Annual Report 2023

ICAR-Agricultural Technology Application Research Institute Zone-VII
Umiam, Meghalaya-793103

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PREFACE

Greetings from Team ICAR-ATARI, Umiam!

The ICAR- Agricultural Technology Application Research Institute (ATARI), Umiam, headquartered in Umiam, Meghalaya, holds the primary responsibility of systematically coordinating, monitoring, and reviewing mandated activities across five North Eastern Hill States of India—Manipur, Meghalaya, Mizoram, Nagaland, and Tripura. These activities include technology assessment, demonstrations, planting material production, training programs, and various extension activities involving 43 Krishi Vigyan Kendras (KVKs). Additionally, the institute is actively formulating and implementing need-based research projects to strengthen agricultural extension research and knowledge management.

In the fiscal year 2023, the institute, in collaboration with selected KVKs, research institutes, and agricultural universities, successfully executed five funded projects. These projects encompassed diverse areas such as National Innovations on Climate Resilient Agriculture (NICRA), Attracting and Retaining Youth in Agriculture (ARYA), Farmer FIRST Programme (FFP), and Cluster Frontline Demonstration (CFLD) on Oilseeds and Pulses under NMOOP/NFSM through different KVKs in the zone. Special programs, including Poshan Maah Celebration, Jal Shakthi Abhiyan, Skill development, Micro-irrigation, Natural farming, Soil and water testing, MGMG etc. were also effectively implemented during this reporting period.

Throughout the year, KVKs in the zone conducted 438 On-Farm Testing (OFTs) and refined 10 technologies. Furthermore, a total of 4831 Frontline Demonstrations (FLDs) were organized in crops, livestock, and enterprises across the states of Manipur, Meghalaya, Nagaland, Tripura, and Mizoram. The KVKs played a crucial role in organizing 3474 training courses, benefitting 90059 farmers, farm women, rural youth, and extension personnel. Moreover, 19041 extension programs and activities were organized to reach over 186410 farmers and other targeted beneficiaries, including individuals from general and SC/ST categories of farmers, as well as extension personnel in the region. The extension activities conducted by KVKs were classified into five major groups: field trips and visits, group activities, mass outreach programs, camps and campaigns, and publications. Notably, KVKs produced 5160.24 quintals of quality seeds, 1,742317 nos. of planting materials, 453.57 quintals of bio-products, and 13.62 lakh of livestock and fingerlings.

This document aims to spotlight the significant achievements of the institute and the KVKs during the year 2023. I express my sincere thanks and gratitude to Dr. Himanshu Pathak, Secretary, DARE & DG, ICAR, Govt. of India, Dr. U.S. Gautham, DDG (AE), Dr. R. R. Burman, ADG (AE), Dr. R. K. Singh, ADG (AE) and all the colleagues of Agricultural Extension Division in the Council HQ for their constant encouragement, guidance and support in executing the mandates of the institute. Special acknowledgment is extended to Dr. A. K. Singha (Pr. Scientist), Dr. R. Bordoloi (Pr. Scientist), Dr. Amrutha, T (Scientist), and their entire team, including project staff, for their commendable efforts in producing this publication within the stipulated time.

Place: Umiam, Meghalaya

Date:

(Dr. A.K. Mohanty)

CONTENTS

EXECUTIVE SUMMARY

The ICAR-Agricultural Technology Application Research Institute (ATARI), Zone-VII, which oversees 43 Krishi Vigyan Kendras (KVKs) spread across five North Eastern states including Manipur, Meghalaya, Nagaland, Mizoram, and Tripura, has been diligently working to meet the diverse needs of various stakeholders, particularly farmers in the region. The institute has received valuable support from the Directorate of Extension Education of Central Agricultural University, Imphal, and 12 host organizations. This collaboration has enabled the Institute to address the requirements of different stakeholders, providing technological and methodological support, information, skill enhancement, and entrepreneurship development in crops and livestock enterprises.

In the fiscal year 2023-24, the institute has been executing five externally funded projects in conjunction with selected KVKs, research institutes, and agricultural universities. These projects encompass National Innovations on Climate Resilient Agriculture (NICRA), Attracting and Retaining Youth in Agriculture (ARYA), Farmer FIRST projects (FFP), and Cluster Demonstrations on Oilseeds and Pulses under NMOOP/NFSM. Additionally, special programs like Poshan Maah Celebration, Jal Shakthi Abhiyan, Skill development, Micro-irrigation, Natural farming, Soil and Water Testing, and MGMG scheme have been effectively implemented during this reporting period.

Throughout the year, a total of 438 On-Farm Trials (OFTs) were conducted through 2550 trials by KVKs of ATARI, Barapani. These covered 342 OFTS on crops and 96 OFTs on livestock and fisheries. The KVKs refined a total of 10 technologies during this period, comprising 7 crop-based technologies with 70 trials and 3 livestock and fishery-based technologies with 14 trials.

KVKs of ATARI Zone VII played a pivotal role in conducting 4831 frontline demonstrations, covering crops, livestock, fisheries, agri-based industries, and farm implements over an area of 1280.7 hectares. These demonstrations spanned various categories, with a focus on cereals, millets, pulses, oilseeds, vegetables, fruits, spices, tuber crops, and crop hybrids.

Training remained a crucial activity, with KVKs organizing 16730 training programs in 2023, benefiting 90059 participants, including farmers, farm women, rural youth, and extension personnel. Sponsored training programs were also conducted, totaling 415 sessions and benefiting 8,969 participants. These covered critical areas such as crop production, post-harvest and value addition, livestock and fisheries, and income generation activities.

In terms of extension activities, KVKs utilized traditional and modern means of technology dissemination, including Information and Communication Technologies (ICTs). A total of 3474 extension programs and activities were conducted in the reporting year.

During the reporting period, KVKs produced substantial quantities of quality seeds, planting materials, bio-products, and livestock and fingerlings. Notably, the institute also organized an annual action plan workshop and an Annual Zonal Workshop of KVKs in 2023 to formulate, finalize activities, and review progress.

Efforts were also directed towards strengthening the Directorate of Extension Education (DEE) and Agricultural Technology Information Centres (ATIC) under the zone through regular monitoring mechanisms. This included participation in various scientific advisory committee meetings, field days, workshops, technological weeks, training programs, On Farm Trials, and Frontline Demonstrations.

As part of their additional support to farmers, KVKs conducted laboratory-based analysis of soil, water, and plant samples. A total of 14,756 samples were analyzed, benefiting 18,625 farmers across 707 villages.

The institute contributed to knowledge dissemination through publications, including two technical bulletins and one research paper at the ATARI level. KVK staff contributed significantly with 14 research articles, 78 popular articles, 68 training manuals, 40 extension folders, 94 leaflets/pamphlets, 10 technical bulletins, 13 CD/DVD/YT videos, and 111 newspaper coverage, covering various technological aspects of agriculture and allied enterprises.

1 Introduction

Genesis of ICAR-Agricultural Technology Application Research Institute (ATARI)

The Indian Council of Agricultural Research (ICAR) established eight Zonal Coordinating Units (ZCUs) in 1979 as part of the Lab-to-Land program, with a staff strength of six individuals in each unit. Their primary purpose was to implement the program to reach 50,000 farm families nationwide. During the VIIIth Plan (1992-1997), when the total number of KVKs reached 261, the ICAR adjusted the staff strength of Zonal Coordinating Units to fifteen members. Throughout the XIth Plan, each Zonal Coordinating Unit managed an annual budget averaging around Rs. 55 crores. To efficiently manage the growing number of KVKs, the Zonal Coordinating Units were elevated to Project Directorates, known as Zonal Project Directorates (ZPD), with sanctioned staff strength of 17, effective from March 19, 2009.

Considering its revised mandates, the ZPD was further promoted to the status of a research institute, officially named the Agricultural Technology Application Research Institute (ATARI), on August 11, 2015.

ICAR-Agricultural Technology Application Research Institute (ATARI), Zone-VII

The ICAR-Agricultural Technology Application Research Institute (ATARI), Zone-VII, headquartered in Umiam, Meghalaya, has the primary responsibility of monitoring and reviewing technology assessment, refinement, demonstration, training programs, and other extension activities conducted by Krishi Vigyan Kendras (KVKs) in the Northeast Hills Region. This region comprises five states: Manipur, Meghalaya, Mizoram, Nagaland, and Tripura. Additionally, the institute plays a crucial role in guiding KVKs to fulfill their technical activities, ensuring seamless flow and access to technologies for these KVKs. ICAR-ATARI, Zone-VII, is actively involved in providing need-based Human Resource Development (HRD) programs for KVK staff, backed by adequate financial support. It also engages in liaison with various stakeholders and collaborates with other line departments in the region. At present, this zone oversees 43 KVKs operating under 12 different host institutes (Table 1.1).

Table 1.1: State and host organization-wise KVKs under ICAR-ATARI Zone VII, Umiam

State	KVKs (No.)	Host Institutions
Manipur (9)	1	UJFPCS, Bishnupur, Manipur (NGO)
	5	ICAR RC for NEH Region, Barapani
	1	CAU Imphal, Manipur
	1	FEEDS, Hengbung (NGO)
	1	State Dept of Agriculture
Meghalaya (7)	3	State Dept of Agriculture
	2	ICAR RC for NEH Region, Barapani
	2	CAU Imphal, Manipur
Mizoram (8)	1	CAU Imphal, Manipur
	7	State Dept. of Agriculture
Nagaland (11)	5	ICAR RC for NEH Region, Barapani
	4	State Dept. of Agriculture
	1	NRC on Mithun
	1	Nagaland University
Tripura (8)	4	State Dept of Agriculture
	2	ICAR RC for NEH Region, Barapani
	1	Rama Krishna Seva Kendra (NGO), Kolkata
	1	CAU Imphal, Manipur
Total	**43**	

Mandates of the Institute (ATARI)

- Coordination and monitoring of technology application and frontline extension education programmes, and
- Strengthening agricultural extension research and knowledge management.

Major functions of the Institute

- Planning, monitoring, and reviewing of KVK activities in the zone; to identify, prioritize and implement various activities related to technology integration and dissemination.

Profile of the Institute

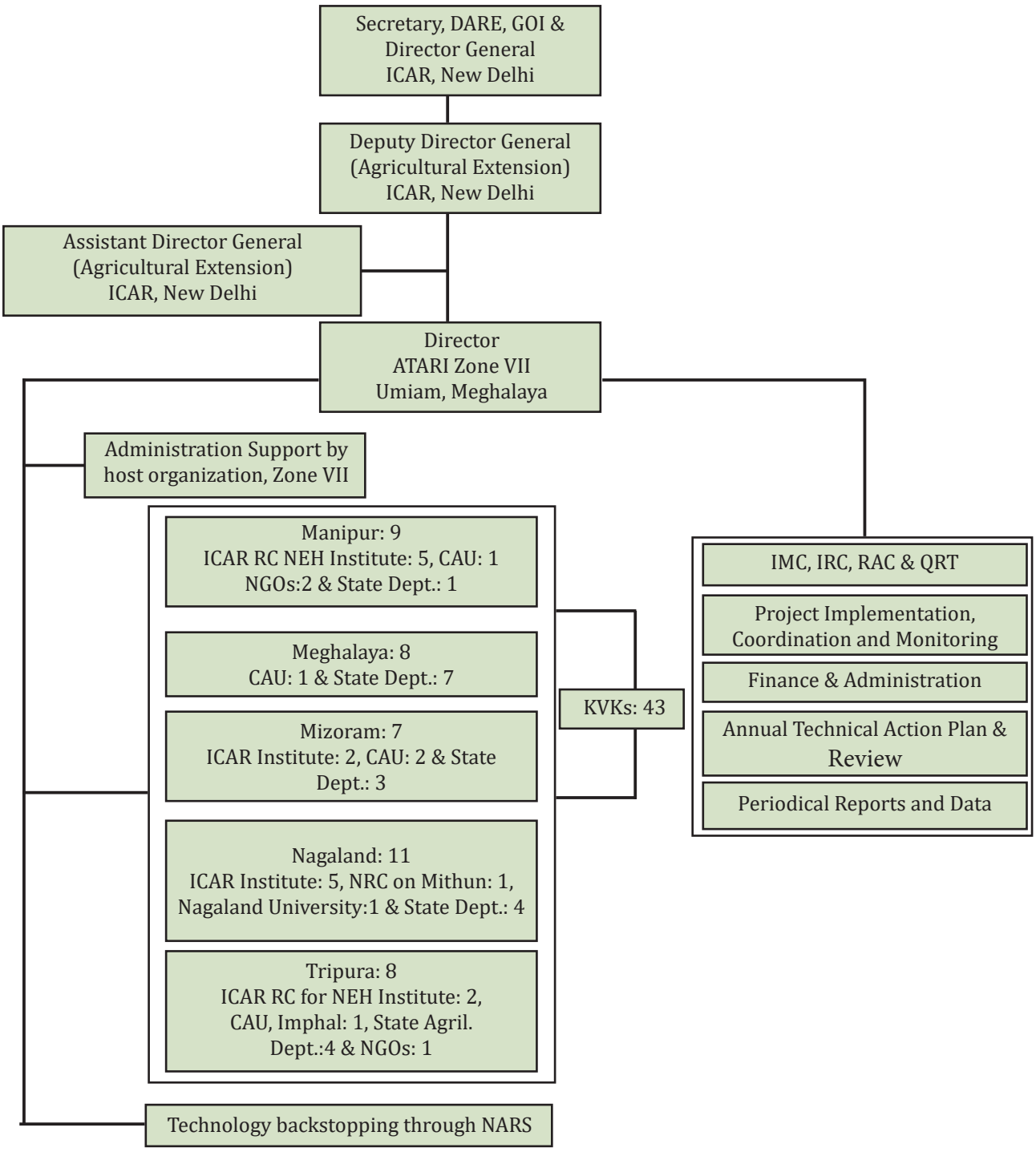


Fig 1.1: Organizational Structure of ICAR-Agricultural Technology Application Research Institute (ATARI), Zone-VII

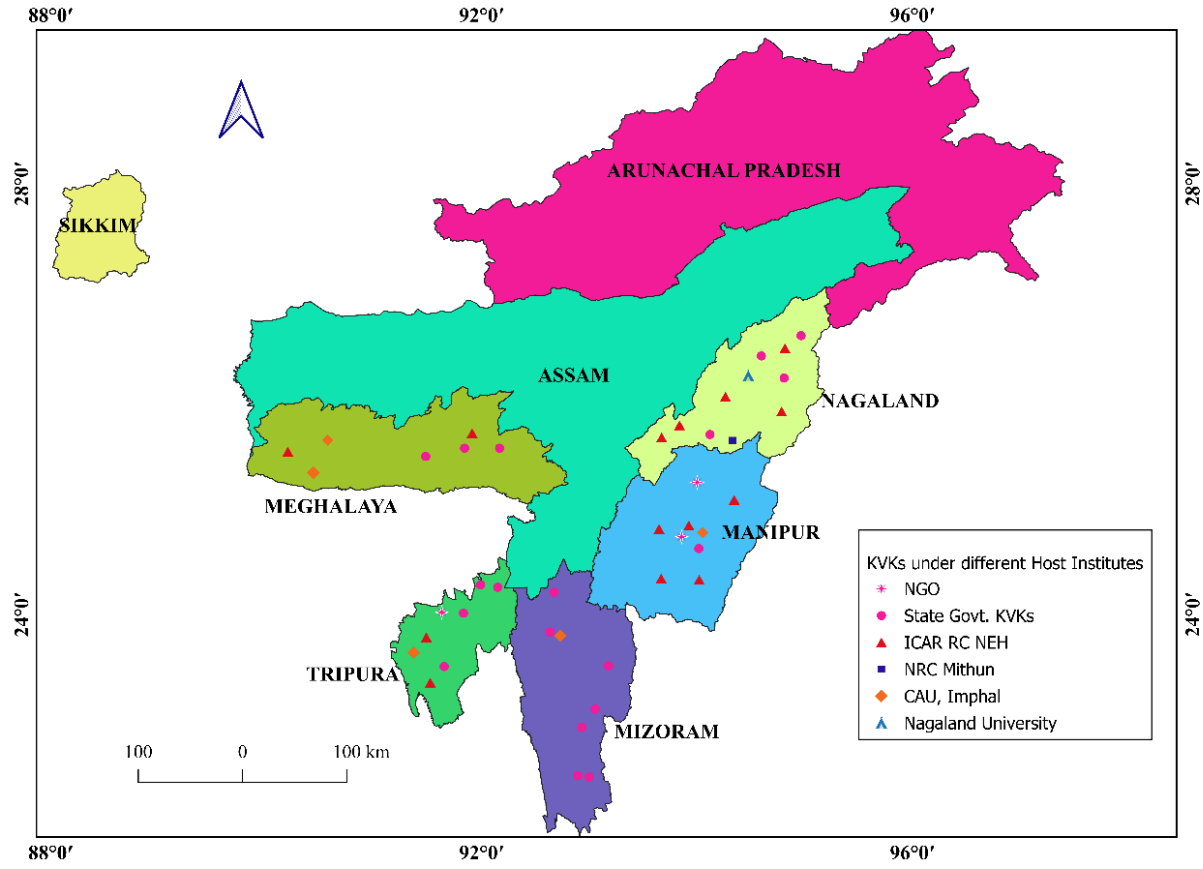


Fig 1.2: Operational Area and Network of KVKs under ICAR-ATARI ZONE-VII, Umiam

Staff Position of Agricultural Technology Application Research Institute (ATARI),Zone-VII

Out of the sanctioned staff strength of 20, presently the Agricultural Technology Application Research Institute, Zone-VII has 10 staff in the position. The details of the staff position of the institute are given in Table 1.2.

Table 1.2: Present Staff Position of Agricultural Technology Application Research Institute, Zone-VII

Sl. No.	Category	Sanctioned Strength	In Position	Vacant
1	Director	1	1	0
2	**Scientific Post**			
	Principal Scientist	2	2	0
	Senior Scientist	3	0	3
	Scientist	2	2	0
	Total	**8**	**5**	**3**

3	**Technical Staff**			
	Chief Technical Officer	1	1	0
	Technical (T-1)	1	1	0
	Driver	1	0	1
	Total	**3**	**2**	**1**
4	**Administrative Post**			
	Assistant Finance & Accounts Officer	1	0	1
	Assistant Administrative Officer	1	1	0
	Private Secretary	1	1	0
	Assistant	2	1	1
	Personal assistant	1	1	0
	U.D.C	1	0	1
	Stenographer Grade-III	1	0	1
	LDC	2	0	2
	Total	**10**	**4**	**6**
5	Supporting Staff			
	(SSG-I, II, III, IV)	2	**1**	1
	Total	**2**	**1**	**1**
GRAND TOTAL				

Ongoing Research Projects

Project: Cultural Diversity of Ethnic Foods of Indigenous Tribes in NEH : A Socio-Economic Analysis.

PI- Dr. Amrutha, T, Scientist, ICAR-ATARI, Umiam

Co-PI: A. K. Mohanty, Director, ATARI, Umiam

Dr. A. K. Singha, Principal Scientist, ATARI, Umiam

Dr. R. Bordoloi, Principal Scientist, ATARI, Umiam

The primary focus of the project is to document traditional foods and their economic significance in improving livelihoods. We collected primary data from women representing five states: Manipur, Meghalaya, Mizoram, and Nagaland. Currently, we are in the process of entering and cleaning the data.

New Extension Methodologies and Approaches (NEMA)

The ICAR-sponsored project- **"New Extension Methodologies and Approaches**

(NEMA)" was associated with generating data on the adoption of selected improved technologies, the determinants of adoption, constraints and impact from a large pool of samples across the country for generalization and drawing meaningful conclusion is conceived with the following objectives-

- To study the extent and determinants of adoption of selected improved NARS technologies
- To develop a technology map for different agro-ecosystem
- To assess the impact of the technologies in different agro-ecosystem
- To undertake yield gap analysis and suggest suitable strategies to reduce gaps

At present, ATARI, Umiam is associated with eight (8) National network projects under the purview of **New Extension Methodologies and Approaches (NEMA**). These Network projects are Climate change, Gender and Nutrition, Residue Management, Doubling Farmers' Income (DFI), Tribal Sub-Plan (TSP), Aspirational Districts, ARYA network project and Pulses Network Project, having financial provisions under different projects for proper implementation of the project. The Scientists of ICAR-ATARI, Umiam were actively involved in these projects as Co-PI. The achievements of these network projects are presented in the last RAC meeting held at ATARI -Bengaluru by respective leading ATARI's.

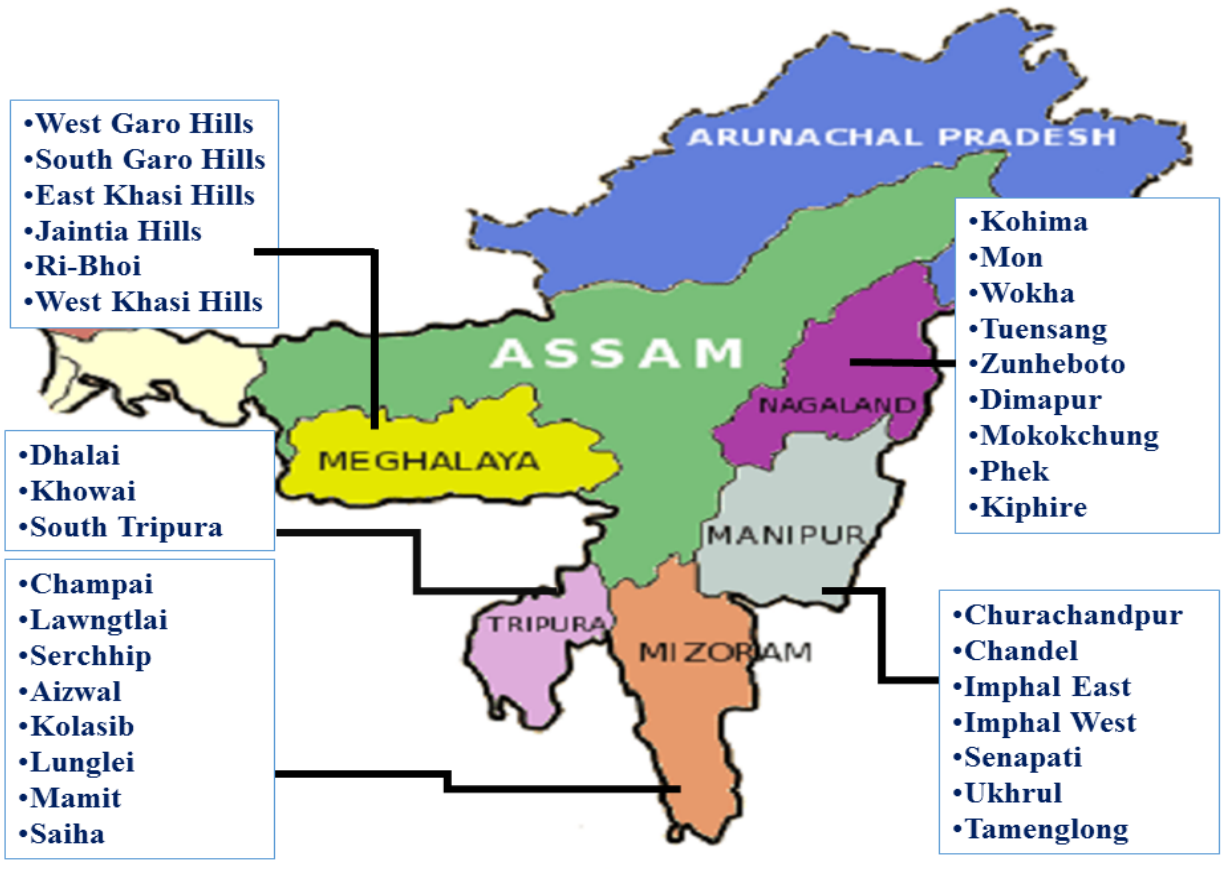


Figure 1.3. KVKs Under NEMA Project

BRIEF ACCOUNT OF KVK GENESIS, MANDATE AND GROWTH

KVK Genesis

The Education Commission (1964-66) recommended that a concerted effort be made to establish specialized institutions to provide pre- and post-matriculate vocational education in agriculture and allied fields to meet the training needs of many youths in rural areas. The Commission further suggested that such institutions be named Agricultural Polytechnics. The Commission's recommendations were thoroughly discussed by the Ministry of Education, Ministry of Agriculture, Planning Commission, ICAR, and other associated institutions between 1966 and 1972. Finally, ICAR mooted the idea of establishing KVKs as innovative institutions for imparting vocational training to practicing farmers, school dropouts, and field-level extension functionaries. ICAR Standing Committee on Agricultural Education in its meeting held in August, 1973 observed that the establishment of KVKs was of national importance because it would help accelerate agricultural production and improve the socio-economic conditions of the farming community and that all related institutions should be involved in implementing this scheme. As a result, in 1973, the ICAR formed a committee chaired by Dr. Mohan Singh Mehta of Seva Mandir in Udaipur (Rajasthan) to devise a thorough plan for implementing this scheme. The Committee submitted its report in 1974.

The first KVK, on a pilot basis, was established in 1974 at Puducherry (Pondicherry) under the administrative control of the Tamil Nadu Agricultural University (TNAU), Coimbatore. In 1976-77, the Planning Commission approved the proposal of the ICAR to establish 18 KVKs during the Fifth Five- Year Plan. With the growing demand for more KVKs, the Governing Body (GB) of the ICAR approved 12 more KVKs in 1979 and they were established in the same year by the Agricultural Produce Cess Fund (AP Cess Fund). Pending the clearance of the Sixth Five-Year Plan scheme on KVK by the Planning Commission, the GB of the ICAR again approved 14 KVKs in 1981, established during 1982-83 from AP Cess Fund.

A High-Level Evaluation Committee on KVK constituted by the ICAR in 1984, after a thorough review of the programme, strongly recommended establishing more KVKs in the country. Keeping this in view the Planning Commission approved to establish 44 new KVKs during the Sixth Plan. Thus, by the end of the Sixth Plan, 89 KVKs had started functioning in the country. During the Seventh Plan, 20 new KVKs were established. The success of KVKs at many locations created a great demand for the establishment of more KVKs in the remaining districts of the country. Accordingly, the Planning Commission further approved 74 new KVKs to be established during the period 1992-93. Again, in the Eighth Plan (1992-97), 78 new KVKs were approved and established in the country, making the total number of functional KVKs 261 by the end of the Eighth Plan. The number of KVKs increased to 290 during the Ninth Plan with the establishment of 29 more KVKs.

On the occasion of the Independence Day Speech on 15th August, 2005 the Hon'ble Prime Minister of India announced that by the end of 2007 there should be one KVK in each of the rural districts of the country. This has taken the total number of KVKs to 551 at the end of the Tenth Plan. At present, there are 722 KVKs established in the Country. This is an excellent network for exchanging technology and empowering farmers to enhance productivity and profitability.

All KVKs are working towards minimizing the time lag between the generation of technology at the research institution and its adoption in location-specific farmer fields for increasing production, productivity, and net farm income on a sustained basis.

KVK Mandates

The mandate of KVK is *Technology Assessment and Demonstration for its wider Application and to enhance Capacity Development (TADA-CD).* To implement the mandate effectively through the creation of awareness about improved agricultural technologies; the following activities have been defined for each KVK.

i. On-farm testing assesses the location specificity of agricultural technologies under various farming systems.

ii. Outscaling of farm innovations through frontline demonstration to showcase the specific benefits/ worth of technologies on farmers' fields.

iii. Capacity development of farmers and extension personnel to update their knowledge and skills in modern agricultural technologies and enterprises.

iv. Work as a Knowledge and Resource Centre for improving the overall agricultural economy in the operational area.

v. Conduct frontline extension programs and provide farm advisories using ICT and other media on varied subjects of interest to farmers

vi. Data documentation, characterization, and strategic planning of farming practices.

KVK should produce technology-related quality inputs/products (seeds, planting materials, bio-agents, livestock, fingerlings etc.) and make them available to farmers while operating as a single-window Agricultural Technology Information Centre (ATIC). Besides, identifying and documenting selected farmer-led innovations and converging them with ongoing schemes and programmes within the mandate of KVK.

Growth of KVKs under ICAR-ATARI, Zone VII, Umiam

The first KVK in the region was established in Kolasib district of Mizoram in February 1979 during the Rolling year (1978-1980) to impart training to furnish the farmers with skills and knowledge required for practicing advanced agricultural and allied practices. Gradually with the increase in number, the sphere of KVKs also widened to shoulder other responsibilities like conducting front-line demonstrations, on-farm trials, providing training to other stakeholders *etc.* During the IXth plan, the zone had only 13 KVKs with most of them under ICAR administration. Presently in Zone-VII, Umiam, KVKs are functioning under 12 different host organisations namely; ICAR Research Complex for NEH Region, Umiam (14), Central Agricultural University, Imphal (5), Department of Agriculture, Govt. of Manipur (1), Department of Agriculture, Govt. of Meghalaya (3), Department of Agriculture, Govt. of Nagaland (4), Department of Agriculture (Research & Education), Govt. of Mizoram (7), Dept. of Agriculture and Farmers Welfare, Govt. of Tripura (4), NRC on Mithun, Jharnapani, Nagaland (1), Nagaland University, Kohima (1), Utlou Joint Farming Cum Pisciculture Co-operative Society (UJFPCS), Bishnupur, Manipur (1), Foundation for Environment & Economic Development Services (FEEDS), Senapati, Manipur (1) and Sri Ramakrishna Seva Kendra, Kolkata, West Bengal (1). The state and host organization-wise KVKs under ICAR-ATARI, Umiam are depicted in Fig 1.4.

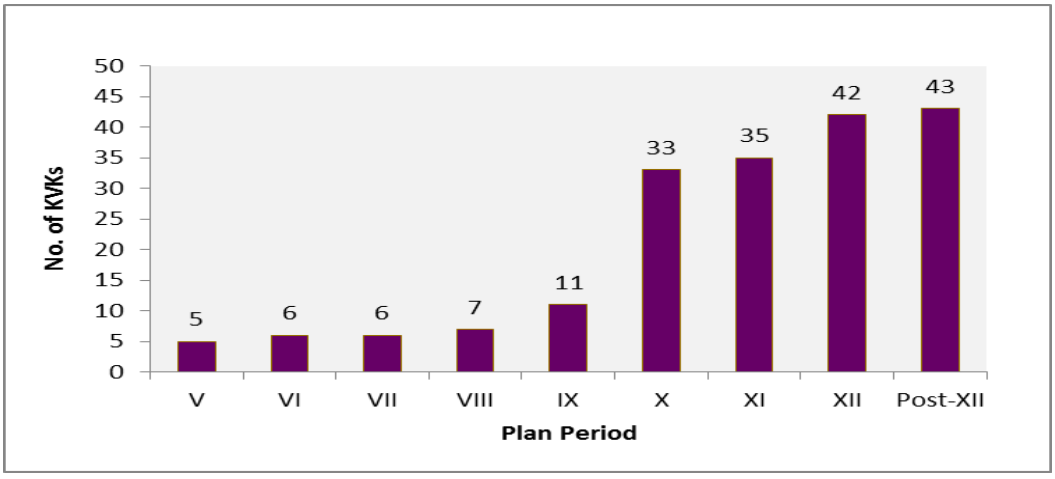


Fig 1.4. Growth of KVKs over five year plans under ATARI, Zone VII, Umiam

MANPOWER AND INFRASTRUCTURAL FACILITIES IN KVKS

Status of Manpower in KVKs of ICAR-ATARI

The KVKs under ICAR-ATARI, Zone VII, Umiam presently have 536 (78%) staff are in position out of 688 sanctioned strengths in different positions including Sr. Scientist & Head, Subject Matter Specialist, Programme Assistant, Assistant, Stenographer, Driver, and Supporting Staff. The remaining vacancies of different cadres are in the process of recruitment by the concerned host institutes. The state and KVK-wise present staff position of KVKs under this institute is given in Table 1.3.

Table 1.3: Present status of state-wise and category-wise staff strength of KVKs

Sl. No.	Category	Manipur (9 KVKs)		Meghalaya (7 KVKs)		Mizoram (8 KVKs)		Nagaland (11 KVKs)		Tripura (8 KVKs)		Total (43 KVKs)	
		S	F	S	F	S	F	S	F	S	F	S	F
1	Senior Scientist &Head	9	8	7	7	8	8	11	11	8	4	43	38
2	Subject Matter Specialist	54	49	42	38	48	44	66	43	48	40	258	214
3	Programme Assistant	18	12	14	13	16	16	22	15	16	9	86	65
4	Farm Manager	9	7	7	6	8	7	11	7	8	6	43	33
5	Assistant	9	3	7	3	8	7	11	4	8	4	43	21
6	Stenographer	9	8	7	5	8	8	11	9	8	2	43	32
7	Driver	18	15	14	12	16	15	22	14	16	6	86	62
8	Skilled Supporting Staff	18	16	14	14	16	16	22	16	16	9	86	71
Total		**144**	**118**	**112**	**98**	**128**	**121**	**176**	**119**	**128**	**80**	**688**	**536**
Filled posts (%)		**82**		**88**		**95**		**68**		**63**		**78**	

Note: S- Sanctioned and F- Filled

Status of infrastructural facilities in KVKs of ATARI, Umiam

During the reporting period, KVKs in Zone VII have made notable strides in infrastructure development. Out of the 43 KVKs, 40 KVKs have an administrative building, enhancing their operational efficiency. Additionally, 16 KVKs offer farmers' hostels, providing accommodation for those attending training programs. Residential facilities for staff are available at 22 KVKs, ensuring their well-being and continuity of work. The region has also established 229 demonstration units across 39 KVKs, with 19 KVKs hosting soil and water testing. E-connectivity is present in 10 KVKs, and 72 rainwater harvesting structures have been implemented. Specialized infrastructure includes 7 portable carp hatchery units, 38 integrated farming system (IFS) models, and 110 minimal processing facilities. Additionally, 22 solar panels, 3 technology information units, and 5 micro-nutrient analysis units further enhance the capabilities of the KVKs.

Table 1.4: Present State wise details of infrastructure in KVKs of ATARI, Umiam

Sl. No.	Type of infrastructure	Infrastructure (No.)					
		Manipur	Meghalaya	Mizoram	Nagaland	Tripura	Total
1.	Administrative building	8	7	8	9	8	40
2.	Farmers hostel	3	2	8	2	1	16
3.	Staff quarter	5	1	7	7	2	22
4.	Demonstration unit	45	30	40	49	65	229
5.	Soil and water testing lab	5	3	7	2	2	19
6.	E-connectivity	3	1	4	0	2	10
7.	Rainwater harvesting structure	19	4	20	18	11	72
8.	Portable carp hatchery	4	1	1	0	1	7
9.	Integrated Farming System (IFS) unit	7	5	8	12	6	38
10.	Minimal processing units	4	2	0	2	2	10
11.	Solar panels	17	1	3	0	1	22
12.	Technology information units	1	0	0	2	0	3
13.	Micro-nutrient analysis units	2	0	0	0	3	5

Revolving Fund

At the beginning of the fiscal year on April 1st, 2023, the KVKs held an opening balance of ₹14,231,456.57. Throughout 2023, they accrued an income of ₹6,127,318.68, leading to a closing balance of ₹18,061,464.71 by March 31st, 2024. These revolving funds were effectively utilized to enhance revenue and resources from the KVKs' farmlands. The KVKs have been instrumental in producing high-quality seeds and planting materials for a variety of crops and enterprises, such as rice, oilseeds, pulses, fruits, vegetables, spices, ornamental crops, plantation crops, bio-fertilizers, bio-agents, bio-pesticides, piglets, fingerlings, and chicks. These products are supplied to farmers and relevant line departments for distribution during the reporting period. For detailed state-wise information on the opening balance and status of revolving funds, please refer to Table 1.5.

2 Technology assessment through On Farm Trials (OFTs)

To assess the production potential of crops, livestock, fishery, and other enterprises, the KVKs under this Zone accomplished all the mandated activities, including technology assessment, refinement, front-line demonstrations for crops, training for farmers, farm women, rural youth, and extension personnel, as well as the production of seeds and planting materials and the conduct of various extension programs. The specific achievements in various categories during 2023 are presented below.

In 2023, the KVKs of ATARI, Umiam assessed and refined several agricultural technologies on farmers' fields to analyze the site-specificity of these technologies under various farming systems. In the area of crop-based technologies, a total of 342 technologies were assessed across five states, with Nagaland having the highest number of technologies assessed (98) and a total of 582 trials conducted. Additionally, four crop-based technologies were refined, with 70 trials conducted by the KVKs. In the realm of livestock technologies, 96 technologies were assessed, involving 652 trials, with Nagaland having the highest number of technologies assessed (27). Furthermore, one livestock technology was refined, with 70 trials conducted by the KVKs in Mizoram. These assessments and refinements represent ongoing efforts to enhance agricultural practices and benefit farming communities in these regions, focusing on both crop-based and livestock technologies (Table 2.1).

Assessment of finger millet

Table 2.1: State-wise summary of Agriculture Technologies Assessed and Refined by KVKs during 2023

Sl No	Area	States					
	Agricultural Technologies Assessed During 2023						
1	**Crops Based Technologies**	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Tripura**	**Total**
	i) No of Technologies	65	56	67	98	56	**342**
	ii) No of Trials	488	257	216	582	355	**1898**
	iii) No of Beneficiaries	530	498	294	645	636	**2603**
2	**Livestock Technologies**						
	i) No of Technologies	12	26	11	27	20	**96**
	ii) No of Trials	56	224	43	219	110	**652**
	iii) No of Beneficiaries	70	234	45	215	117	**681**

Agricultural Technologies Refined during 2023							
1	**Crops Based Technologies**	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Tripura**	**Total**
	i) No of Technologies			7			**7**
	ii) No of Trials			70			**70**
	iii) No of Beneficiaries			70			**70**
2	**Livestock Technologies**						**0**
	i) No of Technologies		3				**3**
	ii) No of Trials		14				**14**
	iii) No of Beneficiaries		35				**35**

Crop-based technologies assessed during 2023

During the year 2023, about 342 technologies were taken up on different areas of crop enterprises under 31 thematic areas by the KVKs of the Zone for their assessment to identify location-specific technologies under local farming situations with 1898 trials in 1034 different locations.

About 111 technologies were assessed under varietal evaluation thematic area with 490 trials conducted in 345 different locations, 59 technologies were assessed under INM with 241 trials, 12 technologies in integrated crop management with 35 trials, 31 technologies in IPM with 143 trials, 20 technologies in integrated disease management with 68 trails, four technologies assessed under weed management, 24 technologies were assessed under thematic area value addition with 95 trails in 57 different locations, etc. (Table 2.2).

In 2023, the KVKs undertook extensive activities in various thematic areas to advance agricultural practices and benefit farmers. A total of 342 technologies were assessed, encompassing a diverse range of areas including Integrated Nutrient Management, which saw the assessment of 59 technologies with 241 trials across 156 locations, benefiting 254 farmers. Varietal Evaluation was the most extensively covered area, with 111 technologies assessed, 490 trials conducted, and 541 farmers benefiting. Other significant areas included Integrated Pest Management, with 31 technologies and 143 trials, and Integrated Crop Management, with 12 technologies and 35 trials. The assessments also spanned Small Scale Income Generation Enterprises, Weed Management, and Resource Conservation Technology, among others, with a focus on practical benefits such as drudgery reduction and post-harvest technology. Each thematic area aimed to address specific agricultural challenges, with a total of 1,898 trials conducted across 1,032 locations, ultimately benefiting 2,603 farmers. The diverse range of technologies assessed reflects a comprehensive approach to improving agricultural productivity and sustainability in the region.

Table 2.2: Summary of Crop-based technologies assessed under different thematic areas during 2023

Sl. No.	Thematic areas	Number of Technology Assessed	No. of trials	No. of Locations	Farmer Beneficiary (No.)
1	Integrated Nutrient Management	59	241	156	254
2	Varietal Evaluation	111	490	345	541
3	Integrated Pest Management	31	143	84	164
4	Integrated Crop Management	12	35	30	40

5	Integrated Disease Management	20	68	57	82
6	Small Scale Income Generation Enterprises	2	10	4	30
7	Weed Management	4	14	13	14
8	Resource Conservation Technology	7	57	22	61
9	Farm Machineries	5	14	13	14
10	Integrated Farming System	1	3	3	4
11	Seed / Plant production	10	34	33	64
12	Post-Harvest Technology	1	3	3	6
13	Drudgery Reduction	4	113	15	113
14	Storage Technique	2	10	10	10
15	Cropping Systems	2	7	4	7
16	Water management	8	28	19	30
17	Biological control	1	5	3	10
18	Mushroom cultivation	2	21	10	21
19	Canopy Management	1	2	2	6
20	Protected Cultivation	6	30	23	43
21	Value addition	24	95	57	177
22	Information and Communication Technology	1	2	3	50
23	Impact Assessment	8	272	60	427
24	Bio stimulant	1	2	1	2
25	Bench mark survey	1	3	1	3
26	Organic cultivation	2	11	8	11
27	High Density Planting	1	7	4	7
28	Technology backstopping	1	3	1	3
29	PRA	1	3	2	50
30	Impact analysis	1	60	0	60
31	Others	12	112	46	299
Total		**342**	**1898**	**1032**	**2603**

OFT on Garlic

OFT on performance assessment of rice var. RC Maniphou 15

Livestock-based technologies assessed during 2023

During the reporting period, a total of 96 technologies with 652 trials under thirteen different thematic areas related to livestock enterprises such as cattle, piggery, fishery, poultry, duckery, goatery, rabbitry, and so on were assessed in 298 different locations of this institute. 30 technologies in breed evaluation with 312 trails, 18 technologies in fish production with 106 trails, 12 technologies in production and management with 62 trails, 11 technologies in feed and fodder management with 52 trails, 12 technologies in nutrition management with 47 trails, three technology in an integrated farming system with 9 trails, one technology in disease management with 10 trails, small scale income generating enterprises with 4, etc. are the major thematic areas under livestock technologies were assessed in 2023 (Table 2.3).

Table 2.3: Summary of livestock-based technologies assessed under different thematic areas during 2022

Sl. No	Thematic areas	Number of Technology Assessed	No. of trials	No. of Locations	Farmer Beneficiary (No.)
1	Disease Management	1	10	2	10
2	Evaluation of Breeds	30	312	94	322
3	Feed and Fodder management	11	52	32	52
4	Nutrition Management	12	47	36	45
5	Production and Management	12	62	29	63
6	Small Scale Income Generation Enterprises	1	4	4	4
7	Fish Production	18	106	62	123
8	IFS	3	9	8	9
9	Fish seed production	1	3	3	3
10	Others	7	47	28	50
Total		**96**	**652**	**298**	**681**

OFT on Rainbow Rooster

OFT on Assessment of White Pekin Duck

Technology Refinement

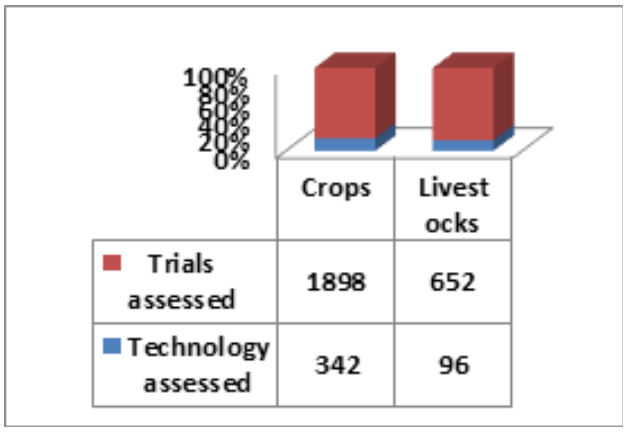
During 2023, seven crop-based technologies related to cereals, oilseeds, vegetables, and fruit crops were taken up for refinement under five different thematic areas with 70 trials at 63 various locations under Zone VII. The major thematic areas were value addition with five no. of trials, post-harvest loss/ technology with five trials, INM with 25 trials, and Varietal evaluation with 25 trials. In the livestock sector, one technology was refined with four trials under thematic area value addition, and two technologies with 10 trials were refined in 2023 (Tables 2.4 & 2.5).

Table 2.4: Summary of crop-based technologies refined under different thematic areas during 2023

Sl. No.	Thematic area	No. of technology refined	No. of trials	No. of Locations	Farmer Beneficiary (No.)
1	Varietal Evaluation	2	25	25	25
2	Integrated Nutrient Management/ Soil health management	2	25	25	25
3	Nutrient Enriched Compost	1	10	10	10
4	Value addition	1	5	1	5
5	Post-harvest loss/ technology	1	5	2	5
Total		**7**	**70**	**63**	**70**

Table 2.5: Summary of Livestock Technologies Refined under different thematic areas during 2023

Sl.	Thematic areas	No. of Technology Refined	No. of trials	No. of Locations	Farmer Beneficiary (No.)
1	Value addition	1	4	1	20
2	Disease Management	2	10	2	15
	Total	**3**	**14**	**3**	**35**



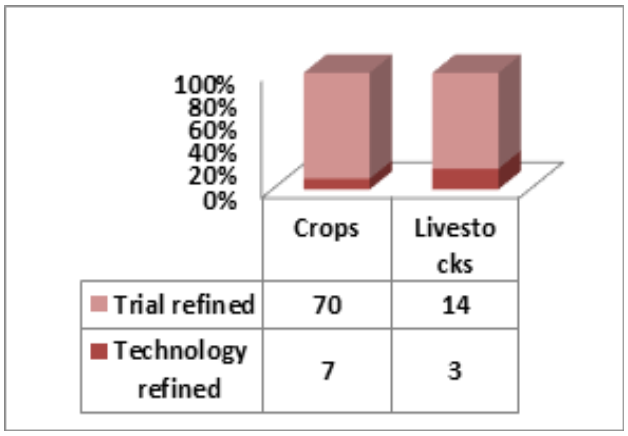


Fig 2.1: Trials conducted for assessment and refinement of agricultural technologies by KVKs during 2023

3 Front line Demonstrations (FLDs)

FLD on Cereals and Millets

Frontline demonstrations (FLDs) were conducted to demonstrate the production potential of newly released crop varieties/production technologies in crops/ animal husbandry/ other agriculture-related enterprises on the farmers' fields. These demonstrations were also utilized for organizing training and field days for the benefit of extension workers and farmers.

Cereals: A total of 568 demonstrations were conducted, covering an area of 243.92 hectares. This included 374 demonstrations on paddy and 194 demonstrations on maize. For paddy, resource conservation technologies and improved varieties such as Gomati, Tripura Nirog, Hari-narayan, Sali Rice, CAU R-1, Shahsarang, Gitesh, Swarna Musori, RC Maniphou-7, RC Maniphou-10, RC Maniphou-12, RC Maniphou-13, Pusa Sugandh-5, LQMH-1, VLQPM-45, and RCM 13 were utilized. These technologies and varieties resulted in an overall increase in grain yield by 26.59% compared to the check varieties, with a benefit-cost ratio (BCR) of 1.96. In maize, the varieties RCM-76, Syngenta Sugar 75, HQPM-5, HQPM-1, IPM, RCM 1-76, RCM-1-75, Ruby Corn, and Sticky Corn, along with local varieties, recorded an average grain yield of 31.39 quintals per hectare. This was an improvement over the check varieties, which yielded 23.99 quintals per hectare.

Millets: Demonstrations were also conducted on finger millet, foxtail millet, and sorghum, with 76 demonstrations covering an area of 23 hectares during 2023-24. Improved varieties of these millets showed a significant improvement in yield compared to local varieties. For finger millet, varieties such as CFMV-1, VL-376, and VL Mandua 352 led to an overall yield increase of 43.15% compared to the local check. In foxtail millet, high-yielding varieties like SIA 3156 and SIA 3085 resulted in a 40.08% increase in yield over the check. Similarly, in sorghum, the variety CSV 27 contributed to a 34.45% increase in demonstration yield.

Table 3.1: Frontline demonstrations conducted on cereals and millets by KVKs of Umiam during 2023

Crop	Variety	No. of Farmers/ Demo.	Area (ha)	Average yield (q/ha)		Avg.% Increase in yield	Economics of the FLD					
							Avg.cost of cultivation (Rs/ha)		Avg. Gross return		Benefit-Cost ratio	
				Demo	Check		Demo	Check	Demo	Check	Demo	Check
CEREALS												
Rice (Paddy)	Gomati, Tripura Nirog, Hari-narayan, Sali Rice, CAU R-1, Shahsarang, Gitesh, Swarna Musori, RC Maniphou-7, 10, 12, 13, Pusa Sugandh-5, LQMH-1, VLQPM-45, RCM 13	374	180.42	33.05	26.11	26.59	44927	42505	88242	67444	1.65	1.59
Maize	RCM-76, Syngenta -Sugar 75, HQPM-5, HQPM-1 (IPM, RCM 1-76, RCM-1-75 Ruby Corn, Sticky Corn and Local	194	63.5	31.39	23.99	30.88	46619	48299	140047	106269	3.00	2.20
Sub Total		568	243.92									
MILLETS												
Finger Millet	CFMV-1, VL-376, VL Mandua 352	30	8.5	15.18	10.61	43.15	32333	28167	75917	46893	2.35	1.66
Sorghum (Jowar)	CSV 27	4	1	15.76	10.33	34.45	33900	27320	110320	51650	3.25	1.89
Foxtail	SIA 3156, SIA 3085 and Local	42	13.5	22.02	15.72	40.08	28667	27100	66450	54292	2.32	2.00
Sub total		**76**	**23**									
Total		**644**	**266.92**									

Oilseeds

During the year, 726 demonstrations in a 306.64 ha area were conducted on groundnut, mustard, sesamum, soybean and toria (Table 3.2.). Among the oilseed crops, the highest number of demonstrations (337) was conducted for toria, covering an area of 178 hectares, followed by mustard (255 demonstrations) covering an area of 87.89 hectares. The highest percentage increase in yield was observed in toria (49.28%), followed by sesame (43.00%), groundnut (32.13%), soybean (29.03%), and mustard (29.80%). Demonstrations on different varieties of soybean (Umiam Soya, JS 335, JS 97-52, Dsb-19, VL Soya 63, JS-95-60) produced an average yield of 17.79 q/ha, which is a 29.03% increase compared to the local check yields of 13.79 q/ha. Similarly, groundnut cultivars such as Dharani, Girnar 1, and ICGS 76 produced an average yield of 18.34 q/ha compared to the local check of 13.88 q/ha, resulting in a 32.13% increase in yield. Mustard cultivars such as NRCHB 101, TS-38, and Pusa Mustard-26, 27, and 28 produced an average yield of 71.11 q/ha in demonstrations, compared to only 54.79 q/ha for the local check, representing a yield increase of 29.80%. Toria varieties such as TS-38 and TS-67 yielded 8.67 q/ha on average, compared to a local check of 5.81 q/ha, an increase of 49.28%. The sesame cultivar Tripura Siphing yielded 8.6 q/ha as compared to the local yield of 6 q/ha, with a yield increase of 43.00%.

Table 3.2: Frontline demonstrations conducted on oilseeds by KVKs of Umiam during 2023

Crop	Variety	No. of Farmers/ Demo.	Area (ha)	Average yield (q/ha)		Avg.% Increase in yield	Economics of the FLD					
							Avg.cost of cultivation (Rs/ha)		Avg. Gross return		Avg. Benefit-Cost ration	
				Demo	Check		Demo	Check	Demo	Check	Demo	Check
OILSEEDS												
Soybean	Umiam Soya, JS 335, JS 97-52, Dsb-19, VL Soya 63, JS 97-52, JS-95-60	74	21.75	17.79	13.79	29.03	32439	26633	69160	52460	2.13	1.86
Groundnut	Dharani, Girnar 1, ICGS 76	45	16	18.34	13.88	32.13	44783	33517	176389	79364	3.94	2.37
Mustard	NRCHB 101, TS-38, Pusa Mustard-26, 27 & 28	255	87.89	71.11	54.79	29.80	27353	23563	66433	54130	2.43	2.30
Toria	TS-38, TS-67	337	178	8.67	5.81	49.28	23402	20064	61200	41075	3.05	2.05
Sesamum	Tripura Siphing	15	3	8.6	6	43.00	17180	16750	34400	31160	2	1.86
Total		**726**	**306.64**									

Pulses : Frontier technologies on pulse crops such as black gram, lentil, French bean, field pea, garden pea, and green gram were demonstrated in 419 demonstrations covering an area of 122.95 hectares (Table 3.3). Demonstrations on different varieties of black gram (PU-31, Tripura Maskolai-1, IPU 02-43) produced an average yield of 9.50 q/ha, which is a 45.28% increase over the local check yields of 6.54 q/ha. Similarly, field pea cultivars such as Aman, Prakash, TRCP-9, IPFD 10-12, Pusa Pragati, Arkel, Vikas, and Rachna produced yields of 24.64 q/ha, compared to the local check of 16.37 q/ha, representing a 50.46% increase in yield. French bean cultivars such as Anupama, Arka Sharath, and HUR-301 produced 40.73 q/ha, compared to the local check of 28.50 q/ha, resulting in a 42.89% increase in yield. Lentil cultivars such as IPL-220 and HUL-57 produced 9.43 q/ha, compared to the local check of 7.14 q/ha, which is a 32.10% increase in yield. The green gram variety SGC-16 produced 10.02 q/ha, compared to the local check of 8.72 q/ha, with a 15.00% increase in yield. Garden pea varieties such as Arka Apoorva, Azad P-4, and Azad P-5 yielded an average of 24.03 q/ha, against a local check of 16.21 q/ha, marking an increase of 48.29%.

Table 3.3: Frontline demonstrations conducted on Pulses by KVKs of Umiam during 2023

Crop	Variety	No. of Farmers/ Demo.	Area (ha)	Average yield (q/ha)		Avg.% Increase in yield	Economics of the FLD					
							Avg.cost of cultivation (Rs/ha)		Avg. Gross return		Avg. Benefit-Cost ration	
				Demo	Check		Demo	Check	Demo	Check	Demo	Check
PULSES												
Blackgram	PU-31, Tripura Maskolai-1, IPU 02-43	103	33.2	9.50	6.54	45.28	29478	25900	72333	48133	2.45	1.86
Field pea	Aman, Prakash, TRCP-9, IPFD 10-12, Pusa Pragati, Arkel, Vikas, Rachna	245	69.5	24.64	16.37	50.46	37584	27902	90247	58205	2.40	2.09
Frenchbean	Anupama, Arka Sharath, HUR-301	13	2.5	40.73	28.50	42.89	42050	38125	107100	81000	2.55	2.12
Lentil	IPL- 220, HUL-57	27	8.75	9.43	7.14	32.10	37320	35370	103110	79370	2.76	2.24
Greengram	SGC-16	10	2	10.02	8.72	15.00	25014.00	24150	85751	74626	3.43	3.09
Garden Pea	Arka Apoorva, Azad P-4, Azad P-5	21	7	24.03	16.21	48.29	29000	27650	70025	56522	2.41	2.04
Total		**451**	**166.5**									

Horticultural crops: Altogether, 990 demonstrations on horticultural crops comprising vegetables (561), fruits (100), spices and condiments (160), and tuber crops (169) were conducted in 227.01 ha area by the KVKs of ICAR-ATARI Zone VII.

Vegetables: During the year 2023, a total of 561 demonstrations were conducted on different vegetable crops, including cabbage, broccoli, brinjal, tomato, bitter gourd, okra, cauliflower, French bean, green chilli, carrot, green pea, broad bean, and pumpkin, covering an area of 130.29 hectares (Table 3.4). Demonstrations on different varieties of cabbage (Green Hero, Rare Ball, Pride of India, Fire Ball, Pusa Mukta) produced an average yield of 196.82 q/ha, a 22.59% increase over the local check yield of 160.54 q/ha. Similarly, broccoli cultivars such as Green Magic and CLX 3512 produced 176.14 q/ha, compared to the local check of 122.22 q/ha, with a 33.84% increase in yield. Brinjal cultivars (Pusa Purple Round, Arka Keshav, Arka Harshita, Brinjal TRC-Singnath) produced an average yield of 244.28 q/ha in demonstrations, compared to 197.95 q/ha for the local check, an increase of 23.40%. Tomato varieties such as Arka Samrat, Arka Abhed, and Arka Rakshak yielded 244.28 q/ha on average, against a local check of 197.95 q/ha, resulting in a 23.40% increase. The bitter gourd cultivar (Local) yielded 97 q/ha, compared to the local yield of 54 q/ha, with an increase of 80%. Okra varieties such as Arka Anamika and Arka Nikita yielded 148.42 q/ha on average, compared to a local check of 114 q/ha, an increase of 30.19%. Cauliflower varieties such as Valentina yielded 152 q/ha on average, compared to a local check of 146 q/ha, an increase of 4.10%.

French bean varieties such as Zorin, Arka Anoop, Arka Arjun, and Anupam yielded 110.44 q/ha on average, against a local check of 81.78 q/ha, an increase of 35.04%. Green chilli varieties such as Arka Meghana and Arka Harita yielded 68.52 q/ha on average, compared to a local check of 53.60 q/ha, an increase of 27.81%. Carrot varieties such as Pusa Rudhira yielded 126 q/ha on average, against a local check of 58 q/ha, an increase of 117.24%. Green pea varieties such as V Arkel, Pusa Pragati, Azad P-5, and Arka Apoorva yielded 65.34 q/ha on average, compared to a local check of 48.90 q/ha, an increase of 33.61%.

The broad bean variety Pusa Udit yielded 49.44 q/ha on average, compared to a local check of 33.92 q/ha, an increase of 45.75%. The pumpkin variety Bhima yielded 110 q/ha on average, against a local check of 80 q/ha, an increase of 37.50%. Other local vegetable varieties yielded 251.12 q/ha on average, compared to a local check of 167.17 q/ha, increasing by 50.21%.

Table 3.4: Frontline demonstrations conducted on Vegetables by KVKs of Umiam during 2023

Crop	Variety	No. of Farmers/ Demo.	Area (ha)	Average yield (q/ha)		Avg.% Increase in yield	Economics of the FLD					
							Avg.cost of cultivation (Rs/ha)		Avg. Gross return		Avg. Benefit-Cost ration	
				Demo	Check		Demo	Check	Demo	Check	Demo	Check
VEGETABLES												
Cabbage	Green Hero, Rare ball, Pride of India, Fire ball, Pusa Mukta	65	15	196.82	160.54	22.59	147982.13	57075.63	188000	63800	1.2	1.1
Broccoli	Green magic, CLX 3512	51	7.53	176.14	122.22	33.84	271413	184375	566001	403000	2.95	1.92
Brinjal	Pusa purple round, Arka Keshav, Arka Harshita, Brinjal TRC-Singnath	47	12.81	183.79	141	44.11	80382.90	52220.31	258554.38	155317.5	3.21	2.97
Tomato	Arka Samrat, Arka Abhed, Arka Rakshak, Local	128	32.6	244.28	197.95	23.40	114551.66	113706.13	468506.68	427804.17	4.08	3.76
Bitter Gourd	Local	25	5.1	97	54	80	105000	142000	200000	388000	2.81	2.78
Okra/Bhindi	Arka Anamika, Arka Nikita, Local	36	9	148.42	114	30.19	87895	66758	100000	77685	1.38	1.16
Cauliflower	Valentina	10	2	152	146	4.10	345450	319900	912000	657000	2.64	2.05
French bean	Zorin, Arka Anoop, Arka Arjun, Anupam	24	4	110.44	81.78	35.04	62075	57475	188325	140250	3.03	2.67
Chilli (Green)	Arka Meghan, Arka Harita, Local	45	12.75	68.52	53.60	43.18	51463.4	48359	124910	97238	2.42	2.01
Carrot	Pusa Rudhira	10	1	126	58	117.24	55273	49600	248850	114550	4.5	2.3
Green pea	Arkel, Pusa Pragati, Azad P-5, Arka Apoorva	48	15	65.34	48.90	33.61	53392.5	50256.66	125033.33	104966.67	2.34	2.08
Broad bean	Pusa Udit, Local	27	5	49.44	33.92	45.75	49900	460887.5	55980	499870	1.12	1.08
Pumpkin	Bhima	10	1	110	80	38.00	65000	72000	165500	220000	2.54	3
Other	Local	35	7.5	251.12	167.17	50.21	38947.5	33485	46580	36750	1.19	1.09
Total		**561**	**130.29**									

Fruits: During the reporting period, A total of 100 demonstrations were conducted in different fruit crops, including mandarin, mango, watermelon, peach, dragon fruit, banana, and kiwi, covering an area of 34.93 hectares (Table 3.5). The demonstrations on different varieties of mandarin (Khasi Mandarin and Tamenglong Orange) produced an average yield of 73.90 q/ha, which represents a 120.75 percent increase over the local check yield of 33.48 q/ha. Similarly, the mango cultivar Amrapali produced a yield of 41.25 q/ha, compared to the local check yield of 29.25 q/ha, resulting in a 41.00 percent increase in yield. For watermelon, cultivars such as Arka Madhura and Sugar Queen produced an average yield of 238.73 q/ha in the demonstrations, compared to 204.57 q/ha for the local check, an increase of 16.70 percent. Peach varieties (Alton, Flordasun, and Partap) yielded 103.75 q/ha on average, compared to the local check yield of 49.00 q/ha, resulting in a 112 percent increase. The dragon fruit cultivar (Red flesh) yielded 166.46 q/ha, compared to the local check yield of 116.87 q/ha, an increase of 42 percent.

Banana varieties such as Tall Cavendish yielded an average of 275.20 q/ha, compared to the local check yield of 227.80 q/ha, resulting in a 21 percent increase. Lastly, kiwi varieties such as Abbott, Allison, Bruno, Hayward, Monty, and Tomuri yielded an average of 102.58 q/ha, compared to the local check yield of 64.08 q/ha, an increase of 60.08 percent.

Table 3.5: Frontline demonstrations conducted on fruits by KVKs of Umiam during 2023

Crop	Variety	No. of Farmers/ Demo.	Area (ha)	Average yield (q/ha)		Avg.% Increase in yield	Economics of the FLD					
							Avg.cost of cultivation (Rs/ha)		Avg. Gross return		Avg. Benefit-Cost ration	
				Demo	Check		Demo	Check	Demo	Check	Demo	Check
FRUITS												
Mandarin	Khasi Mandarin & Tamenglong Orange	17	5	73.90	33.48	120.75	136062	73948	505100	216895	3.71	2.93
Mango	Amrapali	3	0.48	41.25	29.25	41	81831	95812	13100	112200	2.72	2.12
Water melon	Arka Madhura, Sugar Queen and Local	38	14	238.73	204.57	16.70	213114	192065	726000	452900	3.41	2.36
Peach	Alton, Flordasun & Partap	9	3.00	103.75	49.00	112.00	117568	83266	373602	159250	3.18	1.91
Dragon Fruit	Red Flesh	10	2	166.46	116.87	42.00	483849	393501	1664600	1168700	3.44	2.97
Banana	Tall Cavendish	10	5	275.20	227.80	21.00	166600	160000	420400	331840	2.52	2.07
Kiwi	Abbott, Allison, Bruno, Hayward, Monty, & Tomuri	13	5.45	102.58	64.08	60.08	275813	268000	976097	568607	3.54	2.12
Total		**100**	**34.93**									

Spices and Condiments: A total of 160 demonstrations were conducted in a 38.92 ha area on turmeric, ginger, chilli, garlic, and onion (Table 3.6). Demonstration on different varieties of turmeric (Lakadong, Megha Turmeric-1 & Rajendrasonia) produced an average yield of 123.55 q/ha, a 24.57 percent increase above the local check yields of 99.18 q/ha. Similarly, ginger cultivars such as Nadia yielded 172.94 q/ha compared to the local check 117.43 q/ha with a 47.27 per cent increase in yield over the local check. Chilli cultivars such as (King chilli) produced an average yield of 88.67 q/ha in a demonstration, compared to only 65.29 q/ha for the local check, a yield increase of 35.81 percent. Garlic cultivars such as (G-313) produced an average yield of 136.00 q/ha in demonstration, compared to only 118.50 q/ha for the local check, a yield increase of 15 percent. Onion cultivars such as (Arka Kalyan, Arka Kirthiman & Bhima Shakti) produced an average yield of 155.78 q/ha in the demonstration, compared to only 109.07 q/ha for the local check, a yield increase of 42.82 percent.

Table 3.6: Frontline demonstrations conducted on Spices and Condiments by KVKs of Umiam during 2023

Crop	Variety	No. of Farmers/ Demo.	Area (ha)	Average yield (q/ha)		Avg.% Increase in yield	Economics of the FLD					
							Avg.cost of cultivation (Rs/ha)		Avg. Gross return		Avg. Benefit-Cost ration	
				Demo	Check		Demo	Check	Demo	Check	Demo	Check
SPICES												
Turmeric	Lakadong, Megha Turmeric-1, Rajendrasonia, Local	35	7.26	123.55	99.18	24.57	114801	119225	336113	290650	2.93	2.44
Ginger	Nadia	32	7.48	172.94	117.43	47.27	120714	250542	397528	335950	3.29	1.34
Chilli	King Chilli and Local	28	7.98	88.67	65.29	35.81	173722	168221	548934	385625	3.16	2.29
Garlic	G-313	10	5	136.00	118.50	15.00	212000	210000	816000	474000	3.8	2.2
Onion	Arka Kalyan, Arka Kirthiman, Bhima Shakti	55	11.2	155.78	109.07	42.82	123817	117857	474120	343975	3.83	2.92
Total		**160**	**38.92**									

Tubers: During the year 2023, 169 demonstrations were conducted on potato and sweet potato crops covering 18.50 ha area (Table 3.7). Demonstration on different varieties of potato (Bhima Shakti, Kurfi Kanchan, Kufri Garima, Kufri Jyoti, Kufri Giriraj, Kurfi Frysona, Kufri Himalini & Kufri Girdhari) produced an average yield of 166.87 q/ha, a 34.39 percent increase above the local check yields of 24.17 q/ha. Similarly, sweet potato cultivars such as Bhu Krishna produced 102.9 q/ha compared to the local check 96.73 q/ha with a 6.39 percent increase in yield over the local check.

Table 3.7: Frontline demonstrations conducted on tuber crops by KVKs of Umiam during 2023

Crop	Variety	No. of Farmers/ Demo.	Area (ha)	Average yield (q/ha)		Avg.% Increase in yield	Economics of the FLD					
							Avg.cost of cultivation (Rs/ha)		Avg. Gross return		Avg. Benefit-Cost ration	
				Demo	Check		Demo	Check	Demo	Check	Demo	Check
TUBER CROPS												
Potato	Bhima Shakti, Kurfi Kanchan, Kufri Garima, Kufri Jyoti, Kufri Giriraj, Kurfi Frysona, Kufri Himalini & Kufri Girdhari	159	18	166.87	124.17	34.39	109386	101770	290069	223561	2.65	2.20
Sweet potato	Bhu Krishna	10	0.5	102.9	96.73	6.39	93750	85000	308700	198460	3.2	2.3
Total		**169**	**18.50**									

Hybrids: To achieve a higher harvest index in crops, KVKs under Zone VII conducted 411 Front Line Demonstrations (FLDs) on hybrids, covering an area of 103.25 hectares. These FLDs included cereals (105), vegetables (51), spices (5), and tuber crops (250). Among the cereals, paddy (85) and maize (20) were the two important hybrids that were demonstrated at the KVK level. In the case of vegetable crops, the FLDs focused on tomato (31), brinjal (15), and broccoli (5). For spice crops, chili (5) was demonstrated. For tuber crops, potato (250) was the primary focus.

The maize hybrid HQPM-5 showed a 22.79 percent increase in yield compared to the local check. The paddy hybrids Suruchi-MRP-540 and CAU-R1 showed a 28.18 percent increase in yield compared to the local check. Hybrids of brinjal, tomato, and broccoli demonstrated yield increases of 83.33 percent, 34.19 percent, and 26.92 percent, respectively. Field pea and rajma showed yield increases of 49.11 percent and 34.64 percent, respectively. The hybrid potato demonstrated a 33.33 percent increase in yield compared to the local check (Table 3.8).

Table 3.8: Frontline demonstrations conducted on Hybrids by KVKs of Umiam during 2023.

Crop	Name of the hybrid	No. of Farmers/ Demo.	Area (ha)	Average yield (q/ha)		% Change
				Demo	Check	
Cereals						
Maize	HQPM 5	20	12	43.10	35.10	22.79
Rice (Paddy)	Suruchi-MRP-540, CAU-R1	85	30.5	41.05	32.03	28.18
Total/Weighted Average of Cereals		105	42.50			
Vegetable Crops						
Brinjal	Arka Harshita	15	3.75	220	120	83.33
Tomato	Arka Samrat, Arka Abhed and Arka Rakshak	31	12	257.87	192.17	34.19
Broccoli	CLX 3512	5	1.5	132	104	26.92
Total/Weighted Average of Vegetables		51	17.25			
Spices						
Chilli (green)	Arka Meghana	5	1	223	163	36.81
Total/Weighted Average of Pulses		5	1			
Tuber crops						
Potato	Kufri Jyoti	250	42.50	280.00	210.00	33.33
Total/Weighted Average of Tuber crops		250	42.50			
Grand Total		**411**	**103.25**			

Agri-based enterprises: The KVKs also demonstrated various enterprises beyond crops, livestock, and fisheries to improve farmers' livelihoods. One promising initiative is the popularization of value addition in crops, as the demand in the region is growing and it fetches a good value in the local market. In 2023, 433 farmers were engaged in value addition of agricultural products, with 111 units established for this purpose. Another popular enterprise among farmers is the nutri-garden, which involved 93 farmers and led to the establishment of 94 units in 2023. Overall, the total number of farmers involved in FLDs under various enterprises was 1,775, with 1,859 units established (3.9).

Table 3.9: Frontline demonstrations conducted on agri-based enterprises by KVKs of Umiam during 2023 (agri-based enterprises)

Category	No. of KVKs	No. of FLDs	No. of Farmers	No. of Units
Apiculture	2	2	13	13
Fish value addition	1	1	10	2
Fodder	1	2	20	20
IFS	5	8	46	38
Jalkund	9	28	74	47
Mushroom	9	9	66	143
Nutri-garden	6	35	93	94
Residue management	1	1	4	4
Vermicompost	7	7	87	87
Value addition	13	15	433	111
Others	22	40	929	1300
Total Enterprises			**1775**	**1859**

Livestock: As many as, 899 demonstrations were conducted, covering various livestock and aquaculture activities. These demonstrations included 271 pigs, 8,792 poultry birds, 128 goats, 77 dairy animals, 215,944 fish fingerlings, and 1,039 ducks. In Meghalaya, 27 demonstrations were held across 54 units. Mizoram conducted 105 demonstrations in 130 units. In Tripura, 185 demonstrations were carried out, covering 434 units. Nagaland conducted 379 demonstrations involving 8,374 animals, including pigs, poultry, cattle, goats, fish, and ducks (Table3.10).

Table 3.10: Frontline demonstrations conducted on livestock and fisheries by KVKs of Umiam during 2023

Enterprise	Manipur		Meghalaya		Mizoram		Tripura		Nagaland		Total	
	No. of farmers/Demo	No. of animals/units	No. of farmers/Demo	No. of animals/units	No. of farmers/Demo	No. of animals/units	No. of farmers/Demo	No. of animals/units	No. of farmers/Demo	No. of animals/ units	No. of farmers/Demo	No. of animals/ units
Piggery	31	130	13	32	40	40	-	-	146	69	230	271
Poultry	83	935	35	305	45	55	13	40	138	7457	314	8792
Goatry	9	18	-	-	5	5	15	40	45	65	74	128
Cattle	-	-	14	22	5	20	3	20	5	15	27	77
Fishery (fingerlings)	46	215720	47	35	5	5	144	134	25	50	267	215944
Duckery	29	529	15	105	5	5	10	200	10	200	69	1039
Total	203	217332	27	54	105	130	185	434	379	8374	899	-

Farm Mechanization: During 2023, 4,710 demonstrations were conducted on improved tools and farm implements, including drudgery reduction technologies, covering an area of 258.3 hectares. Most of these demonstrations (757) focused on plant protection tools and machinery. This was followed by 200 demonstrations on intercultural operation tools and machinery, 153 on harvesting tools and machinery, 65 on post-harvesting and processing equipment, and the rest on sowing and planting tools, irrigation management tools, and other types of machinery (Table. 3.11).

Table 9: Frontline demonstrations conducted on farm mechanization by KVKs of Umiam during 2023

Category	Name of the implement	Crop	No. of KVKs	No. of FLDs	No. of Farmers	Area (ha)
Sowing and planting tools and machineries	Paddy drum seeder	Paddy	1	1	3	3
	Popularization of Zero Till Drill in rice fallow (Pea)	Pea	1	1	5	2
Sub total			2	2	8	5
Intercultural operation tools and machineries	Wheel Hand Hoe	Potato	1	1	200	42
Sub total			1	1	200	42
Irrigation management tools and machineries	Treadle Pump	Vegetable Crops	1	3	3	7.5
	Low-cost rainwater harvesting structure (Jalkund)	Chilli	1	2	2	-
Sub total			2	5	5	7.50
Harvesting tools and machineries	Fruit Harvester	Citrus fruit	1	1	4	1
	Modified hand operated Winnower in Rice	Rice	1	3	3	
	Manual Paddy Thresher	Rice	3	3	130	110
	Maize Sheller	Maize	1	1	10	0
	Tractor drawn Potato Digger	Potato	1	3	3	1.5
	Pedal operated paddy thresher	Paddy	1	3	3	1.5
Sub total			8	14	153	114
Plant protection tools and machineries	Agribot Drone for spraying	Potato, Pea, Rice	1	1	757	84.8
Sub total			1	1	757	84.8
Postharvest processing tools and machineries	Multi crop Thresher	Paddy	1	1	5	5
	Chaff Cutter	Fodder, Maize	2	2	50	-
	Banana Ripening Chamber	Banana	1	1	10	-
Sub total			5	5	65	5
Grand Total			**17**	**26**	**1188**	**258.3**

4 Training for Farmers and Extension Personnel

In 2023, KVKs (Krishi Vigyan Kendras) conducted a comprehensive array of training programs with the aim of equipping farmers, farm women, rural youth, and extension personnel with the latest knowledge and skills in various agricultural and allied activities (Table 4.1). These programs served to keep everyone updated on technological advancements, and government initiatives, and enhance their management capabilities for effective engagement with the farming community. A total of 3474 training courses were organized by KVKs throughout the year. These courses covered diverse thematic areas across rural livelihood options. The duration of each training session varied depending on the content and budgetary considerations. The training endeavours successfully equipped a total of 90059 participants with valuable skills and knowledge. This diverse group included farmers, farm women, rural youth, and extension personnel. The KVKs from various regions played a pivotal role in these efforts, with Manipur hosting 582 courses with 14,110 participants, Meghalaya organizing 1117 courses attended by 19555 participants, Mizoram organizing 579 courses with 17560 participants, Nagaland providing 657 training courses to 18660 participants, and Tripura arranging 539 training courses that were well-received by 16730 participants.

Table 4.1: State-Wise Summary for Training Programmes by KVKs during 2023

Training	Courses (No.)						Participants (No.)					
	Manipur	Meghalaya	Mizoram	Nagaland	Tripura	Total	Manipur	Meghalaya	Mizoram	Nagaland	Tripura	Total
Farmers & Farm Women	316	615	321	400	320	1972	7900	9225	9630	11200	9600	**47555**
Rural Youth	130	240	125	135	92	722	2600	4800	3750	4050	3680	**18880**
Extension Personnel	68	53	56	50	35	262	1360	1060	1680	1250	1050	**6400**
Vocational Training Programme	26	29	32	32	20	139	780	870	1120	960	600	**4330**
Sponsored Training Programme	42	180	45	40	72	379	1470	3600	1350	1200	1800	**9420**
Total	**582**	**1117**	**579**	**657**	**539**	**3474**	**14110**	**19555**	**17530**	**18660**	**16730**	**90059**

Training on Floriculture

Training of Farmers and Extension Personnel

Training for Rural Youth

Training courses organized for rural youth are presented in the table 4.2. During the year 2023, 667 courses were conducted, and 11410 youth were trained (5384 Male and 6026 Female) of which 9835 (5080 Male and 4756 Female) were SC/ST and 1865 (857 Male and 1009 Female) belonged to General Category. The major thrust areas of the training programme included Nursery management, mushroom Production, Beekeeping, seed production, Integrated farming, etc.

Table 4.2:Training Progrmme organized for rural youth by the KVKs of ATARI, Zone VII during 2023

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery Management of Horticulture crops	11	54	181	235	205	41	246	99	110	209
Protected cultivation of vegetable crops	32	61	104	165	84	104	188	145	208	352
Commercial fruit production	7	63	77	140	32	43	75	95	120	215
Integrated farming	75	13	20	33	294	348	642	307	368	675
Seed production	19	40	43	95	292	165	457	344	208	552
Production of organic inputs	50	84	37	121	580	541	1120	640	642	1281
Planting material production	22	79	99	178	118	107	224	265	290	554
Vermiculture	42	60	69	129	421	267	688	413	284	697
Mushroom Production	62	116	107	223	359	435	768	415	558	973
Beekeeping	46	32	0	32	277	675	953	341	771	1113

Repair and maintenance of farm machinery and implements	18	64	0	64	116	161	277	128	237	365
Value addition	13	20	45	65	94	164	258	114	209	323
Small scale processing	1	0	0	0	0	20	20	0	20	20
Post Harvest Technology	8	0	15	15	114	176	291	114	191	306
Tailoring and Stitching	3	0	0	0	41	30	72	41	30	72
Rural Crafts	1	0	15	15	28	27	54	28	42	69
Production of quality animal products	11	36	44	80	108	68	175	64	104	167
Dairying	5	88	80	168	178	26	204	42	58	100
Sheep and goat rearing	10	32	60	92	114	66	180	82	126	208
Piggery	46	72	50	122	187	126	313	207	196	403
Rabbit farming	0	0	0	0	0	0	0	0	0	0
Poultry production	58	21	5	26	269	273	542	290	278	568
Ornamental fisheries	1	0	0	0	10	10	20	10	10	20
Composite fish culture	45	52	35	87	138	198	336	190	233	423
Fish harvest and processing technology	2	14	1	15	14	6	20	28	7	35
Fry and fingerling rearing	1	0	0	0	10	10	20	10	10	20
Other	113	99	92	191	1347	1092	2438	1578	1315	2893
Total	**667**	**857**	**1009**	**1865**	**5080**	**4756**	**9835**	**5384**	**6026**	**11410**

Training for Farmers and Farm Women

The training programs organized for farmers and farm women in farmers and farm women by the KVKs under Zone VII are detailed in table 4.3. by KVKs are detailed in table 4.3. The data reveals that 3574 training courses were conducted, benefiting 78,473 Farmers and Farm Women. Among these participants, 42,267 were male, and 51,307 were female. Additionally, out of the total participants, 47,570 belonged to the SC/ST category, while 25,440 were from the General category. These training programs covered various important areas, including Crop Production (439 courses), Horticulture (692 courses), Soil Health and Fertility Management (150 courses), Livestock Production and Management (375 courses), Home Science and Women Empowerment (120 courses), Agricultural Engineering (69 courses), Plant Protection (545 courses), Fisheries (253 courses), Production of Input on-site (336 courses), Capacity Building and Group Dynamics (583 courses), and Agro-forestry (13 courses).

Table 4.3 : Training programmes conducted for Farmers and Farm Women by KVKs during 2022

Area of trainings	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop Production	12	1141	1044	2184	4460	3714	8174	6657	5129	11786
Horticulture										
a) Veg. Crops	268	750	926	1413	2456	1764	4220	3371	2862	6029
b) Fruits	65	632	817	1449	219	395	613	945	1296	2250
c) Ornamental Plants	30	292	443	735	26	117	144	319	560	879
d) Plantation crops	6	63	77	140	48	19	67	111	96	207
e) Tuber crops	18	126	144	270	179	88	267	305	232	536
f) Spices	30	32	39	70	211	297	509	283	472	715
g) Medicinal and Aromatic Plants	275	1690	2471	3873	1740	1734	3143	3758	4461	7600
Soil Health and Fertility Management	150	40	10	50	1542	1851	3393	1542	1861	3443
Livestock Production and Management	375	667	490	1157	3327	3851	7178	4438	4617	8975
Home Science/Women empowerment	120	183	408	303	336	1981	1986	519	2389	2289
Agril. Engineering	69	234	610	556	395	469	533	709	1079	1089
Plant Protection	545	2576	2160	4160	4937	5236	9511	8101	7464	14247
Fisheries	253	834	1882	1852	1505	1673	2185	2975	3699	4657
Production of Input at site	336	1170	3050	2780	749	2041	1135	2331	5223	4219
Capacity Building and Group Dynamics	583	1872	4880	4448	2602	4292	4246	3922	9712	9286
Agro-forestry	13	0	0	0	111	157	268	1983	157	268
Total	**3574**	**12301**	**19450**	**25440**	**24843**	**29678**	**47570**	**42267**	**51307**	**78473**

Training for Extension Personnel

In the year 2023, a series of diverse training programs aimed at enhancing the knowledge and skills of extension personnel in the agricultural sector were organized, with the objective of keeping them updated on cutting-edge agricultural technology developments. The specifics of these training programs for extension personnel are summarized in Table 4.4. A total of 261 capacity development courses were conducted, benefiting 4032 in-service extension personnel, consisting of 2219 males and 1813 females. Among these participants, 3046 individuals (1519 males and 1527 females) were from the SC/ST category,

while 622 participants (456 males and 166 females) belonged to the general category. These 261 courses covered a wide range of crucial areas, including improving field crop productivity, integrated pest management, integrated nutrient management, revitalizing aging orchards, adopting protected cultivation technology, promoting the production and utilization of organic inputs, mainstreaming gender through self-help groups (SHGs), and ensuring the care and maintenance of farm machinery and implements.

Table 4.4: Training programmes conducted for Extension Personnel by KVKs during 2022

Area of trainings	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	25	25	10	35	75	162	237	120	200	320
Integrated Pest Management	16	47	12	59	160	80	240	150	100	250
Integrated Nutrient management	10	6	2	8	61	25	86	70	56	126
Rejuvenation of old orchards	6	0	0	0	58	40	98	55	41	96
Protected cultivation technology	24	18	13	31	111	45	156	138	69	207
Production and use of organic inputs	26	35	5	40	162	160	322	155	168	323
Care and maintenance of farm machinery and implements	0	0	0	0	0	0	0	0	0	0
Gender mainstreaming through SHGs	2	0	0	0	98	32	130	98	28	126
Formation and Management of SHGs	5	15	10	25	19	20	39	55	27	82
Women and Child care	2	0	0	0	7	43	50	15	43	58
Low cost and nutrient efficient diet designing	2	0	0	0	0	40	40	0	43	43
Group Dynamics and farmers organization				0			0			0
Information networking among farmers	12	67	20	87	31	85	116	150	120	270
Capacity building for ICT application	3	0	0	0	50	43	93	52	43	95
Management in farm animals	3	1	0	1	12	20	32	10	18	28
Livestock feed and fodder production	15	26	0	26	110	125	235	140	120	260
Household food security	22	25	5	30	80	90	170	111	120	231
Other	8	3	0	3	35	65	100	50	72	122
Total	80	188	89	277	450	452	902	850	545	1395

Sponsored training programmes

During the reporting period, KVKs of ATARI Zone VII conducted a range of sponsored capacity development training programs, as outlined in Table 4.5. The data reveals that a total of 415 sponsored capacity development courses were organized, benefitting 8,969 participants. Among these participants, 4,407 were male, and 4,562 were female. Furthermore, 7,927 participants hailed from the SC/ST category, with 3,758 males and 4,169 females, while 902 participants belonged to the general category, consisting of 565 males and 337 females. These sponsored training programs catered to a diverse audience, including farmers, farm women, rural youth, in-service extension personnel, and members of various NGOs and civic organizations. These programs were designed to enhance their knowledge and skills in key areas such as crop production and management (149 courses with 3,493 participants), post-harvest technology and value addition (35 courses with 515 participants), farm machinery (8 courses with 195 participants), livestock and fisheries (183 courses with 3,801 participants), home science (19 courses with 252 participants), and agricultural extension (21 courses with 713 participants).

Table 4.5 :Sponsored training programmes conducted by KVKs during 2023

Area of trainings	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management										
Crop production and management	5	220	97	317	1540	1552	3092	1813	1680	3493
Post harvest technology and value addition	35	30	68	98	104	313	417	134	381	515
Farm machinery	8	13	37	50	69	76	145	82	113	195
Livestock and fisheries	183	225	75	300	1754	1691	3445	2010	1791	3801
Home Science	19	0	41	41	32	179	211	32	220	252
Agricultural Extension	21	77	19	96	259	358	617	336	377	713
Total	**415**	**565**	**337**	**902**	**3758**	**4169**	**7927**	**4407**	**4562**	**8969**

Vocational training programmes

Vocational capacity development programs conducted by KVKs of ATARI Zone VII are presented in table 4.6. The information indicates that a total of 140 vocational capacity development courses were organized, benefitting 1524 participants. Among these participants, 701 were male, and 823 were female. Moreover, 1,070 participants (499 males and 571 females) were from the SC/ST category, while 427 participants (284 males and 143 females) belonged to the general category. The participants in these vocational training programs primarily consisted of farmers, farm women, and rural youths. The main objective of these programs was to enhance their knowledge and skills in critical areas such as crop production and management (42 courses with 306 participants), post-harvest and value addition (30courses with 296 participants), livestock and fisheries (29 courses with 397 participants), and income generation activities (39 courses with 525 participants).

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Table 4.6. Vocational training programmes conducted by KVKs during 2023

Area of trainings	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management	42	51	20	71	104	75	179	181	125	306
Post Harvest and Value addition	30	8	35	43	62	105	167	85	211	296
Livestock and fisheries										
Dairy farming	5	10	0	10	5	0	5	24	15	39
Composite fish culture	5	50	9	59	25	34	59	80	45	125
Sheep and goat rearing	1	10	0	10	5	1	6	0	0	0
Piggery	7	35	12	47	35	20	55	40	40	80
Poultry farming	8	40	12	52	50	20	70	45	30	75
Others	3	10	0	10	30	50	80	28	50	78
Income generation activities										
Vermi-composting	10	10	15	25	65	40	105	60	51	111
Production of bio-agents, bio0pesticides,	4	0	0	0	12	22	34	10	20	30
Mushroom cultivation	15	30	25	55	71	142	213	80	166	246
Seed production	5	25	10	35	10	10	20	20	20	40
Tailoring, stitching, embroidery, dying etc.	0	0	0	0	0	20	20	0	20	20
Other	5	5	5	10	25	32	57	48	30	78
Total	**140**	**284**	**143**	**427**	**499**	**571**	**1070**	**701**	**823**	**1524**

5 Extension Activities

During the reporting year, the KVKs in the region were involved in several extension programmes for different activities. Along with traditional media of technology dissemination, the KVKs used recent technological innovations like ICTs to reach among the unreached. A vast stretch of the region, being extremely remote to access technology is a huge challenge. In this context, the efforts by the KVKs during 2023 to disseminate improved technologies and practices by exploring more extension approaches suitable for Northeastern region are praiseworthy. The KVKs of ATARI, Umiam carried out 19041 extension programmes/activities reaching over 186410 farmers and other targeted beneficiaries including men and women from general and SC/ST categories of farmers including extension personnel in the region. The extension activities conducted by the KVKs of the institute have been categorized into five major groups, namely field trips and visits, group activities, mass outreach programmes, camps, and campaigns

and publications. The highest number (7427) of activities was conducted under the category of mass outreach programme, while the highest number (67938) of beneficiaries had been served through different mass outreach programmes of KVKs. Detailed information on the extension activities, including several beneficiaries are given in Table 5.1.

Table 5.1: Extension activities conducted by KVKs during 2023

Category	Extension Activity	No. of activities	Participants											
			General -1			SC/ST -2			Extension Officials -3			Grand Total (1+2)		
			M	F	T	M	F	T	M	F	T	M	F	T
Field Trips and Visits	Diagnostic visits	2339	745	274	1019	3972	3208	7180	40	56	96	4717	3482	8199
	Scientists visit farmers field	2651	393	332	725	4671	5215	9886	20	35	55	5064	5547	10611
	Exposure visits	38	107	88	195	479	521	1000	2	12	14	586	609	1195
	Farmers Visit to KVK	1746	1964	471	2435	4328	4296	8624	12	20	32	6292	4767	11059
	Field Visit	133	26	17	43	291	312	603	6	4	10	317	329	646
	Total	**6907**	**3235**	**1182**	**4417**	**13741**	**13552**	**27293**	**80**	**127**	**207**	**16976**	**14734**	**31710**
Group activities	Farmers Scientist Interaction	185	142	152	294	2358	2600	4958	17	46	63	2500	2752	5252
	Group Discussion	749	664	726	1390	6282	5576	11858	42	129	171	6946	6302	13248
	KisanGosthi	66	47	89	136	1016	1221	2237	4	4	8	1063	1310	2373
	Mahila Mandal Conveners' meetings	2	0	19	19	30	29	59	0	0	0	30	48	78
	SHG formation	6	0	0	0	20	192	212	0	0	0	20	192	212
	Method Demonstrations	726	348	437	785	4476	5670	10146	51	141	192	4824	6107	10931
	Farm Science Club Conveners meet	3	67	57	124	48	34	82	0	0	0	115	91	206
	Lecture Delivered as a resource person	265	86	135	221	3455	3590	7045	54	102	156	3541	3725	7266
	Ex-trainees Sammelana	6	65	64	129	98	97	195	0	0	0	163	161	324
	Resource person	31	11	9	20	397	443	840	0	0	0	408	452	860
	Total	**2039**	**1430**	**1688**	**3118**	**18180**	**19452**	**37632**	**168**	**422**	**590**	**19610**	**21140**	**40750**

Mass outreach programmes	Advisory Services	6387	4720	1985	6705	9086	5904	14990	371	112	483	13806	7889	21695
	Kisan Mela	21	142	40	182	1384	1203	2587	4	4	8	1526	1243	2769
	Exhibition	63	510	608	1118	9902	9378	19280	52	109	161	10412	9986	20398
	Farmers Seminar/ workshop	45	53	0	53	350	307	657	8	8	16	403	307	710
	Field Day	185	575	301	876	2140	2052	4192	79	130	209	2715	2353	5068
	PRA	18	7	16	23	160	162	322	0	0	0	167	178	345
	Celebration of important days	212	366	231	597	3929	4431	8360	102	178	280	4295	4662	8957
	TV Talks	28	0	0	0	0	0	0	0	0	0	0	0	0
	Radio talks	48	0	0	0	0	0	0	0	0	0	0	0	0
	Film shows	232	206	152	358	2458	2773	5231	19	44	63	2664	2925	5589
	Newspaper coverage	188	0	7	7	1215	1185	2400	1000	1000	2000	1215	1192	2407
	Total	**7427**	**6579**	**3340**	**9919**	**30624**	**27395**	**58019**	**1635**	**1585**	**3220**	**37203**	**30735**	**67938**
Camps and Campaigns	Animal Health Camp	39	101	71	172	1586	1276	2862	30	47	77	1687	1347	3034
	Plant Health Camp	15	69	20	89	624	507	1131	7	6	13	693	527	1220
	Awareness Camp	291	529	392	921	3819	3804	7623	18	74	92	4348	4196	8544
	Soil testing Campaigns	791	0	0	0	1145	637	1782	1	2	3	1145	637	1782
	Soil health camp	21	7	33	40	356	345	701	16	14	30	363	378	741
	Vaccination camp	2	0	0	0	3	18	21	0	0	0	3	18	21
	Total	**1159**	**706**	**516**	**1222**	**7533**	**6587**	**14120**	**72**	**143**	**215**	**8239**	**7103**	**15342**

Publications	Training/ practical manual	12	0	0	0	2220	1105	3325	250	100	350	2220	1105	3325
	Extension literature	50	0	0	0	3674	1794	5468	45	32	77	3674	1794	5468
	Research Papers	18	0	0	0	15	15	30	0	0	0	15	15	30
	Popular articles	57	0	0	0	0	0	0	0	0	0	0	0	0
	Electronic media (CD/DVD)	4	0	0	0	0	0	0	0	0	0	0	0	0
	Leaflets/folders	100	0	0	0	1670	1574	3244	5	5	10	1670	1574	3244
	Technical bulletins	7	0	0	0	0	0	0	0	0	0	0	0	0
	Others	1261	1472	1508	2980	7324	8299	15623	211	449	660	8796	9807	18603
	Total	1509	1472	1508	2980	14903	12787	27690	511	586	1097	16375	14295	30670
	Others	5076	2335	1538	3873	12572	11221	23793	107	72	179	14907	12759	27666
	Total	**5371**	**3375**	**1901**	**5276**	**20600**	**16921**	**37521**	**137**	**85**	**222**	**23975**	**18822**	**42797**
	Grand Total	**19041**	**13422**	**8234**	**21656**	**84981**	**79773**	**164754**	**2466**	**2863**	**5329**	**98403**	**88007**	**186410**

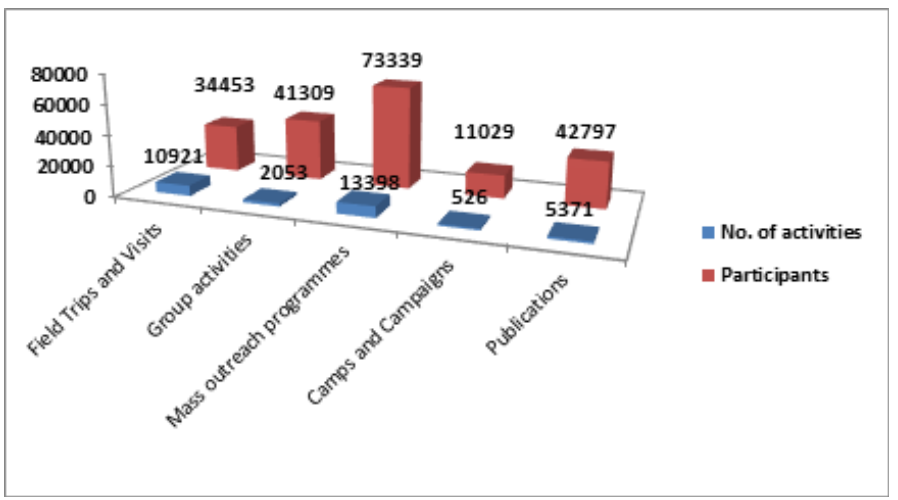

Fig 5.2: Category wise extension activities conducted by the KVKs during 2023

6 Agricultural Inputs (Seeds and Planting Material) Production

Timely availability of quality agricultural inputs such as seeds, planting materials, livestock breeds, and bio-products are essential to attain potential yield. Hence, KVKs are actively involved in the production of technological inputs. Production of quality seeds and planting materials and their supply to the farmers were among the important activities undertaken by the KVKs in the Zone. During the reporting period, KVKs of the institute produced *5160.24* q of quality seeds, 1742317 planting materials, 453.57 q of bio-products, and 1361353 of livestock animals, which included fish fingerlings. A total of 1727.09 q cereals seeds with the highest in the state of Manipur (945.43 quintals), Oilseeds (959.63 q), Pulses (546.04 q), 63.834 q seeds of Vegetables, 668.35 q seeds of Spices, fruits (6 q) and 1188 q commercial crops were produced by the KVKs in the zone. Planting materials of fruits (82737), plantation crops (7069), vegetables (1575777), spices (38804), forest species (14820), commercial crops (13580), ornamental plants (8900), and others (630) were

Seed Production by KVK Lawngtlai district

produced for supply and distribution to farmers. The KVKs of the zone also produced a total of 453.57 q of bio-products including 429.32 q of bio-fertilizers, 0.14 q of bio-agents, and 24.11 q of other bio-products. Among the livestock products produced by the KVKs during the reporting period were 28447 livestock strains and 13.32 lakh fingerlings were produced. The state-wise details of agricultural inputs production are provided in Table 6.1.

Table 6.1: State-wise details of seeds and planting materials production by KVKs during 2023

Major Group/Class	State					Total (Qtls)
A. Seed Materials	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Tripura**	
Cereals	945.43	51.41	281.2	16.9	432.15	**1727.09**
Oilseeds	608	44	81.6	10.05	215.98	**959.63**
Pulses	268.3	32.5	70.9	3.32	171.02	**546.04**
Vegetables	3.55	0.064	10.4	18.32	31.5	**63.834**
Spices	625	17	-	23	3.35	**668.35**
Commercial crops	-	22	1012	118	36	**1188**
Fruits	-	-	-	-	6	**6**
Others	-	0.3	-	-	1	**1.3**
Total	**2450.28**	**167.27**	**1456.1**	**189.59**	**897**	**5160.24**

B. Planting Materials (Nos.)						
Vegetables	481487	151400	692800	122240	127850	**1575777**
Spices	29500	98	6000	2700	506	**38804**
Fruits	17880	7835	40840	7500	8682	**82737**
Forest Spp	14400		300	-	120	**14820**
Ornamental Plants	-	1500	800	-	6600	**8900**
Plantation Crops	-	-	2000	-	5069	**7069**
Commercial Crop	-	-	500	80	13000	**13580**
Others	-	630	-	-	-	**630**
Total	**543267**	**161463**	**743240**	**132520**	**161827**	**1742317**
C. Bioproducts						
Biofertilizers	40.55	40.62	289.74	31.91	26.5	**429.32**
Bio agents	-	0.14	-	-	-	**0.14**
Others	6		-	-	18.11	**24.11**
Total	**46.55**	**40.76**	**289.74**	**31.91**	**44.61**	**453.57**
D. Livestock &Fingerlings (Nos.)						
Livestock Strains	190	12040	3993	1410	10814	**28447**
Fingerlings	744700	29500	-	-	558706	**1332906**
Total	**744890**	**41540**	**3993**	**1410**	**569520**	**1361353**

7 Research and development projects for human resource development

A. National Innovations in Climate Resilient Agriculture (NICRA)

During the year 2023-24, KVKs under the NICRA project were 15 in 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 location. The FSTs were identified based on the climatic constraints faced by the district so that mitigation techniques could apply to all the farming villages in the district. Climate resilient interventions were undertaken based on the identified Farming System Typologies and the activities were further divided into Natural Resources Management, Crop Production, Livestock and Fisheries interventions, Capacity Building activities, and Extension activities. The details of the interventions are as follows:

Natural Resource Management: Under this, climate resilient in-situ practices such as mulching, ridge, and furrow cultivation methods, zero tillage, integrated farming system, crop diversification through the raised bed in fallow land, and ex-situ cultivation practices like protected cultivation of crops, farm pond, and jalkund, along with soil and water management techniques like growing of cover crops, organic nutrient incorporation, low-cost vermicomposting, early sowing to escape moisture stress and slurry method of Phosphorus management in paddy were demonstrated in the adopted NICRA villages. A total of 308 demonstrations were conducted, covering an area of 78.53 ha and 18 units under NRM, benefiting 405 farmers during 2023-24.

Crop residue mulching in winter vegetables

Crop residue mulching in winter vegetables

Crop Production : The climate resilient technologies for crop production that was practiced during 2023-24 were the cultivation of improved crop varieties that could withstand certain climatic stresses, sequential cropping system, intercropping techniques, mushroom cultivation, community nursery during unfavorable conditions, paddy-cum-fish culture, maize-based cropping system, a system of rice intensification (SRI), seed production and safe storage. A total of 678 demonstrations were conducted, covering an area of 218.82 ha and 73 units under crop production activities and benefiting 800 farmers during 2023-24.

Intercropping system (Cabbage + Tomato), KVK Lunglei

Intercropping of Maize + Soybean, KVK Lunglei

Livestock and Fisheries : Activities that were conducted under livestock and fisheries intervention by the KVKs in the NICRA villages were animal health camps cum vaccination drives, rearing of improved breeds of livestock having stress tolerance, improved feeding methods, improved scientific housing for livestock, composite fish farming instead of monoculture of fish and integrated farming systems with livestock and fisheries. A total of 539 demonstrations were conducted, covering an area of 24.38 ha and 942 units under different management practices, hence, benefitting 529 farmers under livestock and fisheries intervention.

Improved housing for Heat Stress Management, KVK Lunglei

Deep litter system in poultry rearing, KVK Senapati

Capacity Building Programmes – Capacity building programmes conducted by the KVKs in the NICRA-adopted villages aim to establish and strengthen the farmer groups. Programmes such as plant protection techniques, updated farming technologies, food preservation and safe storage, integrated nutrient management, scientific management of raising livestock, etc., were conducted during 2023-24. A total of 155 capacity-building programmes were conducted, benefiting 3307 individuals.

Demonstrations conducted in farmers field

Demonstration on community nursery raising

Extension activities – Extension activities conducted by KVKs in NICRA-adopted villages contribute to rural communities' overall development and well-being by equipping them with the knowledge and tools needed to thrive in a changing climate. Extension activities such as field visits, diagnostic visits, awareness programmes, institutional visits, etc., were conducted during 2023-24. A total of 226 programmes were conducted and beneficiaries covered under extension activities during 2023-24 were 3999.

Field day on integrated pest management in crops

Field day on integrated pest management in crops

B. Farmer FIRST Programme (FPP)

The Farmer FIRST project, conceptualized and executed by ICAR, aims to engage active farmers in identifying and prioritizing research problems and conducting experiments in their fields using available resources. This approach centers on the Farmer's Farm, Innovations, Resources, Science, and Technology, often referred to as "FIRST." In

the Indian context, Farmer FIRST embodies the notions of "enriching knowledge" and "integrating technology." Enriching knowledge highlights the importance of mutual learning between the research system and farmers, taking into account the existing farm environment, perceptions, and interactions with surrounding sub-systems. Technology integration emphasizes the need for scientific research outputs to be adapted and customized to fit the conditions on farmers' fields for successful adoption and acceptance. The Farmer FIRST program aims to strengthen the interaction between farmers and scientists for technology development and application, emphasizing innovation, technology, feedback, involvement of multiple stakeholders, diverse realities, various methodological approaches, and interventions related to vulnerability and livelihoods.

Currently, two projects are in progress, one by the Central Agricultural University in Imphal and the other by ICAR RC for the NEH Region in Umiam. These projects have been implemented in two villages under CAU, Maopungdong village in Senapati district and Sangshak Khullen Village in Ukhrul District and ten villages in the Ri Bhoi district under ICAR RC for NEH Region, including Borgang, Sarikhusi Lalumpam, Purangang, Umtham, Borkhatsari, Nalapara, Nangagang, Mawphrew, and Mawtnum.

Module-wise achievements under FFP during 2023-24 Crop-based Module- CAU Imphal initiated scientific Sweet Corn (Golden Cob F1) cultivation in Manipur's Ukhrul and Senapati districts, while ICAR RC in Umiam led the initiative for double cropping in fallow rice fields. These collaborative efforts are aimed at enhancing agricultural productivity and generating increased income and job prospects for local farmers. This joint endeavor resulted in the successful execution of 5 demonstrations, benefiting 180 beneficiaries from the local farming communities.

1. **Horticulture-based module-** To boost potato cultivation, the Kurfi Joyti variety was introduced in the adopted villages, with a cultivation area of 0.25 hectares in Maopungdong and an additional 0.25 hectares in Shangshak Khullen, Ukhrul district. In addition to potatoes, fruit crops like lemon and pineapple were also introduced as alternative income sources. These efforts led to the successful execution of four demonstrations, benefiting a total of 47 farmers through these interventions.
2. **Livestock-based module-** Through the interventions 20 Yorkshire breed piglets and 1590 improved breed poultry birds were distributed to 91 farmers, aiming to boost income generation through pig farming and poultry production.
3. **Enterprise-based module-** As part of the Enterprise-based module CGI sheets were distributed to set up a mushroom spawn production unit in the adopted village. Moreover, mushroom spawns were distributed to boost farmers' income. In addition, a trial at a poultry hatchery was conducted using 200 fertile eggs, utilizing an automatic egg incubator situated at the custom hiring center in the adopted village. Under this enterprise-based module, 7 demonstrations were organized benefiting a total of 18 beneficiaries.
4. **NRM Based module**- In the NRM Based module, 5 demonstrations were conducted, benefiting 34 farmers. Jalkunds cost-effective hilltop micro rainwater harvesting structures were constructed for rainwater collection and storage. These structures serve various purposes during dry seasons, including essential irrigation during critical crop growth stages, washing produce like ginger and turmeric, supporting animal husbandry and livestock, and meeting domestic water needs. Furthermore, Azolla,

a floating fern recognized for its value as a bio-fertilizer in wetland paddy fields, was introduced and recommended for use as fish feed due to its nutritional richness and cost-effectiveness. To promote vermicomposting, vermi-compost beds were distributed.

5. **Fishery-Based Module:** Under the Fishery-Based module 3 demonstrations were conducted to benefit 30 beneficiaries. FFP Centre at ICAR RC Umiam distributed 1500 fingerlings of Rohu, Gania, and Guchi breeds to 10 farmers in the Marngar Cluster, promoting fishery as an alternative income source. Meanwhile, 4500 fingerlings of Rohu, Mirgal, Grass carp, and silver carp were distributed to 20 farmers by CAU Imphal. A fishery training program was also conducted to encourage farmers to adopt fishery as an alternate source of livelihood for doubling their income.
6. **IFS-Based Module -**3 demonstrations were conducted with the participation of 3 beneficiaries to showcase the development of Integrated Farming Systems in the project sites. Integrated farming systems offer the opportunity to increase economic yield per unit area and time through the intensification of crops and allied enterprises. The Integrated Farming System was established in the adopted villages to enhance the annual income of local farmers.
7. **Farm Mechanization** -The beneficiaries received a set of farm mechanization tools and equipment, including Tulu pumps designed for irrigation to eliminate the manual water transport effort in hilly areas, Knapsack sprayers equipped with precision spray guns for precise application of chemicals, insecticides, and pesticides on individual plants. In addition, farmers also received 2 dewatering pumps with accompanying pipes, 2 grass cutters, 20 knapsack sprayers, and various essential farm implements such as 20 garden hoes, 20 shovels, 20 hand cultivators, and 20 sickles which will benefit around 514 farmers through custom hiring centers.
8. **Extension activities**: Under extension activities. A total number of 17 trainings/ demonstrations/ programmes had been conducted during the year with 973 total participants.

Table 7.1: Module-wise achievements under FFP during 2023

Module Wise	CAU, Imphal		ICAR RC Complex, Umiam		Total	
	No. of Demos	No. of Beneficiaries	No. of Demos	No. of Beneficiaries	No. of Demos	No. of Beneficiaries
Crop Based Module	2	20	3	160	**5**	**180**
Horticulture Based Module	2	20	2	27	**4**	**47**
Livestock Based Module	2	40	3	51	**5**	**91**
Enterprise Based module	4	9	3	9	**7**	**18**
NRM Based module	2	20	3	14	**5**	**34**
Fishery Based Module	2	20	1	10	**3**	**30**
IFS Based Module	2	2	1	1	**3**	**3**
Extension Activities	7	575	10	398	**17**	**973**
Farm Mechanization	2	500	2	14	**4**	**514**

C. Attracting and Retaining Youth in Agriculture (ARYA)

Agriculture in India is facing significant challenges due to declining interest among the youth in pursuing farming, leading them to migrate to urban areas in search of non-farming jobs. This trend poses a threat to food security, and it is crucial to encourage young individuals to remain engaged in agriculture. The exodus of rural youth to cities continues to grow, and the presence of small land holdings presents a formidable challenge to ensure food security for the increasing population. The key solution to attract young people to agriculture is to transform farming into a profitable and appealing option in rural regions. Recognizing the vital role of rural youth in agricultural development, particularly in safeguarding the country's food security, the Indian Council of Agricultural Research (ICAR) has launched the "Attracting and Retaining Youth in Agriculture (ARYA)" program.

Project ARYA was launched in six Krishi Vigyan Kendras (KVKs) within the specified zone to improve the livelihoods of rural youth. The primary objective of the program was to engage and empower young individuals to venture into various agriculture and allied service sector enterprises, given the common trend of educated rural youth migrating to urban areas in search of employment opportunities. However, with the successful implementation of Project ARYA in three specific KVKs, namely Wokha (Nagaland), Lunglei (Mizoram), and Senapati (Manipur), as well as Jaintia Hills (Meghalaya), Tuensang (Nagaland), and Dhalai (Tripura) under ICAR-ATARI, Umiam, the youth in the North-Eastern Region have increasingly embraced agriculture

and allied activities as their primary source of income and a means of employment generation.

Salient features of ARYA

During 2023, the Krishi Vigyan Kendras (KVKs) of Umiam, including Senapati in Manipur, Lunglei in Mizoram, Wokha in Nagaland, Jaintia Hills in Meghalaya, Tuensang in Nagaland, and Dhalai in Tripura, conducted a variety of activities under the ARYA program (Table). These activities encompassed training and demonstrations in diverse agricultural sectors. Notable activities included mushroom production, poultry, piggery, fish production, large cardamom production, beekeeping, vermicomposting, protected cultivation, and more. The KVKs collectively engaged with 203 units and 79 training courses were conducted during the year 2023. A total of 1642 rural youths were trained, comprising 887 male and 755 female. These efforts contributed significantly to enhancing agricultural knowledge and practices in the region, promoting sustainable farming and livelihoods.

Table 7.2: Activities conducted under ARYA by KVKs of Umiam during 2023

Name of KVK	Name of enterprise/ Component	No. of unit	No. of training	No. of Youths trained		
				Male	Female	TOTAL
Senapati, Manipur	Mushroom Production	17	2	25	15	40
	Poultry	38	2	26	24	50
	Piggery	8	2	25	15	40
	Fish production	9	2	18	12	30
	Protected cultivation	21	2	0	50	50
	Large Cardamom Production	7	2	25	15	40
	Floriculture					0
Lunglei Mizoram	Poultry	10	5	78	33	111
	Piggery	13	5	72	34	106
	Mushroom Cultivation	5	6	25	86	111
	Bee Keeping	8	5	67	22	89
	Vermi Composting	4	6	93	27	120
	Protected Cultivation	9	5	84	60	144
Wokha Nagaland	Piggery	1	2	14	36	50
	Poultry		2	37	13	50
	Mushroom	2	2	14	16	30
	Protected Cultivation	2	2	5	25	30
	Fishery	2	1	4	16	20
Jaintia hills, Meghalaya	Mushroom Production	1	0	0	0	0
	Vermicompost unit	1	0	0	0	0
	Poultry Production	1	0	0	0	0
	Piggery	1	0	0	0	0
	Processing & value addition	1	0	0	0	0
Tuensang, Nagaland	Mushroom Cultivation	5	4	11	49	60
	Poultry	10	4	15	45	60
	Nursery Raising Of Vegetables	5	4	45	15	60
	Protected Cultivation	5	4	45	15	60
Dhalai, Tripura	Piggery	5	4	72	41	113
	Poultry	6	3	51	34	85
	Mushroom	6	3	36	57	93
Total		**203**	**79**	**887**	**755**	**1642**

Cluster FLDs under National Food Security Mission (NFSM) during 2023-24

Under ICAR-ATARI Zone-VII, there were 21 KVKs selected for implementation of the Cluster Demonstration programme. These KVKs organized farm and extension activities for farmers and extension workers to disseminate various technologies and conducted Cluster Front Line Demonstrations (CFLDs) to demonstrate the production potential of newly released technologies on farmer's fields at various locations in each farming system.

Achievements during 2023-24

During the year 2023-24, a total of 1371 nos. of CFLDs were conducted on Oilseeds in 5 Northeastern States of Manipur, Meghalaya, Nagaland, Mizoram, and Tripura spanning 595 hectares. In Oilseed crops, CFLDs were conducted in Soybean (DSb-19, JS-95-60, JS 335, Soya VL 79), Sesame (var. Chhibung) Groundnut (var. ICGS-76), Sunflower (DRSH 1), and Rapeseed & Mustard (NRCHB-101, TS-67, TS 36 & TS 38).

Table 7.3: State-wise Cluster Front Line Demonstration on Oilseeds under NFSM & NMOOP 2023-24

State	Area(ha) Allocated	Area (ha) Covered	Demo (Allocated)	Demo (Conducted)
Manipur	250	250	700	624
Meghalaya	70	70	175	175
Mizoram	125	90	300	130
Nagaland	90	90	225	225
Tripura	100	95	250	217
Total	**635**	**595**	**1650**	**1371**

The selected KVKs in the states of Manipur, Meghalaya, Mizoram, and Nagaland, displayed the state-wise productivity of oilseed crops under NFSM during 2023–24 in which the highest average yield level of Soybean was recorded in Mizoram with average yield of 20.67 q/ha followed by Nagaland (18.76 q/ha), Meghalaya (17.64 q/ha) and Manipur with 11.73 q/ha. KVKs in Manipur indicated that the average zonal yield for groundnut (var. Groundnut, ICGS-76) was 11.73 q/ha, while the average zonal yield for sesame (var. Chhibung and Tripura Siphing) was 8.43 q/ha. All five states under the Zone demonstrated their ability to produce rapeseed and mustard (Var. NRCHB-101, TS-67, TS 36, & TS 38) with an average yield of 9.47q/ha. An average yield of the Sunflower was recorded by KVK Serchip, Mizoram about 11.5 q/ha.

Table 7.4: State-wise Productivity of Oilseed crops under NFSM during 2023-24

Sl. No	State	Kharif (Qtl/ha)			Rabi (Qtl/ha)	Summer (Qtl/ha)	
		Soybean (DSb-19, JS-95-60, JS 335, Soya VL 79)	Groundnut (ICGS-76)	Sesame (Chhibung, Tripura Siping)	Rapeseed & Mustard (NRCHB-101, TS-67, TS 38 & TS 36)	Sunflower	Sesame (Tripura Siphing)
1	Manipur	13.57	11.73	-	9.4	-	-
2	Meghalaya	17.64	-	-	10.53	-	-
3	Mizoram	20.67	-	7.9	9.1	11.5	-
4	Nagaland	18.76	-	-	9.17	-	-
5	Tripura	-		8.48	9.17	-	8.93

CFLD on Minimum tillage cultivation of rapeseed

CFLD on INM in Groundnut

The flowering stage of Sunflower

CFLD on soybean

Cluster FLDs under National Food Security Mission (NFSM) during 2023-24

Under ICAR-ATARI Zone-VII, there were 19 KVKs selected for implementation of Cluster Demonstration programme on Pulses. These KVKs organized farm and extension activities for farmers and extension workers to disseminate various technologies and conducted Cluster Front Line Demonstrations (CFLDs) to demonstrate the production potential of newly released technologies on farmer's fields at various locations in a given farming system.

Achievements during 2023-24

During the year 2023-24 a total of 141 nos. of CFLDs were conducted on Pulses in 5 Northeastern States of Manipur, Meghalaya, Nagaland, Mizoram and Tripura spanning 54.82 hectares. In Pulses crops, CFLDs were conducted in Blackgram (PU-31 and Tripura Mashkoloi), and Lentil (IPL-316, HUL-57, WBL-77, Tripura Lentil Selection -1 and Pusa Ageti).

Table 7.5: State-wise Cluster Front Line Demonstration on Oilseeds under NFSM 2023-24

State	Area(ha) Allocated	Area (ha) Covered	Demo (Allocated)	Demo (Conducted)
Manipur	20	16	50	37
Meghalaya	4	0	10	0
Mizoram	14	3	35	8
Nagaland	10	3.25	25	10
Tripura	47	32.57	118	86
Total	**95**	**54.82**	**238**	**141**

The selected KVKs in the states of Manipur, Meghalaya, Mizoram and Nagaland, displayed the state-wise productivity of Pulses crops under NFSM during 2023-24 in which the highest average yield level of Blackgram was recorded in Manipur with an average yield of 8.72 q/ha followed by Tripura (8.01 q/ha). KVKs in Manipur indicated that the average zonal yield for Lentil was 9.88 q/ha, followed by Mizoram (8.00 q/ha), Tripura (7.24 q/ha) and Nagaland (7.00 q/ha).

Table 7.6: State-wise Productivity of Oilseed crops under NFSM during 2023-24

Sl. No	State	Kharif (Qtl/ha)	Rabi (Qtl/ha)	
		Blackgram (PU-31)	**Lentil** (IPL-316, HUL-57, WBL-77, Tripura Lentl Selection -1, Pusa Ageti)	**Blackgram** (Tripura Mashkoloi)
1	Manipur	8.72	9.88	-
2	Meghalaya	-	-	-
3	Mizoram	-	8.00	-
4	Nagaland	-	7.00	-
5	Tripura	-	7.24	8.01

Fig: CFLD on Blackgram

Fig: CFLD on Lentil

D. Nutri-sensitive Agricultural Research Innovation (NARI) not updated the information NARI Updated information

NARI, which stands for Nutrient Awareness and Refinement Initiative, aims to raise awareness about nutrient-sensitive agriculture. This initiative involves Subject Matter Specialists of different KVKs, reaching out to farm women and rural youth. The goal is to encourage them to cultivate nutrient-rich crops in household kitchen gardens. KVKs have undertaken various training, capacity-building, and awareness programs under NARI. These activities include promoting food fortification by incorporating cereal crops and vegetables, demonstrating the development of nutritional gardens in households, and teaching the preparation of organic manure, compost from kitchen waste, and biopesticides (Table 7.6.1).

NARI is a nutrition centric initiative initiated by ICAR (Indian Council of Agricultural Research)

with the aim of improving the health and nutrition of rural communities. In line with this initiative, ICAR-ATARI Zone VII, through its 32 KVKs, has conducted a total of 66 demonstrations on nutritional gardens, showcased bio-fortified crop varieties, and emphasized value addition. These efforts have benefitted 2760 farmers. Furthermore, 146 training programs have been conducted, benefiting 2,538 farmers, and 131 extension activities have reached out to 2,438 farmers during the year 2023-24.

Table 7.7: Status of NARI during 2023

Sl. No	State	KVK	No. of Nutritional Village	Activities (OFT/FLD)		Training Activities		Extension Activities	
				No. Of OFT/ FLD	No. Of Farmers benefitted	No, of Training	No. of Farmers benefitted	No. of Extension Activities	No. Of Farmers Benefitted
1	Manipur	4	9	11	255	14	336	14	248
2	Meghalaya	7	7	16	733	59	832	33	650
3	Mizoram	6	2	15	564	28	515	38	491
4	Nagaland	10	7	12	617	30	568	29	502
5	Tripura	5	6	12	591	15	287	17	547
	Total	**32**	**31**	**66**	**2760**	**146**	**2538**	**131**	**2438**

E. Outscaling of Natural Farming

Out scaling of Natural Farming

Natural Farming is a chemical-free alias for traditional farming methods. It is considered an agro ecology-based diversified farming system that integrates crops, trees, and livestock with functional biodiversity. In India, Natural farming is promoted as the Bhartiya Prakritik Krishi Paddhati Programme (BPKP) under a centrally sponsored scheme- Paramparagat Krishi Vikas Yojana (PKVY). BPKP is aimed at promoting traditional indigenous practices which reduces

externally purchased inputs. It is largely based on on-farm biomass recycling with major stress on biomass mulching, use of on-farm cow dung-urine formulations, periodic soil aeration, and exclusion of all synthetic chemical inputs. According to HLPE Report, natural farming will reduce dependency on purchased inputs and will help to ease smallholder farmers from the credit burden. Several studies have reported the effectiveness of natural farming- BPKP in terms of increase in production, sustainability, saving of water use, improvement in soil health and farmland ecosystem. It is considered a cost-effective farming practice with scope for raising employment and rural development. NITI Aayog along with the Ministry of Agriculture & Farmers Welfare had convened several high-level discussions with global experts on Natural farming practices. It is roughly estimated that around 2.5 million farmers in India are already practicing regenerative agriculture. In the next 5 years, it is expected to reach 20 lakh hectares- in any form of organic farming, including natural farming, of which 12 lakh hectares are under BPKP.

Poster Campaign under Natural Farming

Natural Farming at the KVK level

At present, there are 25 KVKs from the 5 states of ATARI, Zone-VII who are engaged in popularizing natural farming. A total of 176 awareness programmes were conducted benefitting 9677 farmers while 133 Training Programmes were conducted benefitting 4297 farmers. About 204 demonstrations were organized at farms and 1810 farmers attended the demonstrations and gained hands-on experience in natural farming. The progress of the farming system in the Zone is as per table 7.8.1

Table 7.8: Sate-wise activities conducted by KVKs under Natural farming during 2023-24

State	No. of demonstrations conducted	No. of Participants	No. of Training Programmes	No. of Participants	No. of Awareness Programmes	No. of Participants
Manipur	21	200	12	411	18	835
Meghalaya	16	160	13	198	47	1803
Mizoram	44	380	41	1995	44	2446
Nagaland	65	560	37	1003	32	2251
Tripura	58	510	30	690	35	2342
Total	204	1810	133	4297	176	9677

A. Special Programmes

E. Agri-drone Project updated information

This project is being carried out under ATARI, Zone-VII, in six KVKs (Imphal East, Bishnupur, East Khasi Hills, Kohima, Khowai, and Aizawl), two ICAR institutes (ICAR Research Complex for NEH Region and ICAR-NRC on Mithun, Medziphema, Nagaland), and Central Agricultural University, Imphal, Manipur. The projects were approved for implementation in the year 2022–2023.

Achievements under Agri-drone Project

Under the project, a total of 10drones were procured, 12 pilots were trained and 424 demonstrations were carried out covering an area of 624.8 ha to date.

The various operations carried out were micro-nutrient spray, irrigation, nano urea application, insecticides, and fungicides spray covering the crops lettuce, citrus fruits, dragon fruit, potatoes, peas, soybeans, rapeseed, and mustard. The detailed report for the Kisan drone demonstration in different Project Implementing Centres (PIC) under the zone is provided in the Table below.

Table 7.9: Report for Kisan Drone Demonstration in different Project Implementing Centre under ATARI, Zone VII.

Name on the Project Implementing Centre (PIC)	No. of Kisan Drones Purchased by the PIC	No. of persons trained as drone pilot	No. of Kisan Drone Demonstration organized	The Operation carried out (Pesticide/ Nutrient application)	Area Covered under the Kisan Drone Demonstration (Ha)	Number of farmers participated
KVK Imphal East	1	1	14	Nutrient application	14	14
KVK Kohima	1	1	61	Spraying of micronutrient, Neem oil & irrigation	227	1109
KVK East Khasi Hills	1	1	69	Nutrient Spray, Irrigation, Insecticides	84.8	757
KVK Khowai	1	1	250	Micro Nutrient, Insecticides, Fungicides, Nano Urea	273	3546
KVK Aizawl	1	1	12	Nutrient, Jivamrit (NF), Neemastra, IIHR micro Nutrient Vegetable special.	11	572
KVK Bishnupur	1	1	10	Micro nutrient and Nano urea	10	150
DEE, CAU, Imphal	2	2	Nil	Nil	Nil	Nil
ICAR-NRC Mithun	1	2	Nil	Nil	Nil	Nil
ICAR Research Complex For NEH Region	1	2	8	Nutrient/ Irrigation	5	334
TOTAL	**10**	**12**	**424**		**624.8**	**6482**

Table 7.10: ASCI Skill Training programme 2023

S. No.	Zone	State	KVK	Name of QP/Job role	Duration (hrs)	No. of courses organised	No. of participants						Total
						KVKs	SCs/STs		Others		Total		
							Male	Female	Male	Female	Male	Female	
1	ATARI Zone VII	Manipur	KVK Thoubal	Mushroom producer	240 hrs	1	10	25	4	1	14	26	40
		Meghalaya	KVK West Garo Hills	Organic farmer	240 hrs	1	32	5	3	0	35	5	40
		Mizoram	KVK Kolasib	Mushroom producer	240 hrs	1	6	25	4	5	10	30	40
		Nagaland	KVK Wokha	Mushroom producer	240 hrs	1	22	13	1	4	23	17	40
		Tripura	KVK North Tripura	Beekeeping	240 hrs	1	20	8	8	4	28	12	40
		Total					**80**	**76**	**20**	**14**	**110**	**90**	**200**

The table provides an overview of the skill training programmes conducted under Recognition of Prior Learning (RPL) in five states—Manipur, Meghalaya, Mizoram, Nagaland, and Tripura. For the first time, the Recognition of Prior Learning (RPL) program was conducted during 2023, and ASCI Skill training programme aims to recognize and certify the skills, knowledge, and experience of farmers acquired through informal learning and practical experiences. Under ICAR- Zone VII, the RPL program was implemented to upskill 200 farmers with each state having 40 trainees.

In Manipur, a total of 14 men and 26 women were trained in mushroom production, Meghalaya a total of 35 men and 5 women were trained in organic farming; in Mizoram, a total of 10 men and 30 women were trained at mushroom production, in Nagaland a total of 23 men and 17 women were trained on mushroom production and in Tripura, a total of 28 men and 12 women were trained on Beekeeping. Overall, 110 men and 90 women were trained under the RPL program.

Training on spawn production by KVK Wokha

Skill training on mushroom production by KVK Kolasib

Skill training on organic farming by KVK West Garo Hills

KVK Thoubal trains on spawning, cropping and management of optimum conditions in cropping and spawning room for mushroom cultivation

Skill training on beekeeping by KVK North Tripura

F. TSP (Tribal Sub Plan)

Under ICAR-ATARI Zone VII, there are 27 TSP KVKs, that have been undertaking various technological interventions including training, demonstrations, extension activities, production of quality seeds and planting materials, input supply, advisory services, soil testing and SHCs distribution, post-harvest management, etc. besides various special programs for socio-economic development and sustainable livelihood security of tribal farmers since 2014-15. A total of 643 demonstrations/ trainings were conducted benefitting 1978 farmers, 209 women farmer trainings were conducted benefitting 5103 individual women farmers, 246 trainings for rural youth conducted, benefitting 4724 youths. 1324 participants were involved in extension activities. About 1110 quintals of seed, 9.5 lakh Planting materials, 1.08 lakh livestock strains, and 2.09 lakh fingerlings were produced during the financial year. A total of 5501 samples of soil, water, plant, and manure were collected during the reporting year 2023-24.

Demonstration on IFS under TSP (KVK West Tripura)

Critical inputs under TSP at Yanthamo village (KVK Wokha)

G. District Agro-Met Unit (DAMU)

Under ICAR-ATARI Zone-VII, the project was initially implemented in 7 KVKs namely; Chandel, West Garo Hills, West Khasi Hills, Mokokchung, Mamit, Dhalai, and Kiphire, however, during 2023, only six KVKs under the zone implemented the project as KVK West Garo Hills had to discontinue the scheme due to shortage of manpower.

Achievements under DAMU KVKs for 2023

During the year 2023-24, about 56 awareness programmes were conducted under the project by DAMU KVKs benefitting 2232 farmers in the region. A total of 1785 agro-advisories were given to 37585 farmers and these advisories were disseminated through mkisan, Kisan Sarathi portal, All India Radio, emails, Meghdoot Mobile App, Local Daily Newspapers, and through social media platforms like Facebook and Whatsapp group. A total of 15 farmer-scientist interactions were also conducted by the KVKs of ICAT-ATARI Zone VII , covering 682 farmers.

Table 7.11: Achievements under DAMU scheme during 2023-24

Name of the KVK	Farmer awareness programe		Agro advisory services		Farmer-scientist interaction	
	No. of activities	No. of farmers	No. of activities	No. of farmers	No. of activities	No. of farmers
Chandel	2	417	-	-	2	118
Kiphire	16	572	265	5113	5	274
West Khasi Hills	18	480	871	4604	1	30
Mamit	4	310	230	3190	1	30
Mokokchung	7	197	219	4578	2	50
Dhalai	9	256	200	20100	4	180
TOTAL	**56**	**2232**	**1785**	**37585**	**15**	**682**

Awareness programme conducted on Agro-advisory services at KVK Kiphire

H. Rainwater Harvesting Structure

During 2023, most of the KVKs of the zone conducted several activities related to rainwater harvesting and its management including training, demonstration, and other extension activities like field visits, farmer-scientist interactions, etc. for enhancing knowledge and skills of farmers on construction and use of rainwater harvesting structures. Concerted efforts were put on awareness programmes on rainwater harvesting for timely utilization during the lean season in fields.

Rainwater Harvesting under KVK Lawngtlai District

During the reporting period, as many as 38 training programmes and 50 demonstrations were conducted, and a total of 1265 farmers visited the KVKs for the said purpose, and 234 visits were made by the KVK scientists to the farmers' fields to guide the efficient construction and use of structures (Table).

Table 7.12: Achievement of rainwater harvesting structures during 2023

State	No. of Training Programme	No. of Demonstration	No. of Planting Materials Produced	Visit by Farmers	Visit by KVK Staff
Manipur	14	23	30058	135	48
Meghalaya	7	6	300	230	19
Mizoram	3	7	26470	500	98
Nagaland	7	10	252	123	34
Tripura	7	4	500	277	35
Grand Total	**38**	**50**	**57580**	**1265**	**234**

I. Mera Gaon Mera Gaurav (MGMG)

An innovative initiative "Mera Gaon Mera Gaurav" has been planned to promote the direct interface of scientists with the farmers to hasten the lab-to-land process. The objective of this scheme is to provide farmers with the required information, knowledge, and advisories regularly by adopting villages. During 2023, 144 villages were covered under MGMG which benefited SC/ST 3385 and others 494 farmers. Various activities like training, demonstrations, awareness programmes, technology handouts, and identifying problems at village levels were conducted and assisted by the KVKs to the farmer and farm women **(Table. 7.14.1)**

Table 7.13: Achievements under Mera Gaon Mera Gaurav (MGMG) during 2023

KVKs	No of Villages	Participants		No of Visit made	Participants		No of demonstration	Participants		No of Farmers meeting	Participants	
		SC/ST	Others		SC/ ST	Others		SC/ST	Others		SC/ST	Others
Manipur	26	228	462	50	85	422	44	45	199	16	140	176
Meghalaya	67	1067	0	82	375	0	63	445	0	110	850	0
Mizoram	14	909	0	75	772	0	32	185	0	47	840	0
Nagaland	31	1064	0	67	1710	0	18	160	0	19	386	0
Tripura	6	117	32	11	85	21	28	36	4	2	21	7
TOTAL	**144**	**3385**	**494**	**285**	**3027**	**443**	**185**	**871**	**203**	**194**	**2237**	**183**

Soil, Water, and Plant Analysis

Along with their mandated activities, the KVKs under Zone-VII during 2023 rendered special assistance to the farmers in terms of laboratory-based analysis of soil, water, and plant samples to recommend balanced fertilizers in soil, water, and plant health improvement. During the period under report, the KVKs analyzed a total of 6629 samples comprising soil samples (5665), water samples (892), and plant samples (72). In the process, a total of 439 villages had been covered and as many as 9159 farmers were benefitted. The state-wise details of Soil, Water, and Plant samples analysis are given in Table.

Table 7.14: State-wise soil, water, and plant samples analysis carried out by KVKs during 2023

State	Samples tested/ Analysed	Nos.	Farmer beneficiaries	Village covered
Manipur	Soil Sample	1214	2306	119
	Water Sample	468	383	58
	Plant Sample	18	15	10
Meghalaya	Soil Sample	560	560	48
	Water Sample	85	85	17
	Plant Sample	0	0	0
Mizoram	Soil Sample	2021	2541	54
	Water Sample	105	71	9
	Plant Sample	0	0	0
Nagaland	Soil Sample	981	2075	53
	Water Sample	0	0	0
	Plant Sample	0	0	0
Tripura	Soil Sample	889	889	46
	Water Sample	234	234	25
	Plant Sample	54	0	0
Total	**Soil Sample**	**5665**	**8371**	**320**
	Water Sample	**892**	**773**	**109**
	Plant Sample	**72**	**15**	**10**
Grand Total		**6629**	**9159**	**439**

Table 7.15: Status of soil, water, and plant samples analyzed by the KVKs during 2023

Status of Soil, Water & plant samples analysed by the KVKs of ATARI, Zone-VII				
Sl. No	**Samples Tested/Analysed**	**No**	**Farmer Beneficiary**	**Village covered**
1	Soil Sample	5665	8371	320
2	Water Sample	892	773	109
3	Plant Sample	72	15	10
Total		**6629**	**9159**	**439**

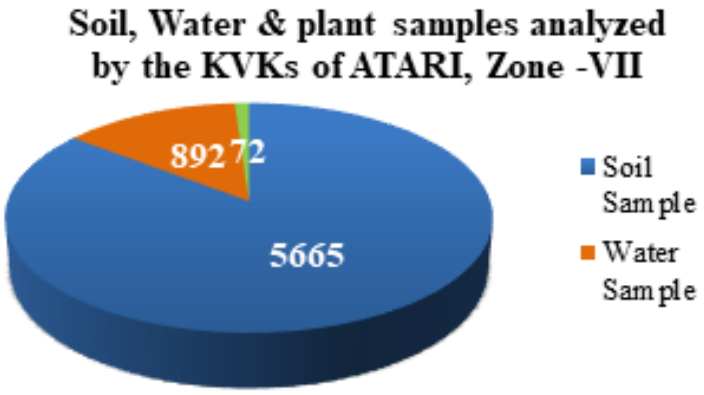

Fig: Status of Soil, Water & plant samples analyzed by the KVKs of ATARI, Zone-VII

Soil Health Cards (SHCs)

Under the scheme, the government plans to issue soil health cards to farmers which will carry crop-wise recommendations of nutrients and fertilizers required for the individual farms to help farmers improve productivity through judicious use of inputs. KVKs in Zone VII tested soil samples in various soil testing labs including Mridaparikshak and analyzed the strengths and weaknesses (micro-nutrient deficiency) of the soil and suggested measures to deal with them. The results and suggestions are displayed on the soil health cards. As many as 8120 numbers of soil health cards were distributed to 8371 farmers on different occasions and farmers' programmes were organized by KVKs in the zone.

Observation of World Soil Day

Table 7.16: State-wise details of Soil Health Cards (SHCs) distributed to the farmers during 2023

SL. No	State	No. of SHCs Distributed	No. of Farmers' Benefitted
1	Manipur	2246	2306
2	Meghalaya	221	560
3	Mizoram	2694	2541
4	Nagaland	2070	2075
5	Tripura	889	889
TOTAL		**8120**	**8371**

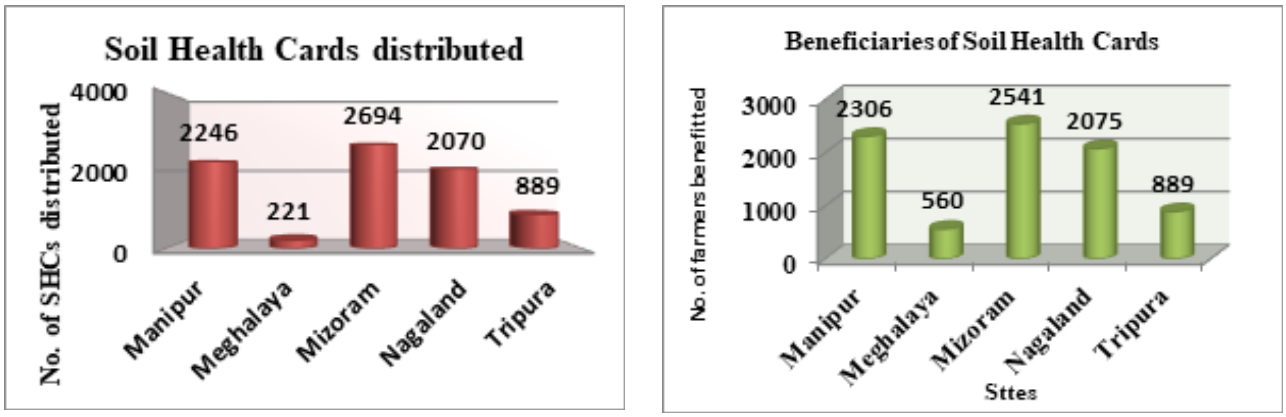

Fig : State-wise details of a) Soil Health Cards (SHCs) distributed and b). beneficiaries of SHCs

Kisan Mobile Advisory Services rendered by KVKs

During 2023, KVKs rendered Kisan Mobile Advisory Services in connection with the transfer of technologies by providing information, advice, solutions, and suggestions to various problems related to agriculture and allied activities as well as a collection of feedback from the farmers for further assessment and refinement for generating location-specific technologies. It is seen from the Table that as many as 31607 messages had been sent benefiting 265815 farmers in remote districts under the Zone. The mobile advisories include thematic areas like crops (12313), livestock (5897), weather (3105), marketing (1162), awareness generation (4895), and other enterprises (4235) during 2023

Table 7.17: Kisan Mobile Advisory Services (KMAS) rendered by KVKs during 2023

Mobile Advisory Services rendered by KVKs during 2023														
Message type	Crop		Livestock		Weather		Marketing		Awareness		Other Ent.		Total	
	M	B	M	B	M	B	M	B	M	B	M	B	M	B
Text only	4614	48942	1941	39844	1405	47426	395	12646	1398	34551	1293	35422	10469	165422
Voice only	4553	7479	2115	4171	433	3945	431	801	1264	2700	1390	2525	9476	21169
Voice and Text both	3146	6022	1841	4701	1267	1151	336	2978	2233	5589	1552	4922	10017	24914
Total	**12313**	**62443**	**5897**	**48716**	**3105**	**52522**	**1162**	**16425**	**4895**	**42840**	**4235**	**42869**	**29962**	**211505**

Scientific Advisory Committee (SAC) Meetings

In 2023, a total of 43 Scientific Advisory Committee (SAC) meetings were conducted by the KVKs under Zone VII. The Scientific Advisory Committee is an institutional arrangement to provide a platform for the committee members to conduct a comprehensive review of the activities undertaken by the respective KVKs during the specific period. Besides, the members discussed and finalized the region-specific action plans for the upcoming year, keeping regional diversity in mind.

These meetings were attended by members representing various line departments, input agencies, farmer representatives' financial institutions, and media persons from the respective districts where they provided their valuable insights and suggestions for improvement and effective functioning of the KVKs in their respective areas.

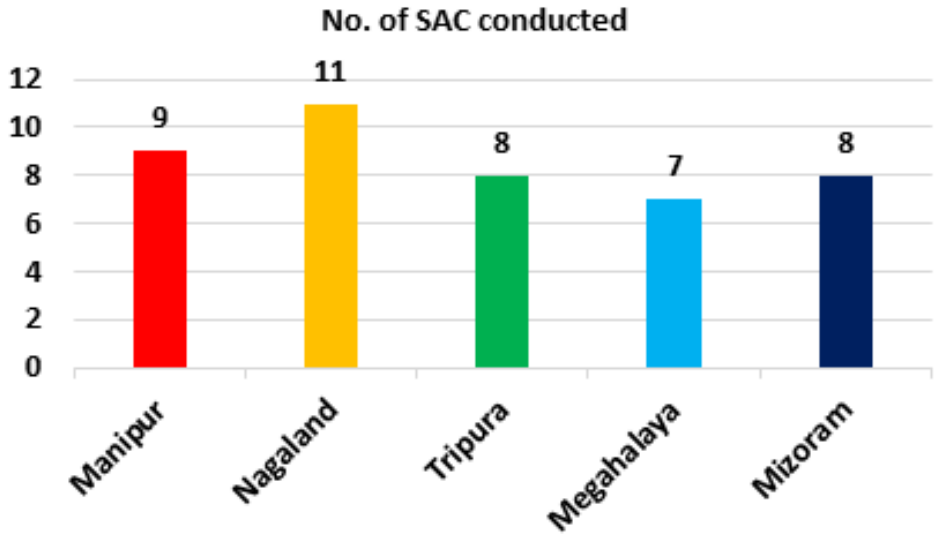

Fig 6: Scientific Advisory Committee (SAC) meetings conducted by KVKs of ATARI, Umiam during 2023

8 Agricultural Technology Information Centre (ATIC) and Technological Backstopping by DEEs updated information 2023

The Agricultural Technology Information Centre provides information on agriculture technologies in addition to providing other inputs like seeds, plant materials, etc., including advisory services through a single window system. The ATIC is intended to provide a formal management mechanism between the scientists and technology users

The ATIC at ICAR Research Complex for NEH Region, Barapani was sanctioned in 1999 by the Indian Council of Agricultural Research. The rationale for the establishment of ATIC were-

- To provide diagnostic services for soil and water testing, plant and livestock health
- To supply research products such as seeds and other planting materials, poultry strains, livestock breeds, fish seeds, processed products etc. emerging from the institution for testing and adaptation by various clientele
- Providing information through published literature and communication materials as well as audio-visual aids
- Providing an opportunity for the institution/ SAU to generate some resources through the sale of their technologies.

Salient Achievements of ATIC, ICAR Research Complex for NEH Region, Umiam during 2023

- A total of 21 farmers visited the ATIC for technology information related to the production and management of various crops and livestock enterprises.
- A total of 45 copies of books and technical bulletins and 106 folders were sold, which could generate revenue of Rs.11,810

Technology Backstopping by DEE

The responsibility of technology backstopping, capacity building, monitoring, and review of activities of KVKs is vested with the directorate of extension of state agricultural universities of the zone and with ATARI. The Directorate of Extension Education and its officials coordinate and monitor the mandated activities of all the KVKs under their jurisdiction through Scientific Advisory Committee meetings, workshops, review meetings, field visits, and organize HRD for KVK staff on frontier areas of technologies. Further, they also provide technological products like improved seeds, planting materials, livestock, poultry breeds, and fingerlings to various KVKs as per their farmer's requirements. The Directorate of Extension Education of CAU Imphal and its officials participated in 10 Scientific Advisory Committee Meetings. Similarly, they have attended 12 field days, 6 workshops/seminars, 10 technological weeks, 5 training programs, 71 On-Farm Trails and 75 Frontline Demonstrations organized by the KVKs of ATARI Zone VII. The detailed activities conducted by DEE are presented in Table 7.1.

Table 8.1: Activities by Directorates of Extension Education

Sl. No	Particulars	DEE
1	No of Visits by DEE to KVKs	10
2	No of visits of other scientists to KVKs	5
3	No of Review meetings held	3
4	Any other monitoring and review meeting held	2
5	HRD Programme conducted for knowledge empowerment and technology backstopping to the KVKs a) No of programme b) No of participants	 2 53
6	Other Extension Activities conducted for knowledge empowerment and technology backstopping to the KVKs (SMS) North East India's Farmers & Students conclave: Igniting Agri Revolution connecting Agri-preneurs to circular economy. a) No of programme b) No of participants	 1 2332
7	Technology inventory developed(No)	-
8	Other publications, bulletins, CDs etc. brought out (No)	
9	Farm magazine	1
10	Kishan diary	1
11	Books (including proceedings of workshops)	1
12	Training Manuals	3
13	Calendar	1
14	CAU Calendar	1
15	Souvenir	1
16	Folder	6

9 Publications updated information

Technical/ Extension Bulletin

A.K.Singha, Amrutha, T (2022). Climate Smart Practices and Technologies in NICRA Annual Report 2020-21. © 2022, ICAR- Agricultural Technology Application Research Institute, Umiam, 70.

Rajumoni Bordoloi, A.K. Singha, Amrutha T, Mesaya Rangsa Marak, Sarah Wahlang, Fenestella Dkhar, (2022). Success stories under the project Attracting and Retaining Youth in Agriculture (ARYA). ICAR-ATARI, Umiam, Meghalaya, 64.

Research Paper

Biam K P, Singh N U, Gowda C H R, Tripathi A K, Paul P, Amrutha T & Dkhar H (2022) Pulses Production In North East India: Trend And Decomposition Analysis. Indian Journal Of Hill Farming. Special Issue 35: 135-141 DOI: 10.56678/iahf-spl2022.16

Book chapters/ Technical bulletin/ Manual/ E-Learning Lesson

Amrutha T., Chikkathimme Gowda H. R, A.K. Mohanty, A.K. Singha, R. Bordoloi, Subrata Das, Ravi S.C, Village social accounting matrix (SAM): An impact assessment tool to study the effect of programme/ Policy interventions on village economy dynamics. PME publication No. Mod/AZ7/01/ 2023. ICAR-ATARI, Zone-VII, Umiam-793103.

Publications by the KVKs

Table: Publications by the KVKs of ATARI Zone VII during 2023

Sl. No	No. of KVKs	Category of Publication	Numbers
1	2	Abstract	9
2	9	Book Chapters	23
3	5	Book Published	5
4	1	CD/DVD/ YT Videos	1
5	1	Extension Folder	1
6	1	Lead Paper	1
7	12	Leaflets/Pamphlet/Extension literature	104
8	4	News coverage	7
9	10	Popular Article	48
10	13	Research Paper	43
11	2	Technical Bulletin	10
12	4	Training Manual	8
13	8	Others	17
		Grand Total	**276**

10 Awards and recognitions received by KVKs and Farmers during 2023

KVKs and their dedicated staff members have received numerous awards and recognition for their remarkable contribution in various fields including agriculture, research, extension, and innovations. These honors span a wide range of categories and are conferred by prestigious professional societies, government bodies, and organizations, acknowledging their outstanding efforts and achievements in their respective domains. Their dedication and excellence continue to make a significant impact in the agricultural and rural development sectors. These achievements and awards are presented in the following table

Table: Awards and recognitions received by KVKs of ICAR-ATARI, Zone-VII

Sl. No	Name of Award/ recognition/ fellowship	Professional Society/ Govt./ ICAR/ Any other agency (pl. specify)	Value of award (Rs)	Salient Contribution/ Achievement
KVK Bishnupur, Manipur				
1	District Millionaire Farmer of India Award 2023	Organised by Krishi Jagran and sponsored by Mahindra Tractors	Momento and Certificate	High-income generation Viz. 15,0,000 by cultivating horticultural crops
KVK Imphal West, Manipur				
2	1st position on Agri-Horti Expo 2023	MOMA & MOVCDNER Dept of Agriculture & Horticulture, Manipur	50000	Technology showcasing
3	1st position on Agri fair, Natural farming	CAU, Imphal	50000	Technology showcasing
KVK Thoubal, Manipur				
4	Certificate of Commendation for exemplary service	Deputy Commissioner Thoubal	Nil	Skill Training/ Vocational Training to be inmates of Relief Campus opened by District Adm. Thoubal due to the violence of 3rd May, 2023
5	First Best Oral Presentation	ABI Centre & ZTMC, ICAR-Research Complex for NEH Region, Umiam, Meghalaya	Nil	Ascertaining Farmers livelihood through different Extension approaches: An exploratory study under Thoubal District, Manipur

6	First Best Oral Presentation in International Conference on Natural Farming for Revitalizing Environment and Resilient Agriculture	College of Agriculture, Iroishemba, Imphal	Nil	Ascertaining the factors influencing the adoption of Organic Farming in KVK District.
KVK Jaintia Hills Meghalaya				
7	Millionaire Farmer of India Award, 2023	Krishi Jagran	Nil	Piggery and Poultry Farming, Breeding of pigs, and Supply of Poultry feed
8	National Cooperative Development Corporation Regional Awards for Cooperative Excellence and Merit, 2023	National Cooperative Development Corporation	Nil	Piggery and Poultry Farming
KVK South Garo Hills Meghalaya				
9	Dr.Athokpam Haribhushan, Senior Scientist & Head, KVK South Garo Hills, Meghalaya received a recognition/ appreciation award for bringing funds from an external source during the celebration of 20th CCS Foundation Day on 4.10.2023 organized by College of Community Science, Tura.	College of Community Science, Tura.	Nil	Award received for contribution in the field of Agricultural Science & Allied activities
10	KVK South Garo Hills received a consolation prize in the Vegetable show at the CAU-Regional Agri Fair 2023-2024 held from 12th to 14th December 2023 at Dimapur, Nagaland.	Dimapur, Nagaland.	1000	Award received for contribution to the production of local vegetables in the district
KVK West Khasi Hills Meghalaya				
11	Best KVK Professional Award	SEEA Agra	Nil	Research & Development
12	NABARD Special Award	NABARD	Nil	For the successful implementation of Springshed based watershed development project
KVK Champai Mizoram				
13	Cleanliness Week Competition	Khawzawl District Sanitation Task Force	5000	Cleanliness Week Competition

KVK Kolasib Mizoram				
14	Best KVK Scientist Award	5th International Conference on Global Insights on Research and Development in Agriculture, Horticulture and Allied Sciences, G.H. Raisoni University, Madya Pradesh		
15	Outstanding Achievement Award	Indian Society of Agriculture and Horticulture Research Development, Chandigarh	Nil	
KVK Mamit, Mizoram				
16	Third prize (Cleanliness)	Village Council, Lengpui	Nil	Cleanliness competition of Department Offices
KVK Serchhip, Mizoram				
17	Third best presentation Award on 1st National Seminar organized (Online) on 27th – 28th October, 2023.	Society of Krishi Vigyan	Certificate	'Work on Chilung technology, sustainable approach for Mithun farming in Serchhip District, Mizoram.'
KVK Dimapur, Nagaland				
18	Millionaire Farmer of India Award	Krishi Jagran	Nil	Horti-based integrated farming system
KVK Wokha, Nagaland				
19	Millionaire Award		Nil	Round the year organic tomato cultivation under protected cultivation
KVK Zunheboto, Nagaland				
20	KVK Scientist Award (Mr. Wapangtoshi Longkumer)	Dr. Ram Avatar Shiksha Samiti (DRASS)	Nil	Excellent contribution in the field of Agriculture and allied sector
21	Distinguished Scientist award (Dr. Rakesh Kumar Chaurasia)	Society for recent development in agriculture	Nil	Outstanding contribution in the field of LPM
KVK Khowai, Tripura				
22	Institutional Certificate of Appreciation- Secured 2nd position in the event of Exhibition Stall during 1st Fish Farmers Science Congress and 23rd National Fish Farmers Day Celebration	College of Fisheries, Lembuchera, Tripura	Nil	Exhibition Stall

23	Institutional Certificate of Appreciation for successfully conducting READY programme of B.F.Sc. Final year students (13 nos.) for 30 days	College of Fisheries, Lembuchera, Tripura	Nil	READY programme
24	Best Oral Paper Presentation Award to SMS- Soil Science	National Seminar on Climate Resilient Millet Production Technologies for Sustainable Agriculture (CRMPTSA- 2023)	Nil	Climate Resilient Millet Production Technologies
25	FELLOW (FESI) to SMS- Plant Protection	Entomological Society of India, ICAR-IARI, New Delhi	Nil	Entomological Research
26	Young Scientist Award to SMS-Horticulture	by UBKV, Cooch Behar	Nil	Vegetable Research
27	Young Scientist Associate Award to SMS-Agril Extension	Society for Recent Development in Agriculture, UP	Nil	Farmer's Club
KVK West Tripura, Tripura				
28	Best Extension Professional Award to Dr. Mandira Chakraborti	Society for Biotic and Environmental Research during Biotic Science Congress (BioScan, 23) December 7-8 2023	Nil	Commendable contribution to the field of Agronomy
29	SAAI-KrishakBandhu Award 23 (Dr. Mandira Chakraborti)	Society for Advancement of Agricultural Innovations (SAAI) on 28th April 2023	Nil	Outstanding contribution in the field of Agronomy
30	Second best stall award during the celebration of 23rd fish farmers' Day on 11/7/2023 (Team Award)	College of Fisheries, Lembucherra, CAU.	Nil	Showcasing on different improved technologies
31	Recognition received for contribution in the ICAR-GKMS services	ICAR-GKMS Unit	Nil	Providing advisories to the farmers based on weather parameters.

Awards and recognitions received by Farmers of KVKs ICAR-ATARI, Zone-VII

In Manipur's Thoubal district, an impressive achievement was made by Mr S. Robinson Singh (2nd position) during "Fish Farmers Science Congress, 23rd National Fish Farmers' Day" hosted by College of Fisheries (CAU, Imphal), Lembucherra, Tripura, India. In Ukhrul, Mr. A. K. Deben was honored with the District Millionaire Farmer of India Award 2023. A progressive farmer from East Khasi Hills, Meghalaya also achieved success at the Millionaire Farmer event. In Mizoram's Lawngtlai district, awards were presented to Mr. Lalnunzira as the Best Innovative Farmer, Mr. Lalbiakdika as the District level Farmer,

KVK Khowai Farmer's award received from state A & FW Minister

Mr. Lalbiakdika as the Best Horticulture award, and Mr. Joshua as the Best Farmer Award. Additionally, Hrangmawia from Saiha, Mizoram, received an award from MFOI. In the Phek district of Nagaland, awards were given to Mrs Vezokholu at the National Millionaire Farmer of India Award 2023, Mrs. Kuhukhrulu Khamo at the District Millionaire Farmer of India Award 2023, and Mr. Venieo Vadeo at IARI Innovative Farmer Award. These individuals have demonstrated exceptional dedication and innovation in their fields, making significant contributions to agriculture and farming in their regions.

Table: Awards and recognitions received by Farmers of KVKs ICAR-ATARI, Zone-VII

Sl. No	Name of Award/ recognition/ fellowship	Professional Society/ Govt./ ICAR/ Any other agency (pl. specify)	Value of award (Rs. In lakh)	Salient Contribution/ achievement
KVK Thoubal, Manipur				
1	Sambamduram Robinson Singh, 2nd Position Session during 1st Fish Farmers Science Congress, 23rd National Fish Farmers' Day	College of Fisheries (CAU, Imphal), Lembucherra, Tripura, India	Rs. 4000/-	Seed production Magur
KVK Ukhrul, Manipur				
2	AK. Deben Singh awarded District Millionaire Farmer of India Award, 2023	Mahindra Tractors		The farmer is associated with training. FLD on system of Rice Intensification, cultivation of maize, IFS based on Rice + Fish + vegetables crops in poly house, cultivation of black turmeric under organic farming, cultivation of rapeseed & mustard under zero tillage condition etc. Developed a new Power tiller mounted furrow maker.
KVK East Khasi Hills, Meghalaya				
3	MFOI Award to Progressive Farmer	MFOI	Nil	Millionaire Farmer
KVK Lawngtlai Mizoram				
4	Best Innovative Farmer Award (NICRA) toMr. Lalnunzira	CRIDA- ICAR, Hyderabad	Certificate etc	Use of Farm machinery, Irrigation system, Crop production etc

5	District-level farmers award toMr. Lalbiakdika	ATMA, Mizoram	Certificate + Rs. 20,000/-	Horticulture crops + Mango + Mango bar
6	Best Horticulture Award toMr. Lalmuansanga)	Horticulture, Mizoram	Certificate + Rs 50000	Off-season watermelon & Tomato production
7	Best Farmer Award toMr. Joshua	ATMA, Mizoram	Certificate + Rs. 30,000/-	Potato, Cabbage, Tomato, Broccoli etc
KVK Saiha, Mizoram				
8	Hrangmawia	MFOI	Nil	Mithun and goat rearing.
KVK Phek, Nagaland				
9	Mrs Vezokholu Chuzho/ National Millionaire Farmer of India Award 2023	Krishi Jagran, New Delhi	Nil	High-value fruit crops-Kiwi, Persimmon, medicinal plants, Piggery unit and Poultry
10	Mrs Kuhukhrulu Khamo/ District Millionaire Farmer of India Award 2023	Krishi Jagran, New Delhi	Nil	Field crops, Piggery unit, Poultry and Floriculture
11	Mr. Venieo Vadeo IARI Innovative Farmer Award - 2024	IARI, New Delhi	Nil	Grass Cutter cum Tiller (Modified)

11 Success Stories

1. Venturing towards Sorghum (Millet) cultivation in uncultivable land for enhancing farm income

Introduction

Smt Ningthoukhongjam Sanamacha Devi W/O Shri N. Hogen Meitei, a women farmer, age 48 years old from Keirak, Kakching, Manipur has been cultivating various seasonal crops in her 0.87 ha land with the help of her husband. She has been cultivating rice, mustard, cabbage, Potato, etc in her field during Kharif and Rabi seasons. She cultivates landrace varieties of potato var. Aberchaibi, Pea var. Makhyatmubi and landraces sorghum varieties apart from numerous improved varieties of crops. During Kharif, 2022, a year ahead of the International Year of Millet, KVK, Thoubal, Dept. of Agriculture, Govt. of Manipur intervened and gave awareness about the millets to her. She took a keen interest in cultivating millet especially sorghum which she has been cultivating for her home consumption in negligible areas between the areas of the main crop. On Kharif, 2022, with the help of a Subject Matter Specialist (Plant Breeding & Genetics) from KVK, Thoubal started scientific cultivation of the sorghum (landraces) and expanded her areas of sorghum to 0.25 ha instead in the areas where other crops need intensive care due to low fertility and poor irrigation facility. She was also given hands-on- training about the preparation of various values added products of sorghum and other millets by Subject Matter Specialist (Home Science), KVK, Thoubal. With the knowledge acquired from the experts, the yields of the sorghum have been increased and she made various value-added products of sorghum.

KVK Intervention

Status before Intervention: She was a mere woman farmer without many earnings from his agricultural activities. Like her fellow farmers, she places the main emphasis on cultivating rice only in areas of erratic rain and poor irrigation facilities. The area where she has been cultivating rice did not give satisfactory yield because of a lack of irrigation facility and the current scenario of rainfall. Although she cultivated millet (Sorghum) in her negligible areas before intervention, had little knowledge about the health benefits of millets and adaptability of millets.

After intervention: Seeing her enthusiasm for cultivating millet, the experts from KVK, Thoubal, Dept. of Agriculture, Government, Manipur conducted a training program on cultivation & value-added products of millet in her locality in which she participated in the training program. From the training, she came to know the nutritive value of millet and the scientific cultivation of millets and cultivated sorghum (landraces). She was also given insightful knowledge of millets and the marketing strategy for the millets through an established FPO under KVK, Thoubal. Her husband became a member of the Khana Chaoba Farmer Producer Company Ltd., Kakching established under KVK, Thoubal as POPI and sanctioned by NABARD, Regional Centre, Imphal. Through the FPO value-added products like Sorghum Sweet balls, Sorghum puff balls, and Sorghum cookies were sold which increased her income. The Khana Chaoba Farmer Producer Company Ltd, Kakching participated in one day workshop on millet on 25th January 2023 organised by ICAR, NEH Region, Lamphelpat, Manipur sponsored by NABARD, Regional Centre, Imphal by displaying various value-added products of millet in which the FPO represented by Smt. Ningthoukhongjam Sanamacha Devi received an award.

Smt. NingthoukhongjamSanamacha Devi received an award from one day workshop on millet on 25th January 2023 organized by ICAR, NEH Region, Lamphelpat, Manipur sponsored by NABARD, Regional Centre, Imphal representing KhanaChaoba Farmer Producer Company Ltd., Kakching

Result

From her 0.25 ha of sorghum field, she harvested the grain of about 320 kg and sold it at Rs 80/kg as raw also she made various value-added products of sorghum viz. Sorghum Sweet balls give a gross income of Rs 700/kg @ Rs 10/ piece, Sorghum puff balls give a gross income of Rs 700/kg@ Rs 10/ piece and Sorghum cookies give a gross income of Rs 1500/kg @ Rs 10/ piece. The BC ratio of 2.02 was obtained through value-added products. Her earnings made her an easily maintain livelihood including her children's education

Vigorously growing sorghum at field

Various value-added products of sorghum

Impact

By seeing the success of N. Devi, many women farmers have shown interest in scientific millet cultivation. Women farmers in SHGs and FPOs are involved in the value addition of millet-based products, and these are sold in the nearby market thereby fetching a higher price. Women can earn more income by transforming their products into higher-value goods. This has led to greater financial independence, improved living standards, and increased economic empowerment for women residing in the village

2. Sowing the Seeds of Success: The Grit of a Hardworking Farmer

Introduction

Smt. Angela Shangnoi, 52 years of age and a resident of Mawkynbat village, Nongstoin Block under West Khasi Hills District, Meghalaya is a progressive farmer with a total land holding of about 11.73 hectares. She gained her education up to class 10 and took up agriculture and allied activities as her primary occupation. Before her association with KVK, Angela faced various obstacles that hindered her farming success. Limited access to modern techniques in agriculture, horticulture, veterinary and inadequate knowledge of crop management, and lack of resources were constant hurdles that prevented her from maximizing her agricultural productivity.

Intervention

In the year 2013, Scientists of Krishi Vigyan Kendra, West Khasi Hills visited her and after a thorough review of her existing farming practices introduced her to modern technologies to improve her livelihood. The Technologies comprised of best package of practices, high yielding varieties of crops like broccoli, pea, capsicum, salad, brinjal, radish, tomato, coriander, Zero energy cooling chamber improved breeds of piggery (large black cross), Vanaraja, white Pekin, gramapriya , climate resilient pig pen model.

Equipped with this newfound knowledge and skills, Angela began implementing the techniques she learned from KVK. She saw a significant increase in her production over the years. The following is the effect of the interventions as shown in the table below:

Names of components	Area (Acre)/Number			Production/yield (Q/Liter/No.)			Cost of production (Rs.)			Gross Income (Rs.)			Net Income (Rs.)			B: C ratio		
	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023	2017	2022	2023
Carrot	0.6	1.1	2.47	30 q	88q	200q	40500	74500	179300	70800	160000	440000	30300	85500	260700	1.7	2.1	2.4
Paddy	12.3	12.3	12.3	87.5	92	100	65000	68000	74000	140000	147200	170000	75000	79200	96000	2.1	2.2	2.3
Pea	1	1	2.47	12 q	16.8	47 q	25800	30000	91250	54000	69200	220500	28200	39200	129250	2	2.3	2.4
Capsicum	0.09	0.09	0.12	11	13	18	40000	44000	52000	92000	110500	167000	48000	62500	97000	2.3	3.4	3.2
broccoli	0.098	0.098	0.098	30 q	35q	40 q	23000	26000	30000	125000	159000	182000	102000	133000	129000	5.4	6.1	6
Salad	0.049	0.049	0.098	5 q	6q	14 q	6000	7000	13000	40000	60000	154000	34000	53000	141000	6.6	8.5	11.8
Poultry	50 nos	200 nos		0.75 q	5 q		13200	58500		25000	130000		11800	71500		1.9	2.2	
Piggery	3 nos	4 nos	5 nos	2.1 q	32 piglets	39 piglets	21000	59000	68000	41000	130000	175500	20000	71000	107500	1.8	2.2	2.5

Recognizing her dedication and progress, KVK continued to support her journey. They provided her with ongoing guidance, access to new technologies, and opportunities to participate in advanced training and extension programs. Her association with KVK not only transformed her farming practices but also opened doors to networking and collaboration with other progressive farmers and agricultural experts. As the seasons unfolded, Angela's efforts bore fruit—literally and figuratively. Her fields flourished, teeming with abundance, while her income soared to new heights. With each harvest, Angela's socio-economic status underwent a remarkable transformation. No longer shackled by financial constraints, she found newfound confidence and independence. She was able to provide her children with better education,

healthcare, and opportunities for a brighter future. She invested in her farm, expanding her operations and exploring new avenues for growth. Her once modest homestead blossomed into a thriving enterprise—a testament to the power of determination, resilience, and community support

Impact

Smt. Angela Shangoi, a proud recipient of **KRISHI KARMAN** & **MAHILA KISAN** awards is a hard-working, dedicated farmer who continues to be a source of inspiration and support for her fellow farmers. She actively participates in community initiatives and training programs and is an advocate for the benefits of KVK's interventions. She shares her experiences and encourages fellow farmers to adopt the recommended practices and improved varieties. Angela's passion and firsthand success story served as a powerful motivation for others to follow suit. Angela's dedication to sharing her knowledge and experiences has created a ripple effect in her community. The technologies and practices she implemented on her farm have now been adopted by numerous farmers. Through her leadership and guidance, farmers have been able to enhance their agricultural productivity, improve their income, and build sustainable livelihoods.

Scientific Pig farming

Polyhouse for off season horticulture crops

3. Enhancing Income through the production of High Oleic Groundnut variety "Girnar 4

Introduction:

Mr. Lalnunzira is a diligent and humble farmer from Chawnhu village, and his land is situated on the hillside of Chawnhu facing Eastward. His land area is 3 hectares having very fertile soil and he has cultivated different crops throughout the year for 10 years. He was motivated in groundnut cultivation after multiple interactions with KVK under the FLD programme. He extended his cultivating area for large-scale production of groundnut after knowing the adaptability and quality of Girnar 4 variety in the region. He is a real role model for many farmers in Chawnhu village.

Intervention of KVK

Girnar 4 was first introduced by KVK Lawngtlai district in Mizoram, and it is proven that it can be successfully cultivated in Mizoram climatic conditions. Mr. Lalnunzira is one of the farmers who got selected for groundnut cultivation under the FLD program, and he was provided with seeds, fertilizers, and chemicals

for the successful cultivation of groundnut. He was also instructed to manage his groundnut field scientifically by maintaining line sowing, fertilizer application, and timely application of chemicals for pest control etc. His dedication as well as periodic visits and guidance provided by KVK scientists make the cultivation of groundnuts (Girnar 4) more successful.

Result

The intervention of KVK through different activities yielded a positive result in the achievement of Mr. Lalnunzira. He was given advice whenever required to perform scientifically from sowing to harvest resulting in timely application of fertilizers, timely control of pests and diseases, and proper management of another necessary cropping environment. After the involvement of KVK, he gained very good practical experience in the management of crops in his farming profession. The number of pods produced per plant is 40-60 with a shelling percentage of 67%, 100 seed weight of Girnar 4 was 64g. and the average plant height was 60.2 cm and it can be harvested after 110 days. The productivity of Girnar 4 on his farm was 2700 kg/ha which is higher than the national average groundnut productivity (1863kg/ha). Based on the local market rate (Rs 150/kg) within four and half months he could earn Rs 1,44,720.0 from one acre of land.

There was no marketing problem within Lawngtlai area this is because there is no production of groundnut in the area so, within a short period he could sell out almost all production. He also extracted more valuable groundnut oil and the demand for his product was very high in the Lawngtlai town. Before the KVK intervention he used to grow maize and rice on the terrace, but the marketing rate and productivity were lower when compared to the improved variety after the KVK intervention. The economic analysis before and after the KVK intervention is given in the table below: -

Economic parameters	Before Intervention (Maize and Rice)	After Intervention (Girnar 4)
1. Cost of production (Rs.)	31800/-	38600/-
2. Gross Income (Rs.)	53,900/-	1,08,540/-
3. Net Income (Rs.)	22,100/-	69,940/-
4. BC Ratio	1.69	2.8

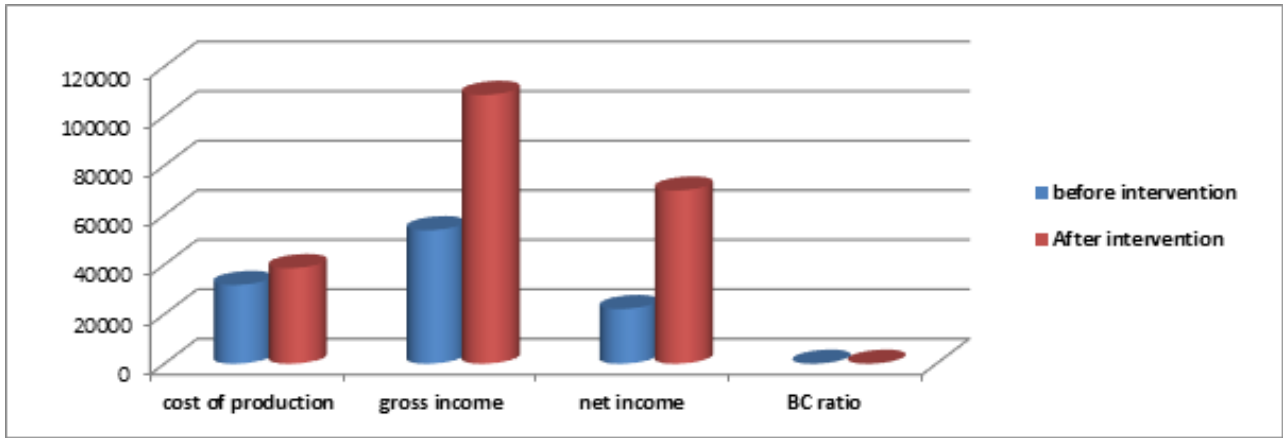

Figure 1 : Graphical representation

Impact

Mr. Lalnunzira used to cultivate different types of crops on his farm, but Girnar 4 variety of groundnut is the best crop he had ever cultivated on his farm. Groundnut crops are not common among farming communities within Lawngtlai district, but the demand is very high. Mr. Lalnunzira said that many people approached him for his groundnut, and he could easily sell Rs 150-200/kg within a short period in the market mainly due to the unavailability of fresh groundnuts in the locality and the nutritious nature of groundnut. Within a short period, he could earn a lot of money with a high net income which is having a high BC ratio. Cultivation of groundnut not only provided high financial benefits but also enriched soil fertility in a permanent land due to its ability to fix atmospheric nitrogen through its leguminous nature of groundnut. He thought that his land would improve its fertility after cultivating groundnut which would be a good foundation of his permanent land to make his land more productive in the future. He is determined to grow groundnut in the years to come due to the benefits he gained in the form of financial benefits and soil improvement.

The horizontal spread of the technology become easier after the spread of Mr. Lalnunzira's great achievement. He became the best example of groundnut farmer and many farmers like to cultivate groundnut in their farm after seeing his groundnut field. The popularization of the groundnut cultivation programme under FLD helped to be more self-sufficient in seed requirements for many farmers leading to many farmers cultivating for the first time. People these days are aware of the value of fresh and nutritious food even in a small local area which is mainly due to improvement in the mindset of general people in modern time.

Cultivation of Girnar variety in farmer's field

4. Organic King Chilli cultivation boosted the income of farmers.

Introduction

Mrs. Inali Sumi is an enthusiastic and hard-working, small farmer from Sukhai village. She and her family solely depend on agriculture for their livelihood. She grows paddy as a major crop along with some seasonal vegetables but this could not meet her family's needs financially. Top of Form

KVK Intervention

KVK, Zunheboto identified Mrs. Inali as an active participant during our training program at her village where she shared her interest with KVK subject expert in farming any crop that can generate income for her family. Based on suitable climatic conditions of the village, KVK intervened and initiated Organic King Chilli cultivation under the FLD program.KVK provided her quality planting materials, organic manures, biofertilizer, and Trichoderma with technical support for demonstration in an area of 0.5 acres.

Result

By adopting all scientific methods, she could harvest her crop @ 995kg in an area of 0.5 acre which is 429kg higher as compared to traditional practice 566kg. She could earn a gross income of Rs. 1, 49,250.00 with a cultivation cost of Rs. 40, 000.00/0.5acre with a B.C. ratio of 3.7.

The technology on Organic cultivation of king chilli was a successful demonstration initiated by KVK and this technology can be adopted in different locations at large scale. The technology provided to farmers was satisfactory and acceptable as it performed better than the farmers' traditional practice and the incidence of disease and pest attack was also negligible. So, it can be taken up on a large scale.

Impact

The technology provided increased the yield of the crop which led to an increase in the income of farmers for livelihood. The improvement in the financial status of Mrs. Inali motivated around 25 farmers from her village and neighboring villages. The farmer sold her fresh king chilli in the local market and post-harvest technology and value-addition training were also imparted by KVK and this fetched her additional income. Through this income-generating crop, she could earn money and could manage her family and children's school fees. So, from this result, a greater number of farmers (25) have been motivated and taken up cultivation of this crop.

FLD of King Chilli

King Chilli production

5. Natural Farmer of Tripura converts adversity into opportunity

Introduction

Rajesh Das is a young progressive farmer in Gomati district. By adopting new technologies, he was able to draw the attention of the villagers to cultivating various crops in his fields. All year round, vegetables, rice, and oil seed crops are grown in his field. He has four (4) numbers of cows and six (6) numbers of goats. Following him, neighboring farmers have also adopted multiple cropping systems in their fields. His hardwork towards farming made him one of the most successful farmers in the village.

Interventions of KVK

Rajesh Das possesses a 2 ha of agriculture land. As a progressive farmer he used chemical fertilizer and pesticides in his field for last 5 years. He observed that by continuous application of chemical fertilizer and pesticides in his field, incurred an increase cost of production. After Visiting KVK Gomati office, he was advised to adopt natural farming in his field. He attended training program on natural farming in KVK Gomati. Method demonstration, trainings on natural farming were imparted to farmers. As an initial attempt he has adopted natural farming on broccoli farm. Thereafter he followed natural farming practice in pointed gourd and brinjal field as well. He is preparing Jeevamrut and Jivamrut by collecting cow dung and cow urine from his own cows. He is applying paddy straw mulch for conserving moisture.He is also preparing Neemastra and Agniastra as pesticide in his farm. for the forthcoming kharif season vegetable crops he plans to incorporate natural farming techniques in cowpea, ridge gourd and Bitter gourd. Scientists of KVK Gomati gave technical assistant to him for adopting natural farming techniques.

Result

In the year 2022-23, he has grown broccoli in his farm. He has successfully grown broccoli in 1 acre and sold 10.4 tons of broccoli of Rs. 166480/- . He has collected cowdung and cow urine from his own cattle for preparation of Jivamrut, Ghana Jivamrut. He spent about Rs.61250/- for cultivation of broccoli in his farm. His net income is Rs.105230/-.

Results under Practising Natural Farming on Broccoli

Sl. No.	Parameter	Result
1	Average plant height	38.5 cm
2	Average head weight	320 g
3	Average head diameter	12.5 cm

Fig: Pointed Gourd

Fig: Brinjal

Local cultivars of Brinjal and Pointed Gourd crops are grown in his field by adopting Natural farming.

Table 1: General Physico-chemical properties of experimental soil under of Natural Farming

Soil Properties	Description
Soil Texture	Clay Loam
Soil P^H	4.9
EC (ds/m)	0.050
Organic Carbon (%)	0.53
Available N_2(Kg/ha)	252.10
Available P by Bray" s method (Kg/ha)	44.35
Available K_2O(Kg/ha)	161.28
Zinc (mg/kg)	0.82
Boron (mg/kg)	0.84
Iron (mg/ kg)	19.7
Copper (mg/kg)	1.04

Impact

As natural farming is basically local cow-based farming, where almost all types of inputs are available in farm itself, Rajesh Das is influencing other farmers for adopting natural farming by using own farm resources. According to farmer views, in his first harvest of broccoli fetches good price due to its quality compare to chemical based product because the components of natural farming Agniastra and Neemastra are very much effective for controlling pests. The effectiveness of Agniastra and Neemastra are also spreading among farmers in the neighborhood. The endeavour of Rajesh Das for adopting natural farming created positive response among farmers.

12 Status of Budget

During the financial year 2023-24, an amount of Rs. 9608.24962 lakh was utilized against the allotted budget of Rs. 9608.81 lakh. Head-wise details of budget and expenditure are furnished in Table 46

Table 1: Allocation & Expenditure for F.Y 2023-24 Under ICAR-ATARI, Zone-VII,Umiam

(Rs. in lakhs)

Head	RE 2023-24				Expenditure			
	ATARI	KVKs	Support to DEEs	Total	ATARI	KVKs	Support to DEEs	Total
A) Recurring								
Pay & Allowance	194.34545	7123.46455	0.00000	**7317.81000**	193.78507	7123.46455	0.00000	**7317.24962**
Contingency	96.71778	1323.55630	9.50000	**1429.77408**	96.71778	1323.55630	9.50000	**1429.77408**
HRD	69.96242	25.82000	5.00000	**100.78242**	69.96242	25.82000	5.00000	**100.78242**
TA	14.64502	135.44848	5.10000	**155.19350**	14.64502	135.44848	5.10000	**155.19350**
TOTAL	**375.67067**	**8608.28933**	**19.60000**	**9003.56000**	**375.11029**	**8608.28933**	**19.60000**	**9002.99962**
B) Non Recurring Head								
Works	111.50000	475.57623	0.00000	**587.07623**	111.50000	475.57623	0.00000	**587.07623**
Furniture, IT & Equipment	7.70598	2.00000	0.00000	**9.70598**	7.70598	2.00000	0.00000	**9.70598**
Library	0.00000	0.00000	0.00000	**0.00000**	0.00000	0.00000	0.00000	**0.00000**
Vehicle	0.00000	8.46779	0.00000	**8.46779**	0.00000	8.46779	0.00000	**8.46779**
TOTAL	**119.20598**	**486.04402**	**0.00000**	**605.25000**	**119.20598**	**486.04402**	**0.00000**	**605.25000**
GRAND TOTAL (A+B)	**494.87665**	**9094.33335**	**19.60000**	**9608.81000**	**494.31627**	**9094.33335**	**19.60000**	**9608.24962**