



National Seminar on

**Harnessing the Potential of *Panchabhutas (tatvas)* for
Sustainable Climate Resilient Rainfed Agriculture**

28th September 2022

Organized by

**Indian Society of Dryland Agriculture (ISDA), Hyderabad
Bharatiya Agro Economic Research Centre (BAERC), New
Delhi**

Hosted by

**ICAR-Central Research Institute for Dryland Agriculture
Santoshnagar, Saidabad Post, Hyderabad, Telangana**

Preamble

Life is created and preserved by *Panchbhutas* or *tatvas* (five elements) of nature according to the ancient Indian scriptures from the Vedic times (Ramcharitmanas, Kishkindhakand, 11/2) (Prasad, 2016). *Kshiti* (earth), *jal* (water), *pawak* (fire), *gagan* (sky), and *sameera* (wind) are *panch* (five) *bhutas* or *tatvas* (elements or components). These *panchbhutas* have a pivotal role in agriculture and allied activities. Earth provides land, a complex of soil, water and space for agriculture and nutrients for plants that provide food for humans and animals. Soil is the upper most layer of earth crust commonly known as pedosphere in which most of metallic cations and anions are fitted in voids between oxygen atoms forming different crystal structures. Water is essential for life. Underground water is the major source of irrigation in agriculture. Out of annual precipitation of 110000 km³, 56% evapo-transpired by forest and landscapes and 5% by rainfed agriculture. Remaining 39% is lost through run-off (Prasad, 2016). One of the major roles of water related to human life is the production of oxygen from the photolysis of water in photosynthesis on plants. Absence of rains for a prolonged period lead to dryspells, droughts and eventually to famines and deserts. Water in agriculture has therefore to be more efficiently used which was also mentioned by ancient workers in India long back in *Kashyapiyakrishisukti* of ca800 AD. Although Goswami Tulsidas has used the word *pawak* which literally means fire in broader perspective it includes all kinds of energy including electricity produced from different sources (thermal, hydel, solar or wind). *Gagan* or sky includes empty space and three visible objects viz., sun, moon and clouds. Water, Solar radiation and CO₂ is the triad that produces food for all living beings on earth through photosynthesis. Moon is considered as the God of plants and vegetation in Hindu mythology. The sky also houses the clouds which are only source of rains and fresh water. *Sameer* refers to the atmosphere which provides gases (oxygen, carbon dioxide and nitrogen) essential for life. Besides the role of individual gases, wind per se plays very important role in agriculture such as movement of clouds (south-westerly winds) which cause SW monsoon. Wind power can be directly used for producing electricity. India has plans to produce 80 GW of electricity using solar power (India Abroad 2015) which may also reduce the cost of cultivation.

At a more fundamental level, living cells are viewed as encapsulated forms of these five elements. Various cell organelles are referred to as *pruthvi*, the metabolic processes that occur in cells as *agni*, the cell organelles are kept intact at their places by *akash*, and *jal* and *sameer* enable the flow of contents within and between cells and thus enable the entire life process. The progress in understanding these life processes is at the core of the advances in science and technology that is the hallmark of the modern history.

Nearly 52% of the net sown area in India is rainfed where farming depends solely on rainfall and harvested rain water. About 40% of the nation's food grains are produced in rainfed areas which also support two-thirds of the livestock population. Significant area (more than 70%) of pulses and oilseeds is rainfed. Lack of irrigation facilities, improper distribution of rainfall, high intensity rainfall in short time, inadequate groundwater, frequent droughts, prolonged dry spells, reduced number of rainy days, 84% small and marginal farmers, shallow soil depth and low organic matter status, low water holding capacity, sub-surface hardpan, surface crusting and micronutrient deficiencies are major crop production constraints in rainfed agriculture. Depletion of organic carbon content in rainfed soils is the major issue to be addressed for protecting and preserving soil health for future generations. Although the average per hectare productivity levels have increased from 0.6 tonnes in the eighties to 1.2 tonnes at present, large gaps still remain in several crops and regions between yields obtained at research stations and in farmers' fields. Rainfed areas are more vulnerable to climate change due to several constraints as compared to irrigated areas. Several climate resilient technologies that essentially help manage soil, water and energy resources better have been developed and demonstrated to farmers under different schemes/projects of central and state governments. But the rate of adoption of NRM technologies by farmers is very low due to various reasons and lack of proper policies. A National Seminar will be organized on 28th September 2022 at ICAR-CRIDA, Hyderabad to discuss the how five fundamental elements can be harnessed for more sustainable agriculture in rainfed areas.

Purpose: To deliberate on how rainfed farming technologies affect natural resources and to suggest policy interventions to protect environment and health in rainfed areas.

Scientific Programme

The following themes and topics have been identified for Panel Discussions during the deliberations in the National Seminar.

Panel Discussion 1: Sustainable Rainwater Management for Climate Resilient Agriculture

- Impact of implementation of efficient rainwater management technologies on sustainability and climate resilience of rainfed systems
- Government programmes/policies on rainwater management: implementation and impact
- Implementation of rainwater management technologies and sustainability: Farmers' Perspective

Panel Discussion 2: Sustainable Soil and Nutrient Management for Climate Resilient Rainfed Agriculture

- Impact of sustainable soil and nutrient management for climate resilient agriculture
- Government and policy support for sustainable soil and nutrient management in rainfed areas
- Changing policy needs for protecting land resources, land use planning, soil health and farmers' profitability

Panel Discussion 3: Rainfed Farming Practices for Sustainable Environment and Health in Rainfed Areas

- Current status and issues of climate, environment and health in rainfed areas and measures for enhancement
- Ecological farming approaches for sustainable environment and health and their impact on rainfed production systems (including indigenous technical knowledge)
- Challenges in implementation of environmentally sustainable measures and policy needs

Panel Discussion 4: Participation of society, farmers, governments and other stake holders in planning and development of climate resilient rainfed areas

- ❖ Innovative extension tools for sustainable and climate resilient rainfed production systems.
- ❖ Agricultural extension management and capacity building for climate resilient rainfed agriculture
- ❖ Role of NGOs in strengthening research and extension for sustainable and climate resilient rainfed agriculture

Submission of papers for poster presentations

Papers for poster presentation will be accepted from intending participants. Interested persons are requested to send abstract of poster paper on any subject related to above theme areas of the national seminar. The abstract should be within one page (up to 350 words) in double space and typed in English (MS word format). The abstract may be submitted through e-mail. The last date for receipt of extended abstract is **30th August 2022**. Every abstract will be peer reviewed and only those found suitable for will be accepted. While sending abstracts, it is essential to mention S. No. and Title of Theme area of panel discussion. Participants of selected abstracts will be informed by e-mail. Not more than one abstract will be accepted from a single registered participant. Awards will be considered for the best poster presentation. The editorial board would select some good quality

abstracts of poster presentations for publication of their full-length papers in the forthcoming issue of the ISDA journal provided that the senior author is a member of society.

Venue

The seminar will be held at ICAR-Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad. Hyderabad is well connected by rail/road as well as air.

Registration

All participants are required to register in advance. The schedule and fee for registration is given below for various categories of participants. Fee for participation may be sent through Crossed Bank Draft/NEFT Transfer/Google Pay etc in favour of "Indian Society of Dryland Agriculture", payable at Hyderabad.

The registration form or its photocopy may be filled and mailed along with registration fee in the form of DD or receipt of NEFT or Google pay or on-line transfer details by **30th August 2022**. Registration form may also be downloaded from the ISDA website.

Details of Registration Fee	Up to 30 th August 2022	After 30 th August 2022
Delegates	Rs. 2000	Rs 2500
Students/Farmers	Rs. 1500	Rs. 2000
Corporate house/Representatives	Rs. 5000	Rs. 6000
Accompanying persons	Rs. 1500	Rs. 2000
Note: Registration fee once paid is not refundable or adjustable against any other person.		

Payment details:		
1.	Name of bank:	PUNJAB NATIONAL BANK
2.	Branch Name:	SANTOSH NAGAR, Hyderabad
3.	Branch Code:	4630
4.	Beneficiaries/ Organization name & Bank Account Number:	ISDA (CRIDA) 0689010100009978
5.	MICR No. of Bank:	500024025
6.	IFSC Code:	PUNB0463000
7.	Electronic Mode (CORE/RTGS):	RTGS



Payment can also be made through UPI

Accommodation

Limited accommodation is available in the Guest Houses of ICAR Research Institutes located in Hyderabad. This will be booked on first-cum-first basis. Afterwards, the participants will be allotted nearby hotels.

For Registration and any query please contact;

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(28th September 2022)

REGISTRATION FORM

S. No.	Item	Details
1	Name (Capital letters):	
2	Profession:	
3	Designation:	
4	Organization:	
5	Mailing Address:	
		City: _____ Pin code: _____
6	Mobile number:	
7	Fax Number (If any):	
8	Phone number with area code:	Office: _____
		Residence: _____
9	Are you a member of the Indian Society of Dryland Agriculture (ISDA)?	
10	Name of accompanying person (s), If any	
11	Title of paper for poster presentation	
12	Details of registration fee:	Amount paid (Rs): _____
		DD No. _____ Date: _____
		Name of the bank and branch _____
		Details of on-line payment: _____

	Date: _____	Signature: _____