Achievements

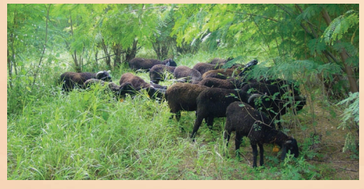
Major research achievements of the institute during the last 27 years are:

- Agroclimatic characterization and delineation of areas suitable for different crops/cropping systems in rainfed regions and assessment of drought probabilities
- Value added agrometeorological advisory services (www.cropweatheroutlook.in) and district-wise crop contingency strategies for monsoon aberrations

- Development, testing and commercialization of implements for timely agricultural operations such as planters, intercultural implements, herbicide applicators, low-lift portable pump sets for lifting water from farm ponds etc
- Release of two improved dual purpose horse gram varieties (CRIDA 18R and CRHG 04) for cultivation in peninsular India
- Transgenic sorghum for enhanced drought tolerance

- Identification and popularization of K-636 variety of *Leucaena* for industrial biomass production
- A large culture bank of agriculturally important microbes and microbial technologies for enhanced seed germination under high soil temperatures and alleviating zinc deficiency in soils
- Development of location specific *in situ* moisture conservation practices for diverse soil and climatic conditions

- Mapping areas with potential for rainwater harvesting in the country and standardization of farm pond technology
- Strategies for agricultural drought management in dryland areas, contingency planning and required mid-season interventions
- Soil quality enhancement through residue recycling, conservation agriculture and biochar application
- Hyper-spectral remote sensing for detection of crop stresses
- Agrotechnologies for maximizing yields in biofuel crops like jatropha and pongamia
- Easy-to-use software for drought monitoring, estimation of runoff potential in watersheds, agroclimate data analysis, tank silt recycling and insect pest incidence in rice & cotton.
- Mapping of climatically vulnerable regions of the Country following the IPCC methodology of exposure, sensitivity and adaptive capacity
- Weather-based pest and disease forewarning systems for major crops
- Development of alternate land use systems involving agri-silvi, silvi-pastoral, agri-horti and horti-pastural systems with focus on marginal lands
- Up-scalable models for enhancing livelihood security in rural areas through convergence of schemes at village level



Training, Consultancy and Contract Research Services

Based on its rich expertise and experience, CRIDA offers the following services:

- Planning, monitoring and evaluation of watershed development projects
- Drought management strategies for minimizing risk in rainfed crops
- Early warning systems for drought studies
- Production technology for rainfed crops
- Integrated pest and nutrient management in rainfed crops
- Production of quality biofertilizers, bio-pesticides and planting materials of multipurpose trees

- Application of modern tools like GIS, remote sensing etc for resource characterization and monitoring
- Dryland mechanization
- Agro-forestry, dryland horticulture and alternative land use systems
- Generation of crop-weather relationship data to support weather based crop insurance
- Contract services for analysis of soil, water, plant, organic manures and biofertilizers for quality assessment, and greenhouse gases quantification

Besides, CRIDA can also take up customized consultancies and contract research for the clients within its mandate

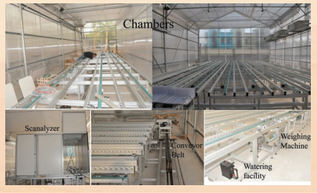
Road Map for Future

- Continue to address critical problems of rainfed agriculture through basic and strategic research using frontier tools
- Promote cost-effective water harvesting and recycling technologies for supplemental irrigation and drought-proofing of rainfed crops
- Application of biotechnological tools for inducing drought tolerance in rainfed crops and enhancing input use efficiency
- Rehabilitation of marginal and wastelands through crop diversification and alternate land use systems
- Development of agro-techniques including farming system modules for enhanced productivity and profitability in rainfed regions
- Design and development of efficient implements for small farm mechanization and their increased accessibility to small farmers through custom hiring centres
- Undertake action research to evolve innovations in technology dissemination and up-scaling for enhancing livelihood security
- Carry out impact assessment of technologies and suggest policy reforms for better adoption of technologies in rainfed agriculture
- Develop linkages and collaborate with national and international agencies in advancing rainfed agriculture

National Initiative on Climate Resilient Agriculture (NICRA)

CRIDA coordinates the national programme on climate change across the Country with the following two key objectives:

- Enhance the resilience of rainfed agriculture to climate change by developing adaptation and mitigation strategies in crop and livestock systems
- Develop climate smart villages in India by promoting practices that efficiently use weather, soil, water and energy resources



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CRIDA

At a Glance

भाकृअनुप
ICAR

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agriesearch with a human touch

CENTRAL RESEARCH INSTITUTE FOR DRYLAND AGRICULTURE
1985
केंद्रीय कृषिवानिकी अनुसंधान संस्थान

Central Research Institute for Dryland Agriculture

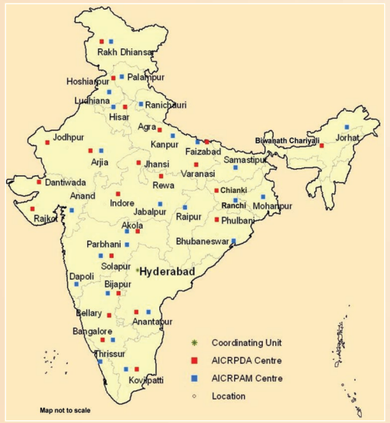
Santoshnagar, Hyderabad 500 059

Introduction

Rainfed Agriculture occupies very prominent position in Indian Agriculture. It supports 40% of the India's population and contributes 40% to the national food basket. Unlike irrigated areas, where the green revolution ushered significant gains in productivity, rainfed regions continue to suffer from low productivity (< 1 t/ha) due to uncertain rainfall, frequent droughts, degraded soils etc. Increasing climatic variability and climate change pose new challenges in the form of changes in rainfall and temperature patterns coupled with more extreme weather events.

From the initial efforts of dry farming research at Manjari, Pune in 1923, impetus on dryland agriculture increased over time. A major development was establishment of All India Coordinated Research Project for Dryland Agriculture (AICRPDA) in 1970. To give further boost to basic and strategic research in dryland agriculture, the Indian Council of Agricultural Research (ICAR) established a full-fledged institute - Central Research Institute for Dryland Agriculture (CRIDA) at Hyderabad in 1985. Since then, significant contributions have been made in rainfed regions for enhancing the agricultural productivity, conservation and sustainable use of natural resources. CRIDA has successfully executed the National Agricultural Technology Project (NATP) of ICAR by leading the Directorate of Rainfed Agro-ecosystem during 1998-2005. Under National Agricultural Innovation Project (NAIP) too, CRIDA has significantly contributed through basic, strategic and action research projects during 2007-2013.

Realizing the importance of climate change on Indian agriculture vis-a-vis food security, ICAR initiated a Network Project on Climate Change (NPCC) in 2006 to address climate change related issues of agriculture across the country. Subsequently, ICAR launched the National Initiative on Climate Resilient Agriculture (NICRA) during XI plan with CRIDA as the nodal institute. The main aim of the NICRA is to enhance the resilience of Indian agriculture covering crops, livestock, poultry and fisheries to climate variability and climate change by developing improved production technologies and risk management strategies. By leading two coordinated projects and one large network project, the institute is playing a key role in planning, coordinating and implementing research in key areas of rainfed agriculture and climate change with nationwide foot print.



To address the location-specific problems of rainfed areas, ICAR started AICRPDA in 1970 across 22 (presently 25) centres in rainfed regions of the country with the headquarters at Hyderabad. All India Coordinated Research Project on Agrometeorology (AICRPAM) was started in 1983 for understanding crop-weather relations. Started with 10 centres, AICRPAM now has 25 centres spread across all regions of the country.

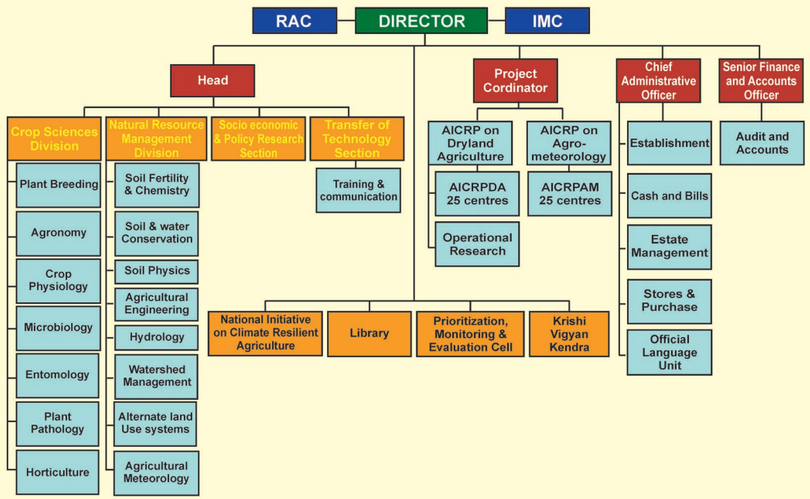
Mandate

- Undertake basic and applied research that will contribute to the development of strategies for sustainable farming systems in the rainfed areas
- Act as a repository of information on rainfed agriculture in the country
- Provide leadership and co-ordinate network research with state agricultural universities for generating location-specific technologies for rainfed areas
- Act as a centre for training in rainfed-farming systems, and
- Collaborate with relevant national and international agencies in achieving the above objectives

Organization

CRIDA is organized with an inter-disciplinary structure and has strong focus on on-farm participatory research with a large portion of its resources devoted to out-reach programmes.

ORGANOGRAM



Location

The institute is located at Santoshnagar in the historic city of Hyderabad, about 25 km from airport, 16 km from Secunderabad railway station and 7 km from Hyderabad railway station.

Human Resource

Sixty-seven scientists from various disciplines assisted by well-trained technical staff (72) are actively involved in implementing the mandated activities of the institute. Administrative (43) and skilled supporting staff (39) lend the need-based support in facilitating research activities. In addition, more than 100 post-graduates in agriculture and allied disciplines support the scientists as staff in various schemes.

Infrastructure Facilities

CRIDA campus houses well equipped laboratories, glass house, net houses, rain-out shelter, office complex, International Guest House, Trainees' Hostel, Conference halls, Auditorium, Library, and Museum etc.

Laboratories: CRIDA has 15 well-equipped laboratories to support multi-disciplinary research on natural resource management and crop sciences. Laboratories of various disciplines such as Agronomy, Soil chemistry, Soil physics, Hydrology, Plant physiology, Microbiology, Plant breeding, Molecular biology, Agroforestry, Horticulture, Plant pathology, Entomology and Animal sciences are well equipped with state-of-the-art facilities. In addition, Central laboratory, Agrometeorology Data bank, and GIS laboratories cater to the needs of research across the divisions. Dedicated laboratories for root study and estimation of green house gases were added during XI plan.

Glass House and Net Houses: The transgenic glass house of the institute conforms to containment standards for evaluating transgenic crops. In addition, a well maintained net house and climate controlled green house are available for pot experiments.

Climate Change Research Facilities: Six Open Top Chambers (OTCs) were set up to assess the impact of elevated CO_2 concentration on crops and soils. State-of-the-art Phenotyping Platform with automated non-destructive imaging based scan analysis of crop growth and development has been developed during XI plan to characterize genetic material with drought and other abiotic stress tolerances. A 7 ha research complex to study crop and soil response to elevated temperature, CO_2 and extreme rainfall events has been developed at Hayatnagar research farm.

Agrometeorology Databank: The AICRPAM is maintaining long-term meteorological and crop yield data for different agro-climatic regions of the country. It hosts a website www.cropweatheroutlook.in that provides crop-weather status and value added agro-advisories. Contingency crop planning for various rainfed regions is being updated every week on the website for the benefit of rainfed farmers and state line department officers.

Library: The institute's library has a collection of over 8187 books and 4719 back volumes of periodicals. It subscribes to 132 Indian and 21 foreign journals and is equipped with AGRICOLA, AGRIS, CROP-CD and Soil-CD databases. The library extends on-line access of over 2000 peer reviewed journals through e-CeRA, Agroforestry abstracts and Science Direct.

Agriculture Knowledge Management Unit (AKMU): It provides e-mail, web-hosting, internet and file transfer services to institute scientists and other officers. The Government of India has provided National Knowledge Network (NKN) connectivity to CRIDA. Video conferencing facility has been established with AICRP centres.

Institute Technology Management Unit (ITMU): The ITMU acts as a repository of Intellectual Properties (IPs) of CRIDA and facilitates all scientists in protecting and commercialization of their IPs. The ITMU plays a key role in drafting MoUs, MoAs, technology licencing, filing of patents, copy rights and conducting awareness programs on IPR issues. It also liaises between Institute and ICAR in fostering public-private partnerships for knowledge generation and dissemination in the field of rainfed farming for the ultimate benefit of both inventor and end-user.

Research Farms: The institute has two well developed research farms at Hayatnagar (280 ha) and Gunegal (80 ha) representing typical dryland production system. These farms located at 15 and 45 km from the institute, respectively are well equipped with workshop and other facilities to support field experiments and demonstrations. Water harvesting system has been developed at Gunegal research farm to facilitate research and extension programmes.

Conference Facilities: There are three air-conditioned conference halls (with seating capacities of 25, 30 and 100) equipped with state-of-the-art presentation facilities. The institute has also a large auditorium having 300 seating capacity which is named after Late Dr. Ch. Krishnamurthy, Founder Director of the institute.

Museum: The history of dryland research and major research achievements are depicted through charts, photographs, models etc in the well maintained Dryland Gallery.