

# NATIONAL INNOVATION ON CLIMATE RESILIENT AGRICULTURE (NICRA)

The number of KVKs under NICRA-TDC is 15 in all the five states of ICAR-ATARI, Zone-VII, Umiam. The interventions conducted by the KVKs in the adopted NICRA villages focused mainly on the identified farming system typologies (FSTs) and how to mitigate climate related problems in the particular location. The FSTs were identified based on the climatic constraints faced by the district so that mitigation techniques could be applicable to all the farming villages in the district.

The list of KVKs, adopted villages, identified FSTs and number of farmers is as follows:

Sl. No.	State	KVK (District)	Adopted village(s) (year of adoption)	Identified Farming System Typologies (Number of farmers)
1.	Manipur	Senapati	Hengbung (2011), Mayangkhang (2017), T.Khullen (2021)	Rainfed upland without animals with mild slopes (23), Rainfed upland with animals with mild slopes (24), Hills with steep slopes (22)
2.		Ukhrul	Ramva (2015), Lungsang (2019), Kazipphung (2022)	Rainfed Upland (Hills with steep slopes) (6), Rainfed Upland without animal (Hills with mild slopes) (7), Rainfed Upland with animal (Hills with mild slopes) (6)
3.		Chandel	Lambung (2021)	Steep slopes without animals (10), Plain area without animals (10), Plain area with animals (10)
4.	Meghalaya	West Jaintia Hills	Namdong (2017), Wahiajer (2022)	Rainfed upland with animal (Hills with mild slopes) (25), Plains in the valleys with animals (22)
5.		Ri Bhoi	Thadnongiaiw (2021)	Mid altitude rainfed system without animal component (9), Low land rainfed farming system with animal component (80)
6.		West Garo Hills	Marapara (2012), Sananggre	Rainfed midland with animal (Hills with mild slopes) (38), Rainfed

			(2012), Rongbokgre (2012), Bagugre (2019), Rimranggre (2019)	lowland with animal (47), Rainfed Jhum land without animals (16)
7.		South Garo Hills	Asugre (2022)	Rainfed midland with livestock (10), Rainfed lowland with livestock (10), Irrigated lowland with livestock (10),
8.	Mizoram	Lunglei	Hnahthial (2011), Thiltlang (2015), Tuipui D (2016), Cherhlun (2019), S. Vanlaiph (2020)	Rainfed upland with animal (Hills with steep slope) (213), Plain in the valleys without animal (50)
9.		Serchhip	N. Vanlaiphai (2015), Lungchhuan (2015), Chekawn (2015)	Rainfed upland (Hills with steep slopes) (24), Rainfed upland without animals (Hills with mild slopes) (67), Rainfed upland with animals (Hills with mild slopes) (8), Plains in the valleys without animals (4)
10.		Saiha	Tisopi (2021)	Rained Upland with animal (Hills with steep slopes) (16), Rained Upland without animal (Hills with mild slopes) (4), Rained Upland with animal (Hills with mild slopes) (7)
11.		Lawngtlai	Chawnhu (2021)	Rainfed upland with animal (Hills with steep slopes) (10), Rainfed upland with animal (Hills with mild slopes) (10)
12.	Nagaland	Mon	Ngangching (2015), Sowa Changle (2019), Langmeing (2021), Totok Chingha (2021)	Rainfed with & Without Livestock, Hills with Steep Slope (20), Rainfed with & without Livestock, Hills with Steep Slope (20), Rainfed with & without livestock, Hills with Mild Slope (30), Rainfed with & without Livestock, Hills with Mild Slope (30)
13.		Phek	Thipuzu (2011), K. Basa (2017), Phusachodu (2018), Kikruma (2018),	Rainfed Upland with animal (13), Rainfed Upland without animal (14), Rainfed Midland with animal (10), Rainfed Midland without animal (13)

			Pfutseromi (2022)	
14.		Tuensang	Chendang (2022), K.Wongthu (2022)	Rainfed upland with animal (53), Rainfed lowland with animal (15)
15.	Tripura	Sepahijala	Golaghati (2021)	Irrigated Land with Livestock (10), Irrigated Land without Livestock (10), Rainfed Land without Livestock (10), Rainfed Land with Livestock (10)

### **Climate vulnerability in the different districts**

<b><i>State</i></b>	<b><i>District</i></b>	<b><i>Vulnerability</i></b>
<i>Manipur</i>	Chandel	Drought/water stress
	Senapati	
<i>Meghalaya</i>	Ukhrul	Frost /Soil Erosion
	Jaintia Hills	Drought/ Cold wave
	Ri-Bhoi	Drought / water stress Frost / Hailstorm
	South Garo Hills	Drought/water stress/ Cold wave
	West Garo Hills	Drought/water stress
<i>Mizoram</i>	Lawngtlai	Drought/water stress/ Cold wave
	Lunglei	Water stress
	Saiha	Drought/water stress/ Cold wave
	Serchhip	Drought
<i>Nagaland</i>	Phek	Drought/water stress
	Mon	Drought/ Soil erosion
	Tuensang	Drought/ Cold wave/ Frost
<i>Tripura</i>	Sepahijala	Flood/ Soil erosion

### **Climate Resilient Technologies adopted in the NICRA Villages**

The climate resilient interventions/ technologies adopted by the KVKs in the NICRA adopted villages for mitigating the effects of climate change are grouped as per the following:

- Interventions under natural resources management (NRM) – Climate resilient technologies under this group include moisture conservation techniques such as utilization of mulch (bio/plant residue and plastic), water harvesting in farm ponds, renovation of old water storage structures; improved cropping methods such as ridge and furrow method of cultivation and broad bed and furrow method

of cultivation in low lying areas; soil management and improvement through zero tillage and composting, integrated nutrient management; and protected cultivation.

- Interventions under crop improvement - Climate resilient technologies under this group include the use of improved crop varieties such as high yielding varieties, flood, heat and cold tolerant varieties, varieties with lower duration; altering the sowing date of crops to meet the desired climatic requirement for enhanced crop performance and economics; improved method of sowing paddy such as SRI and DSR; intercropping systems etc.
- Interventions under livestock and fisheries - Climate resilient technologies under this group include rearing of improved breed of livestock that could withstand adverse climatic conditions without compromising the productivity in terms of meat, milk, eggs etc.; construction of low-cost improved shelters to reduce the incidence of diseases in livestock; nutrient management, improved feeding methods and regular health camp especially during monsoon season; composite fish culture etc.

### **Successful adopted technologies in the NICRA Villages**

- Moisture conservation through in-situ and ex-situ methods.
- Paddy straw/ poly-mulching in vegetable crops to minimize the frequency of irrigation and check the growth of weeds during early crop stages.
- Advancement the sowing date of rabi crops to escape extreme drought conditions.
- Cultivation of high yielding, short to mid-duration paddy so as to facilitate early planting of rabi crops to maximize the utilization of available soil moisture.
- Cultivation of high value crops in protected low-cost structures for better performance and yield, which would otherwise damage the crops cultivated in open conditions during aberrant climate conditions.
- Improved methods of cultivating crops such as raised beds and furrows in low lying areas to minimise the impact of floods.
- Custom Hiring Centres for maximizing the cropping intensity and cutting down the cost of cultivation by reducing the labour requirement in man-days.

- Cultivation of improved crop varieties, resistant to pests and diseases, flood, heat, cold, frost etc.
- Rearing of improved breeds of livestock which are more productive to the farmers.
- Composite culture of improved fish species instead of mono culture.
- Rearing of livestock in improved shelters to limit the impact of extreme climate conditions prevailing in the region.
- Improved feeding methods in livestock and regular health camps to minimize the incidences of diseases in livestock during wet period.

### **Strategy for the future**

- Development of strategic approach for proper climate resilient approach in the field of agriculture
- Equipping farmers with latest technologies regarding scientific approach to farming in relation to Climate Change
- Striving towards attaining perfection in predicting trends of weather pattern in a given area
- Support farmer-to-farmer and community-wide social learning
- Adoption of climate-smart agriculture across different scales
- Popularization of climate-smart soil and land health
- Setting up of target and pathways to scale out climate-smart agricultural technologies to farming communities
- Formulating equitable climate-smart agricultural policies, which is the need of the hour