will be invited to make their presentations on the subthemes of the conference.

**Oral presentations:** Selected papers will be presented as oral presentations under each Sub-theme

**Rapid fire presentations:** Selected papers will be presented as rapid fire presentations under each Sub-theme

**Poster presentations:** There will be an organized Poster Session covering the themes identified in the Symposia to encourage wider interaction and information sharing. The papers contributed for Poster Session will be screened and each Poster Session will have a Convener and Co-convener. The Conveners/Co-conveners will prepare and present Summary of the concerned Poster Session. This will permit discussion and help in formulation of meaningful recommendations.

### **Panel discussions**

Four panel discussions would be held on topics relevant to rainfed agriculture with eminent speakers

### **Exhibition and Advertisement**

An exhibition will be organized at the conference venue, the details of the space available and charges etc. will be made available in the second circular. Advertisement can be included in the conference publications.

### **Sponsorship**

Organizers need sponsorship from different organizations for achieving the objectives of the Conference in wider perspectives.

**Language:** English will be the official language of the Conference.

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**Venue:** CRIDA Auditorium, ICAR-CRIDA, Hyderabad, Telangana, India

**Conference duration:** Three days; 22-24, December, 2022

### REGISTRATION FEE

#### Foreign delegates:

<b>Category</b>	<b>:</b>	<b>Registration fee</b>
Scientists	:	US \$ 700 (After due date US\$ 800)
Industry and private organizations	:	US \$ 800 (After due date US\$ 900)
Students/Research Scholars	:	US \$ 350 (After due date US\$ 400)
Accompanying member	:	US \$ 350

#### Indian delegates:

<b>Category</b>	<b>:</b>	<b>.Registration fee</b>
ISDA Member Scientists (In-service)	:	Rs.8000 (After due date Rs. 10000)
ISDA Member Scientists (Retired)	:	Rs. 6000 (After due date Rs. 7000)
Non-ISDA Members	:	Rs.9000 (After due date Rs. 11000)
Industry and private organizations	:	Rs. 12,000 (After due date Rs. 15,000)
Student/Research Scholar	:	Rs. 3000 (After due date Rs. 4,000)
Accompanying member	:	Rs. 2,000

#### Through Hybrid mode: 50% of above for each category

**CURRENCY:** Rupee is the national currency of India. All major international currencies can be exchanged at the International Airports, 5-star Hotels and Banks. Major currencies are accepted at the hotels and some major shopping centres. International credit/ debit cards are widely accepted.

**ACCOMMODATION:** The registration fee does not include accommodation charges. Limited accommodation is available in the government guest houses. Most of the delegates will have to stay in hotels. A wide range of accommodation varying from 5-Star hotels to guest houses is available. The likely tariffs are as follows:

<b>Category</b>	<b>:</b>	<b>Tariff</b>
5-Star Hotels	:	US \$ 400-800 ( ` 6,000–8,000) per day diem/night
Medium range Hotels	:	US \$ 200-400 ( ` 2,500–5,000) per day diem/night

5-Star Hotels: Park Hyatt, Taj Krishna, Radisson, ITC Kakatiya, Golkonda, Ashoka, Lemon tree etc.

### Important Dates

<b>Notice of 1st Intent (First Circular)</b>	<b>: 30<sup>th</sup> June, 2022</b>
<b>Submission of Abstract</b>	<b>: 30<sup>th</sup> August, 2022</b>
<b>Acceptance of paper/extended summary</b>	<b>: 30<sup>th</sup> September, 2022</b>
<b>Registration fee (without late fee)</b>	<b>: 15<sup>th</sup> October 2022</b>
<b>Receipt of full length invited papers</b>	<b>: 31 October, 2022</b>

### Internet:

The information contained in this circular and all updates are available on:  
**[www.drylandagri.org.in](http://www.drylandagri.org.in)**

### Tours:

Pre-and post-conference tours to tourist spots will be organized for the registered delegates and accompanying persons in and around Hyderabad as well as other places of interest.

### Second Circular

The second circular containing further information will be sent only to those who send the Notice of Intent.

### About Hyderabad city

Hyderabad is the capital of the state Telangana, India. It also goes by its Sobriquet City of Pearls. It is the fourth most populous city and sixth-most populous urban agglomeration in India. Hyderabad was founded by Muhammad Quli Qutub Shah in 1591 on the banks of Musi. Today the city covers an area of approximately 650 square km. The twin cities of Hyderabad and Secunderabad come under the ambit of a single municipal unit, The Greater Hyderabad Municipal Corporation.

Hyderabad has developed into one of the major hubs for the information technology industry in India which has earned it the additional sobriquet "Cyberabad". In addition to the IT industry, various biotechnology and pharmaceuticals companies have set up their operations in Hyderabad owing to its established Public sector in Life Science Research and Genome Valley. All Residents of Hyderabad are generally called Hyderabadis. Located at the crossroads of North and South India, Hyderabad has developed a unique culture that is reflected in its language and architecture.

Hyderabad, also known as the 'City of Nawabs' is steeped in rich culture and history. The city is known for its opulent heritage, with a wide array of mosques, churches, temples, monuments, historic places, food and the arts. The city of Hyderabad is recognized for its hospitality and is the one place where you can find a perfect amalgam.

Hyderabad has an international airport which is serviced by international flights from Europe and the Middle East. Domestic flights operate from all major hubs. Taxis and auto-rickshaws ply back and forth to the city center. Hyderabad has three railway stations: Kacheguda, Hyderabad Deccan (Nampally) and Secunderabad. All three are major junctions on the South and West Zone sectors of the Indian Railways linking Hyderabad to major destinations like Mumbai, Delhi, Kolkata, Pune, Chennai, Bangalore and Thiruvananthapuram. There are many other places of tourist interest,

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which might fascinate you. Trips will be arranged on payment basis. Our travel counter will be pleased to help you in this regard.

### **Weather**

Hyderabad has a tropical wet and dry climate bordering on a hot semi-arid climate. Weather during the conference period from 22-24 December 2022 would be very pleasant mostly dry and cool with mean minimum temperature ranging from 10 to 15 degree Celsius and maximum mean temperature around 28 degrees Celsius.

### **Contact**

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**PARTICIPATION FORM**

***International Conference on***

**“Reimagining Rainfed Agro-ecosystems- Challenges & Opportunities”**

**22-24, December, 2022, Hyderabad, Telangana, India**

*(Please mail this form so as to reach the Organizing Secretary latest by 15<sup>th</sup> September, 2022)*

**Name: Prof./Dr./Mr./Mrs./Ms.** \_\_\_\_\_

**(Please underline your last name)**

**Country:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Tel. No.** \_\_\_\_\_

**Fax** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Sub-theme of interest:** \_\_\_\_\_

**I am interested in:**

- Attending the Conference**
- Presenting an Invited paper on.....**
- Presenting an oral paper on.....**
- Presenting a rapid fire paper on .....**
- Presenting a Poster on .....**
- Pre- Conference Tour**
- Post Conference Tour**

**Signature**

**Mailing Address:**

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