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Seminar I
NICRA– Enhancing Resilience to Climate Stress in Agriculture
Synopsis

International Panel on Climate Change (IPCC) in its Fifth assessment report observed that ‘Warming of climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and oceans have warmed, the amount of snow and ice have diminished, and sea levels risen’. As per the latest IPCC report, earth is warmer by 0.75°C since pre-industrial time (1850). The years 1995–2006 had 12 warmest years since 1850. India accounts for 4.5% of the total global GHG emissions, and as per COP21 Paris Agreement, India is committed to reduce Green House Gas emissions by 33–35% from the levels on 2005. This goal has to be achieved by 2030. The impacts of climate change are global, but countries like India are highly vulnerable in view of its large population depending on agriculture. The predicted temperature rise for India is in the range of 0.5–1.2°C by 2020, 0.88–3.16°C by 2050 and 1.56–5.44°C by the year 2080, with different regions expected to experience differential change in the amount and distribution of rainfall.

Agriculture sector contributes to about 17.4% of India’s GDP. Studies have indicated significant negative impacts of climate change in India, predicted to reduce yields by 4.5 to 9.0 %, depending on magnitude and distribution of warming. A 4.5 to 9% negative impact on production implies a cost of climate change to be roughly up to 1.5% of GDP per year. Therefore, Govt. of India has accorded high priority on research and development to cope with climate change in general and agriculture in particular. To meet the challenges of sustaining domestic food production in the face of changing climate, to generate technologies towards adaptation and mitigation of climate change in agriculture to support and articulate the country’s views at different global fora like United Nations Framework Convention on Climate Change (UNFCCC), the Indian Council of Agricultural Research (ICAR) launched a flagship network project ‘National Initiative on Climate Resilient Agriculture’ (NICRA) during XI Plan in February 2011, and in the current Plan period it is referred to as ‘National Innovations in Climate Resilient Agriculture’ (NICRA).

Keeping these aspects in view, the present seminar has been conceptualized with the following objectives.

1. To know concept of NICRA project
2. To understand the importance, components and impact of the NICRA in agriculture.
3. To know the challenges faced and strategies to overcome the challenges
4. To review the related case studies and research studies.

Concept of NICRA project: To enhance the resilience of Indian agriculture covering crops, livestock and fisheries to climatic variability and climate change through development and application of improved production and risk management technologies. To demonstrate site specific technology packages on farmers’ fields for adapting to current climate risk and to enhance the capacity building of scientists and other stakeholders in climate resilient agricultural research and its application.

Implementation: The project is implemented in one representative gram panchayat in each of the 121 districts (100+21) selected based on major climatic vulnerability viz. drought, floods, heat wave, cold wave, frost and cyclones. The project is implemented by Krishi Vigyan Kendra’s (KVKs) at district level, regionally coordinated by Agricultural Technology Application Research Institute (ATARI) with overall planning monitoring and coordination by CRIDA, Hyderabad.

NICRA project components: 1) Strategic research on adaptation and mitigation.2) Technology demonstration on farmers' fields to cope with current climate variability.3) Sponsored and competitive research grants to fill critical research gaps.4) Capacity building of different stake holders

Impact: NICRA interventions increase resilience at farm, household and village levels, and is helping farmers to cope with extreme weather like droughts, floods, frost, cold and heat waves. Impact of the project is observed through improvement in different modules like crop production, natural resource management, livestock and fisheries, extension activities which are location specific.

Benefits: Promising resilient technologies will be incentivized and integrated with the developmental programs of different Ministries to reach large numbers of farmers, establish more climate resilient villages, reduce emissions and secure livelihoods of farmers under changing climate conditions.

Challenges and Strategies: NICRA aims to make Indian villages climate-proof, is at crossroads due to a lack of strategy for expansion along with other reasons such as handholding without long-term vision, the larger landscape, not adapting to change, right on diagnosis- low on treatment, struggling for direction (Finance), participatory evaluation is not considered, funds are not distributed equitably among the KVKs and little integration. Focusing on treatment along with diagnosis through appropriate expansion strategies, financial and hand holding support for implementation, integration among institutions and distribution of funds at right time is need of the hour.

Research studies

Charitha (2017) recorded that nearly half of the (47.50 %) of the non-beneficiary farmers belonged to the low overall impact category, whereas, 42.50 per cent of the beneficiary farmers comes under the high overall impact category. Significant percentage of beneficiary farmers have adopted the climate resilient practices like drip irrigation (80.00 %), crop diversification (72.50 %), earthing up in red gram (57.50 %), use of early maturing and drought tolerant high yielding varieties like ML-365, MR-6 (52.50 %) and establishment of fodder bank (31.25 %) compared to non-beneficiaries.

Sasanka *et al.* (2022) elucidated that out of 120 farmers, more than 4/5th have very good and 15.8% have good satisfaction with the NICRA project for employment generation. The NICRA farmers have significantly higher incomes than non-NICRA farmers

Conclusion: NICRA is a unique project, which brings all sectors of agriculture on one platform for addressing climate concerns. It is very important to sustain the efforts made in the past few years and take forward the project for some more years. Though there are some positive lessons and experiences emerging out of technology demonstration component, there is still considerable need to continue this activity to identify and demonstrate technologies that help deal with climate change. Further system-wide impacts and responses to climate change need to be understood more comprehensively. The efforts in this direction, which have begun recently have to be taken through their logical course, for such, an understanding is necessary to identify and prioritize various adaptation options.

References

- CHARITHA V. GOPAL, 2017, Impact of national innovations on climate resilient agriculture (NICRA) on the rural livelihood security of farmers of Chikkaballapura district. *M. Sc. (Agri.) Thesis, (Unpub.)*, Univ. Agric. Sci., Bangalore.
- SASANKA LENKA, R. S., PANIGRAHI, B. B., NANDA, B. R., PATTANAIK, AND SATPATHI, A., 2022, Impact of national innovation of climate resilient agriculture (NICRA) project on raising the income and employment level of farmers in the operational districts of Odisha. *Biological Forum- An International Journal*, **14**(2): 217-222.