

1. Introduction

The All India Coordinated Research Project for Dryland Agriculture (AICRPDA) was launched in 1970 by the Indian Council of Agricultural Research in IV Plan period, in collaboration with the Government of Canada through Canadian International Development Agency (CIDA) with Co-ordinating Cell at Hyderabad, Andhra Pradesh. In 1985, the Project Directorate of AICRPDA was upgraded to the status of an institute i.e. Central Research Institute for Dryland Agriculture (CRIDA) to carry out basic and strategic research while network research under AICRPDA umbrella continued in applied and adaptive research mode. Presently, AICRPDA network has 22 centres and 8 Operational Research Project (Fig.1). viz. 20 centres in State Agricultural Universities, 2 in Technical / other Universities and 3 in ICAR institutes located in 15 states in various agro-ecological settings (Table.1).

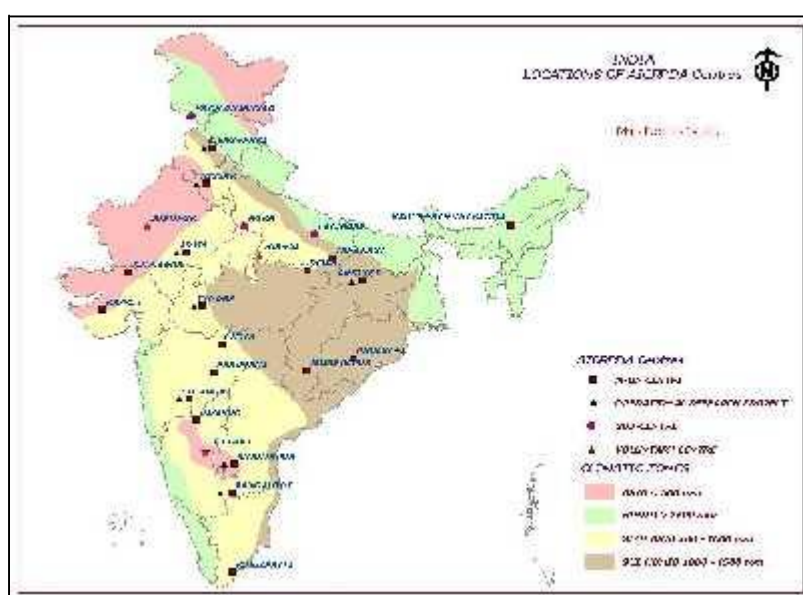


Fig.1. AICRPDA Network Centres – Location map

The research under AICRPDA network centres focuses on location specific problems considering agroecological characteristics, predominant rainfed production systems and socioeconomic settings with specific emphasis on soil conservation and rainwater management, evaluation of crops/varieties, cropping/farming systems and contingency planning, integrated nutrient management, alternate land use systems for diversification and efficient implements on a template of resource management particularly rainwater management.

Table-1: The details on agroecological setting of AICRPDA Network centers

Name of the Centre	SAU / ICAR Institute/ Others (Hqrs)	Agro-Climatic Zone (NARP) / Agro – ecosub region (AESR)	Climate**	Mean Annual Rainfall (mm)	Dominant Soil Type	Major Rainfed Crop based Production System
Agra (SC)	RBSC, Agra	South – western semiarid zone in Uttar Pradesh (4.1)	Semiarid (Hot dry)	665	Inceptisols	Pearlmillet
Akola (MC)	PDKV, Akola	Western Vidarbha Zone in Maharashtra (6.3)	Semiarid (Hot moist)	824	Vertisols	Cotton
Anantapur (MC & ORP)	ANGRAU, Hyderabad	Scarce rainfall zone (Rayalaseema) in Andhra Pradesh (3.0)	Arid (Hot)	544	Alfisols	Groundnut
Arjia (MC & ORP)	MPUAT, Udaipur	Southern zone in Rajasthan (4.2)	Semiarid (Hot dry)	656	Vertisols	Maize
B.Saunkhri (MC & ORP)	PAU, Ludhiana	Kandi region in Punjab (9.1)	Subhumid (Hot dry)	1011	Inceptisols	Maize
Bangalore (MC & ORP)	UAS_B, Bangalore	Central, eastern and southern dry zone in Karnataka (8.2)	Semiarid (Hot moist)	926	Alfisols	Fingermillet
Bellary (VC)	CSWCRTI, Dehradun	Northern dry zone in Karnataka (3.0)	Arid (Hot)	502	Vertisols	<i>Rabi</i> Sorghum
Bijapur (MC)	UAS_D, Dharwad	Northern dry zone in Karnataka (6.1)	Semiarid (Hot dry)	595	Vertisols	<i>Rabi</i> Sorghum
Biswanath Chariali (MC)	AAU, Jorhat	Nprth Bank Plain zone in Assam (15.2)	Humid (Hot)	1990	Alfisols	Rice
Chianki (MC & ORP)	BAU, Ranchi	Western plateau zone of Jharkhand (11.0)	Subhumid (Hot moist)	1179	Inceptisols	Rice
Faizabad (SC)	NDUAT, Faizabad	Eastern plain zone in Uttar Pradesh (9.2)	Subhumid (Hot dry)	1051	Inceptisols	Rice
Hisar (MC & ORP)	CCSHAU, Hisar	South-western dry zone in Haryana (2.3)	Arid (Hyper)	412	Inceptisols	Pearlmillet
Indore (MC & ORP)	RVSQVV, Gwalior	Malwa plateau in Madhya Pradesh (5.2)	Semiarid (Hot moist)	958	Vertisols	Soybean
Jagadapur (MC)	IGAU, Raipur	Basthar Plateau zone in Chattisgarh (12.1)	Subhumid (Hot moist)	1297	Inceptisols	Rice
Jhansi (VC)	IGFRI, Jhansi	Bundhelkhand zone in Uttar Pradesh (4.4)	Semiarid (Hot moist)	870	Inceptisols	<i>kharif</i> Sorghum
Jodhpur (VC)	CAZRI, Jodhpur	Arid Western zone of Rajasthan (2.1)	Arid (Hyper)	331	Aridisols	Pearlmillet
Kovilpatti (MC)	TNAU, Coimbatore	Southern zone of Tamil Nadu (8.1)	Semiarid (Hot dry)	723	Vertisols	Cotton
Parbhani (MC)	MAU, Parbhani	Central Maharashtra Plateau Zone in Maharashtra (6.2)	Semiarid (Hot moist)	901	Vertisols	Cotton
Phulbani (MC)	OUAT, Bhubaneswar	Eastern Ghat Zone in Orissa (12.1)	Subhumid Hot moist)	1580	Oxisols	Rice
Rajkot (MC)	JAU, Junagarh	North Saurashtra zones in Gujarat (5.1)	Semiarid (Hot dry)	590	Vertisols	Groundnut
Rakh Dhiansar (SC)	SKUAS_T, Jammu	Low altitude subtropical zone in Jammu and Kashmir (14.2)	Semiarid (Moist dry)	860	Inceptisols	Maize
Rewa (MC)	JNKVV, Jabalpur	Keymore plateau and Satpura Hill zone in Madhya Pradesh (10.3)	Subhumid (Hot dry)	1088	Vertisols	Soybean
S.K.Nagar (MC)	SDAU, Dantewada	Northern Gujarat in Gujarat (2.3)	Semiarid/Arid (Hot dry)	670	Entisols	Pearlmillet
Solapur (MC & ORP)	MPKV, Rahuri	Scarcity zone in Maharashtra (6.1)	Semiarid (Hot dry)	732	Vertisols	<i>Rabi</i> Sorghum
Varanasi (MC)	BHU, Varanasi	Eastern Plain and Vindhyan Zone in Uttar Pradesh (4.3 / 9.2)	Semi arid (Hot moist) Subhumid (Hot dry)	1049	Inceptisols	Rice

Over a period of 3 decades, AICRPDA network centres generated location specific technologies for up scaling in the respective agroclimatic zones. These technologies basically address rainwater harvesting and reuse for higher water productivity, efficient crops/varieties and cropping systems for higher yield and income, contingency crop planning, integrated nutrient management, bullock/tractor drawn farm implements for efficient tillage/seeding/fertilizer application/intercultural and other operations with cost effectiveness and timeliness, alternate land use systems for diversification, higher income and resource efficiency.



The NICRA program at 23 AICRPDA Network centres including IGRI, Jhansi were initiated during 2010, both on-station and on-farm. The on-farm program is being implemented in 35 adopted villages [including Vadakkupatti (Thoothukudi, District Tamil Nadu) and Babhulgaon (Parbhani District, Maharashtra) villages] in 24 districts covering 15 states (Fig. 1. and Table.2).

Table-2: Details of villages under NICRA program

AICRPDA center	Name of the Villages	District	State
Anantapur	Aminabad, Girigetla	Kurnool	Andhra Pradesh
Biswanath Chariali	Chamua	Lakhimpur	Assam
Jagdalpur	Tahakapal, Gumiapal, Pahkapal	Bastar	Chhattisgarh
Rajkot	Pata meghapar	Jamnagar	Gujarat
SK Nagar	Dholia, Kalimati, Chandanki	Banaskantha Mehasana	Gujarat
Hisar	Budhsheli, Charnod, Balawas	Bhiwani	Haryana
Rakh Dhiansar	Khaner	Rakh Dhiansar	Jammu & Kashmir
Chianki	Khumbhi - bankheta	Garhwa	Jharkhand
Bengaluru	Chikkamaranahalli	Bengaluru Rural	Karnataka
Bijapur	Kaulagi	Bijapur	Karnataka
Rewa	Patauna, Raura	Rewa	Madhya Pradesh
Indore	Ningnoti	Indore	Madhya Pradesh
Akola	Warkhed, Belura	Akola	Maharashtra,
Parbhani	Babhulgaon	Parbhani	Maharashtra
Solapur	Narotewadi	Solapur	Maharashtra
Phulbani	Budhadani	Kandhamal	Orissa
Ballowal Saunkhri	Naiwan, Achalpur	Hoshiarpur	Punjab
Arjia	Kocharia, Mandpiya, Sola ka kheda, Lapsiya, Tara ka kheda	Bhilwara Rajsamand	Rajasthan
Kovilpatti	Vadakkupatti	Thoothukkudi	Tamil Nadu
Faizabad	Hardoiya	Faizabad	Uttar Pradesh
Agra	Nagla Duleh khan	Agra	Uttar Pradesh
Varanasi	Terha Saraya	Mizapur	Uttar Pradesh
Jhansi	Kadesara Kala	Lalitpur	Uttar Pradesh

The technical programme is being implemented during 2013-14, both on-station and on-farm, under various themes (Tables 3 & 4), abstract of which is presented below:

Table-3: On-station interventions

Production System/Center	RTCP	RWM	SHCA	EM	ALU	TOTAL
Rice based production system						
Biswanath Chariali	2	2	2	-	4	10
Chianki	10	-	-	-	1	11
Faizabad	7	1	-	1	-	9
Jagadapur	1	2	2	-	-	5
Phulbani	3	-	-	-	-	3
Varanasi	3	1	2	-	-	6
Total	26	6	6	1	5	44
Maize based production system						
Arjia	3	1	-	-	-	4
Ballowal Saunkhri	3	3	1	-	-	7
Rakh Dhiansar	4	1	-	1	1	7
Total	10	5	1	1	1	18
Fingermillet based production system						
Bangalore	4	1	1	-	2	8
Total	4	1	1	-	2	8
Pearlmillet based production system						
Agra	2	1	2	-	-	5
Hisar	5	-	-	-	1	6
SK Nagar	3	2	1	1	-	7
Total	10	3	3	1	1	18
Sorghum based production system						
Bijapur	2	1	1	-	4	8
Solapur	3	-	1	1	-	5
Jhansi	3	1	-	-	1	5
Total	8	2	2	1	5	18
Soybean based production system						
Indore	4	1	-	-	1	6
Rewa	3	-	-	-	-	3
Total	7	1			1	9
Groundnut based production system						
Anantapur	5	2	-	-	-	7
Rajkot	-	2	-	-	2	4
Total	5	4	-		2	11
Cotton based production system						
Akola	-	1	-	-	1	1
Kovilpatti	3	2	2	-	1	8
Pharbani	3	-	-	-	-	6
Total	6	3	2		2	15
Grand Total	76	25	15	4	19	139

RTCP : Real time contingency planning : *RWM* : Rainwater management
EM : Energy management *ALU* : Alternate land use
SCHA: Soil health and conservation agriculture

Table-4: On-farm interventions

Production System/ Center	RTCP	RWM	SH	EM	ALU	TOTAL
Rice based production system						
Biswanath Chariali	6	3	2	1	2	14
Chianki	9	1	-	-	-	10
Faizabad	7	2	-	1	-	10
Jagadapur	7	2	2	6	1	18
Phulbani	4	2	1	-	3	10
Varanasi	11	2	1	2	1	17
Total	44	12	6	10	7	79
Maize based production system						
Arjia	5	3	-	1	3	11
Ballowal Saunkhri	6	2	1	1	3	13
Rakh Dhiansar	6	-	-	1	1	8
Total	17	5	1	3	7	33
Finger millet based production system						
Bangalore	5	4	2	1	1	13
Total	5	4	2	1	1	13
Pearl millet based production system						
Agra	6	2	1	1	2	12
Hisar	5	4	-	2	1	12
SK Nagar	3	2	-	1	-	6
Total	14	8	1	4	3	30
Sorghum based production system						
Bijapur	2	5	1	1	-	9
Solapur	2	-	1	1	1	5
Jhansi	2	3	1	1	1	8
Total	6	8	3	3	2	22
Soybean based production system						
Indore	5	2	-	1	2	10
Rewa	2	1	-	-	1	3
Total	7	3	-	1	2	13
Groundnut based production system						
Anantapur	6	3	-	1	2	12
Rajkot	6	2	-	1	2	11
Total	12	5	-	2	4	23
Cotton based production system						
Akola	2	2	1	1	-	7
Kovilpatti	3	2	2	-	3	10
Pharbani	3	2	1	1	-	9
Total	8	7	4	2	3	26
Grand Total	113	51	17	26	29	236

RTCP : Real time contingency planning ; *RWM* : Rainwater management
EM : Energy management *ALU* : Alternate land use system
SCHA: Soil health

The number of farmers and the area covered under each thematic area in NICRA villages is presented in (Table 5)

Table-5 : List of number of farmers under NICRA at different AICRPDA centers

Centre	RTC		RWM		SH		EM		ALU		Total No. of farmers	Total Area (ha)
	No. of farmers	Area (ha)	No. of farmers	Area (ha)	No. of farmers	Area (ha)	No. of farmers	Area (ha)	No. of farmers	Area (ha)		
Biswanath Chariali	215	40.00	70	11.00	300	200.00	-	-	13	-	598	251.00
Chianki	340	3.67	20	0.20	-	-	-	-	-	-	360	3.87
Faizabad	100	7.25	12	1.00	-	-	-	-	-	-	112	8.25
Jagdapur	163	55.00	8	4.00	-	-	65	24.40	5	5.00	241	88.40
Phulbani	50	14.50	8	3.00	2	0.50	-	-	16	4.25	76	22.25
Varanasi	139	33.40	25	9.25	4	1.00	8	2.00	4	0.75	180	46.40
Arjia	25	-	15	-	-	-	-	-	13	-	53	-
Ballowal Saunkhri	90	11.00	22	3.00	-	-	15	2.00	19	3.00	146	19.00
Rakh Dhiansar	134	7.05	8	-	-	-	5	1.00	8	0.40	155	8.45
Bangalore	159	39.14	26	4.09	132	1.49	-	-	2	1.00	319	45.72
Agra	60	24.00	26	15.20	-	-	-	-	22	22.00	108	61.20
Hisar	66	2.00	14	0.80	-	-	10	0.80	2	-	92	3.60
SK Nagar	144	58.25	28	11.52	-	-	13	5.26	-	-	185	75.03
Bijapur	23	9.20	14	3.60	-	-	-	-	-	-	37	12.80
Solapur	70	14.00	-	-	10	2.20	5	2.00	5	0.80	90	19.00
Jhansi	28	6.60	30	7.60	60	-	60	4.00	4	2.00	182	20.20
Indore	40	0.50	8	-	-	-	-	-	-	-	48	0.50
Rewa	234	64.80	21	4.20	-	-	-	-	24	4.80	279	73.80
Anantapur	311	124.40	19	17.60	-	-	20	20.00	12	-	362	162.00
Rajkot	183	49.20	38	14.40	-	-	45	18.00	13	5.80	279	87.40
Akola	34	13.60	24	9.60	6	2.40	71	28.40	-	-	135	54.00
Kovilpatti	10	5.60	10	4.00	-	-	-	-	6	0.80	26	10.40
Parbhani	48	26.40	13	5.20	16	16.00	1	0.40	-	-	78	48.00
Total	2666	609.56	459	129.26	530	223.59	318	108.26	168	50.60	4141	1121.27

RTCP : Real time contingency planning RWM : Rainwater management SCHA: Soil health
EM : Energy management ALU : Alternate land use system

Custom hiring centres

Each village has one Custom hiring centre (CHC), Climate Risk Management Committee (CRRMC) and Custom hiring Management Committee (CHMC) huge demand for these equipments in the Custom hiring centres. The need based implements based on the decisions at village level and approved by VCRMC, are made available for facilitating the hiring of implements as per the rates by CHMC. The money incurred from the custom hiring is maintained for maintenance and repair of the implements

Table-6: Improved implements available at Custom hiring centres in NICRA villages

Production System/Center	No. of implements available at Custom Hiring Centre
Rice based production system	
Biswanath Chariali	18
Chianki	-
Faizabad	4
Jagadapur	5
Phulbani	6
Varanasi	6
Maize based production system	
Arjia	-
Ballowal Saunkhri	8
Rakh Dhiansar	8
Fingermillet based production system	
Bangalore	19
Pearlmillet based production system	
Agra	8
Hisar	-
SK Nagar	14
Sorghum based production system	
Bijapur	7
Solapur	5
Jhansi	10
Soybean based production system	
Indore	4
Rewa	-
Groundnut based production system	
Anantapur	8
Rajkot	6
Cotton based production system	
Akola	-
Kovilpatti	6
Pharbani	7
Total	149

The productionsystem-wise and centrewise detailed technical programme is presented in the following chapters.