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CLIMATE-RESILIENT AGRICULTURE (CRA) IN INDIA-I

Understanding Climate-Resilient Agriculture

FAO defines Climate-resilient Agriculture (CRA) as "**the capacity of agricultural systems** to **anticipate, adapt to, absorb, and recover from climate change impacts** and extreme weather."

In simple words, CRA is a farming approach that helps farmers **adapt to climate change, reduce risks from extreme weather, and sustain productivity**.

Why is CRA Critical

Climate change affects Indian agriculture through:



Erratic rainfall and weather patterns, strong cyclones and flooding, or delayed monsoons



Droughts and extreme, long heatwaves



Soil degradation, pest infestations and declining agricultural productivity

These events threaten **farm incomes, food security, and rural livelihoods**, especially for smallholders. CRA provides practical ways to **reduce vulnerability** and **strengthen adaptive capacity**.

CRA builds resilience to both **slow-onset events** (rising temperatures) and **sudden shocks** (floods) to secure food production. It teaches use of **climate-smart crops, better water and soil practices, and diversified livelihoods** to protect farms, incomes, and food security despite changing climate conditions.

Core Pillars of CRA

Diversified Livelihoods 1



Promote crop diversification, livestock, fisheries, and non-farm income

Reduce dependence on a single source of income

Natural Resource Management 2



Efficient use of soil, water, and biodiversity

Promote sustainable and climate-smart agricultural practices

Community-Based Approaches 3



Collective action through Self-Help Groups (SHGs), Farmer-Producer Organizations (FPOs), and village institutions

Strengthen local decision-making and resilience

Key Message Investments in resilience yield economic, social, and environmental returns.

Strategic Approaches

Climate-Resilient Cropping Systems



Promote stress-tolerant, pest-resistant varieties (drought, flood, heat and pests)

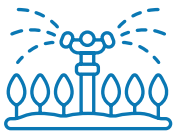


Region-specific crop planning incorporating weather outlook specific to defined 15 Agro-climatic Zones (ACZs)



Encourage millets (*Bajra, Jowar, Ragi*, small millets), and varieties of pulses rice, wheat that tolerate submergence, drought or withstand heat and pests, and yet give high yields.

Water Resource Management



Micro-irrigation (drip or sprinkler)



Mulching, rainwater harvesting and groundwater recharge



Watershed-based planning

Soil Health Management



Conservation agriculture (zero tillage, residue management)



Organic inputs and reduced chemical dependency



Practices: mulching, cover cropping, intercropping

Integrated Farming Systems (IFS)



Crop + livestock + fishery + horticulture integration



Resource recycling and risk diversification

Nature-Based Solutions (NbS)



Agroforestry and tree-based integrated farming systems



Wetland, pasture restoration and conservation



Riverbank stabilization using vegetation

Technology and Innovation



Work on climate-resilient indigenous seeds, plant varieties, *desi* livestock breeds



Artificial Intelligence (AI)-based weather advisories available to common man over different platforms



Internet of Things (IoT) and Geographical Information Services (GIS) for precision agriculture and monitoring progress.



Drones for monitoring and input application

Green Technologies



Low-cost polyhouses



Renewable energy-based cold storage



Energy-efficient irrigation systems

Outcomes



Higher productivity



Reduced input costs



Stable income and family food security despite extreme weather



Final Takeaway- Seed the Change

Climate-Resilient Agriculture is essential for ensuring sustainable productivity, farmer resilience, and long-term food security in India.

FROM POLICY TO PLATE: BUILD CLIMATE-RESILIENT FARMING

Every suitable field intervention contributes to national climate resilience.

References

1. ICAR-CRIDA
   Link: https://www.icar-crida.res.in/

2 NICRA -ICAR
   Link: https://www.nitiforstates.gov.in/public-assets/Policy/policy_files/PNCNAA000616.pdf

3. District Level Agriculture Contingency and Drought Proofing Plan for Mitigation and adaptation to climate change; ICRISAT.
   Link: https://issca.icrisat.org/scalable-solutions/district-level-agriculture-contingency-and-drought-proofing-plan-for-mitigation-and-adaptation-to-climate-change

4. National Mission for Sustainable Agriculture (NMSA).
   Link: https://nmsa.dac.gov.in/

5. PMKSY (Per Drop More Crop)
   Links: https://pmksy.gov.in/microirrigation/index.aspx and https://pdmc.da.gov.in/

6. Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)
   Link: https://pmksy.gov.in/Default.aspx

7. Seed Village Program (Beej Gram Yojana). Link to short note on facilities under various seed schemes: https://seednet.gov.in/Material/Prog-Schemes.htm and Seeds Division of Department of Agriculture and Farmers Welfare: https://agriwelfare.gov.in/en/SeedsDiv