

MANDATE

- Basic and applied research on sustainable **farming** systems in the arid ecosystem.
- Repository of information on the state of natural resources and desertification processes.
- Livestock-based farming systems and range management practices for the chronically drought-affected areas.
- Generating and transferring location-specific technologies.

MISSION

Sustainable Arid Land Management

VISION

A greener, climate resilient arid land with well managed and sustainable agriculture that provides improved livelihood options and conserves scarce natural resources.

SIGNIFICANT ACHIEVEMENTS

- Integrated natural resources assessment and monitoring at 1:10k scale was done for Santara, Udasar and Budiwara villages in Barmer district. Land use change mapping (between 2006 and 2012) showed increase in kharif crop area in Santara by 8.49% and decrease in irrigated crop area in Udasar by 55.6%. In Budiwara cultivation of pomegranate increased from none in 2004 to 194 ha in 2013 to 238 ha in 2016
- Amongst silvipastoral systems studied, productivity of grass in various pastoral systems decreased when grown in combination with trees/shrubs except with ber.
- In the 23rd year of long term fertility trial, adoption of pearl millet - clusterbean rotation resulted in significantly higher grain and stover yield (767 and 1890 kg ha⁻¹) then continuous cropping of pearl millet.
- Productivity and energetic of agricultural production systems in Leh was worked out. At Phey and Nang villages input: output energy ratio was 3.1 for wheat and 0.1 for other vegetables.
- More than 20,000 trees of *Acacia senegal* were treated by CAZRI gum inducer during 2015-16 in 45 villages of Barmer, Jodhpur and Nagaur districts. Approximately 8.28 t of gum Arabic was produced which generated an additional income of Rs. 57.96 lacs for farmers.
- Analysis of total system productivity and economics of rejuvenated ber based system showed highest system productivity (102.37 q ha⁻¹) in Gola variety of ber + mung bean in 6 x 6 m spacing.
- Pearl millet populations (CZP 9603, CZP 9802 and CZP 923) and hybrids (CZH 233, CZH 227 and CZH 225) performed better under high temperatures of summer.
- In groundnut under Bikaner conditions, yield and water productivity performance indicated that 20% less irrigation application along with 30 kg N ha⁻¹ is sufficient to achieve optimum production.
- In Bikaner, highest plant height, total dry matter yield and grain yield of rainfed intercrops (moth bean,

clusterbean, and *L. indicus*) were recorded in intercropping with citrus.

- In Bhuj, the bacterial endosymbionts, *Bacillus subtilis* was found to increase pod and haulm yields of groundnut by 14.6 and 9.4% respectively over the control at 6EC of soil salinity.
- In organic farming system, on the basis of four year yield data, the highest yield of sesame and clusterbean were recorded with the integrated use of 4.5 t ha⁻¹ compost and 400 kg ha⁻¹ neem cake as soil application and spray of biopesticide of neem origin as and when required.
- The water requirement of Tharparkar and Rathi cattle indicated the average daily water intake of lactating stall fed and grazing cattle of Tharparkar was less during rainy, winter and summer season.
- Life cycle cost (LCC) analysis of solar PV pumping system showed that solar PV pumping system is beneficial to farmers. Annualized life cycle cost (ALCC) for 3 HP and 5 HP solar PV pumping systems were found less or almost same to that of electrified pumping system.

MILESTONE/OUTCOME

Consultancy for "Assessing Aeolian Hazard and its Possible Mangt. Strategies for Solar PV Plant Site at Badhla (Raj.), signed with NTPC Limited, New Delhi

LOCATIONS OF REGIONAL STATIONS

- Bikaner (Rajasthan); established in 1987
- Jaisalmer (Rajasthan); established in 1987
- Kukma-Bhuj (Gujarat); established in 1987
- Leh (J&K); established in 2012
- Pali (Rajasthan); established in 1987

FIVE BEST TECHNOLOGIES/PRODUCTS

- **Sand dune stabilization:** Technology spread to over 5 lakh ha
- **Shelterbelt plantation:** Covered a total length of 800 km along the IGNP
- **Management of arid watersheds:** Jhanwar model watershed recommendations adopted by the State, 5 million ha of area treated
- **Improved water harvesting structures for drinking/horti based farming systems:** The improved Tanka design adopted by the State under Rajiv Gandhi Drinking Water Mission. Over 10,000 structures have been constructed
- **Gum exudation from *Acacia senegal* technology:** The technology is available in the POP of the State and over 100,000 trees treated

CROP VARIETIES FROM CAZRI

Clusterbean: Maru Guar; Moth: Maru Moth, CZM-1, 2 & 3; Horse gram: Maru Mukati; Pearl millet: CZP 9802; Bird wood grass: Marwar Dhaman; Buffle grass: Marwar Anjan

NEW INITIATIVES

- Programme on Solar farming
- Collaborative work with ICARDA on water management

COLLABORATIVE PARTNERS

International: United Nations Convention to Combat Desertification; United Nations Organization for Education, Science and Culture (MAB Program); International Crops Research Institute for Semi-Arid Tropics; International Centre for Agricultural Research in the Dry Areas; Biodiversity International

National: Ministry of Environment and Forests, Govt. of India; Ministry of Earth Sciences, Govt. of India; Ministry of Rural Development, Govt. of India; Department of Science and Technology, Govt. of India; Department of Space, Govt. of India; Department of Biotechnology, Govt. of India; Indian Space Research Organization; University Grants Commission; National Medicinal Plant Board; National Bank for Agriculture and Rural Development; National Rainfed Area Authority; National Horticulture Mission; Protection of Plant Varieties and Farmers Right's Authority; Central Research Institute on Dryland Agriculture; Central Institute for Arid Horticulture; National Research Centre on Seed Spices; National Bureau of Plant Genetic Resources; Indian Institute of Natural Gums and Resins; Indian Institute of Technology, Mumbai; State line departments of Rajasthan, Gujarat and Jammu & Kashmir and Partnerships with SKUAST-K, Leh; CSKHPKV, Palampur; YSPUH&F, Solan; GBPIHED, Almora

FLAGSHIP PROGRAMMES

- Cold arid zone research
- Utilization of rainwater for crop production/farming systems in hot arid plains
- Grassland management and livestock production
- Dissemination of solar devices developed at CAZRI

THRUST AREAS FOR XII PLAN

- Biodiversity conservation and genetic improvement of annuals and perennials in arid regions
- Water and nutrient management studies in arid regions
- Renewable energy use in arid agriculture
- Evaluation of natural gum and resin yielding plants of arid regions
- Nano application in arid agriculture
- Hot arid and cold arid networks
- Technology assessment, refinement and training
- Implementation of MIS and FMS

EXTERNALLY FUNDED PROJECTS/CONSULTANCY

Foreign aided projects: 5
Other sponsored projects: 25

QRT

Period : 2010 to 2014

Chairman: Dr. B. Venkateswarlu

Next QRT due for: 2015 to 2019

STAFF STRENGTH

	Sanctioned	Filled	Vacant	% vacant
Scientific	141	92	49	35.00
Technical	265	190	75	28.00
Administrative	91	68	23	25.00
Supporting	271	195	76	28.00
Total	768	545	223	29.00

RAC

Period: 2016 to 2018

Chairman: Dr. J.S. Samara

Next RAC due for: 2019 to 2021

IMC

Period: 1.3.2015 to 28.2.2018

Chairman: Director, CAZRI

Next IMC due for: 27.2.2018 to 28.2.2021

RFD 7 COMPOSITE SCORE FOR 4 YEARS

Year	2011-12	2012-13	2013-14	2014-15
Score	99.5	98.0	94.00	92.00

STATUS OF ISO 9001

Certified/Not certified, if yes from where (Name of agency): Yes (31.07.2014)

PUBLICATIONS (PREVIOUS YEAR) Dr. Manish

No. of papers in NAAS rated journals:

- (a) No. of paper in score < 6: 23
- (b) No. of papers in score > 6: 26
- (c) Total 49/88
- (d) Per scientist per year papers: 0.55

FINANCIAL OUTLAY (Rs. in lakh)

	XI Plant actual utilization	XII Plant actual utilization	Last year budget		
			RE	Actual expenditure	% utilization
Plan	729.96		280.59	280.19	99.85
Non-plan	15845.08	2650 (1160.81)	7040.00	7037.72	99.97
Total	16575.04				

RESOURCE GENERATION FOR LAST 3 YEARS (RS. IN LAKHS)

2013-14	2014-15	2015-16
97.51	123.79	105.92

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