ORGANISATION AND WORKING OF KRISHI VIGYAN KENDRA IN MAMIT DISTRICT, MIZORAM

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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DEPARTMENT OF PUBLIC ADMINISTRATION
SCHOOL OF SOCIAL SCIENCES
MARCH, 2024

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Submitted
In partial fulfilment of the requirement of the Degree of Doctor of Philosophy in Public Administration of Mizoram University, Aizawl.

DEDICATION

Lalchharliani Sailo (1943-2023)

In recognition and appreciation of her Love,

Prayer, Inspiration and

Compassion that showered upon me,

With mu inmost gratitude, admiration and honour

I dedicate this Thesis to my beloved Grandmother

Who left us for heavenly abode on 7th July, 2023.

मिजोरम विश्वविद्यालय
आईज़ल-७९६००४

MIZORAM UNIVERSITY
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CERTIFICATE

This is to certify that the present research work titled **"*Organisation and Working of Krishi Vigyan Kendra in Mamit District, Mizoram*"** is the original research work carried out by Mr. Samuel Lalramdika Hnamte under my supervision. The work done is being submitted for the award of the Doctor of Philosophy (Ph.D.) in the Department of Public Administration, School of Social Sciences, Mizoram University.

This Thesis has been the outcome of his original research work and it does not from a part of any other Theses submitted for the award of any other Degrees in any other Universities. He is, therefore, permitted to submit his Thesis for examination.

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DECLARATION

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March, 2024

I, Samuel Lalramdika Hnamte, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to do the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/Institute.

This is being submitted to the Mizoram University for the degree of Doctor of Philosophy in Public Administration.

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ACKNOWLEDGEMENT

At the outset, I express my deep sense of gratitude to my Supervisor, Prof. Lalrintluanga, Sr. Professor & Head, Department of Public Administration, Mizoram University for his precious guidance and constant encouragement throughout the entire course of this investigation.

I express my gratitude to the officers and staff of Krishi Vigyan Kendra, Mamit District for rendering help by providing me useful information and allowing to visit their office.

I convey my sincere thanks to the Department of Public Administration, Mizoram University for their academic guidance and assistance for the success of this study.

I honour my parents, Dr. Vanlalhruaia Hnamte and Pi. H. Lalnunmawii, who had also been deeply involved during my entire research work, who encouraged and supported me not only in my studies but also in whatever steps I take.

I am truly indebted to my younger brother John Lalramhluna Hnamte, whose unflagging moral support always encouraged me to work hard.

Above all, I thank the Almighty God for his mercy, who gives me endurance and perseverance to face the challenges and for blessing me with good health.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

1.	@	At the rate
2.	AAP	Annual Action Plan
3.	AIBP	Accelerated Irrigation Benefit Programme
4.	ARYA	Attracting and Retaining Youth in Agriculture
5.	ATARI	Agricultural Technology Application Research Institute
6.	ATMA	Agriculture Technology Management Agency
7.	AWS	Automatic Weather Station
8.	CAU	Central Agricultural University
9.	CCSAMMN	Climate Change and Sustainable Agriculture: Monitoring, Modelling and Networking
10.	CFLD	Cluster Frontline Demonstration
11.	CGIAR	Consultative Group on International Agricultural Research
12.	CH	Crop Husbandry
13.	cm	Centimetre
14.	CPCT	Centre for Protected Cultivation Technology
15.	DAC & FW	Department of Agriculture, Cooperation & Farmers Welfare
16.	DAHD & F	Department of animal Husbandry, Dairying & Fisheries
17.	DAMU	District Agricultural Meteorological Unit
18.	DAO	Decentralised Autonomous Organisation
19.	DARE	Department of Agricultural Research and Education
20.	DHO	Distinctive Health Organisation
21.	DRDA	District Rural Development Agency
22.	ECOCERT	Organic Certification Organisation
23.	FAO	Food and Agricultural Organisation
24.	FCAC	Farmers Capacity Assessment & Certification
25.	FFS	Farmer Field School
26.	FIGs	Farmer Interest Groups
27.	FLD	Front-Line Demonstration
28.	FPO	Farmer Producer Organisation

29.	FSGs	Food Security Groups
30.	g/m^2	Gram per meter square
31.	GAU	Graphical User Interface
32.	GDP	Gross Domestic Product
33.	gm	gram
34.	Ha	Hectare
35.	HDPE	High Density Polyethylene
36.	HYVs	High Yielding Varieties
37.	ICAR	Indian Council of Agricultural Research
38.	ICDs	Integrated Child Developments
39.	ICT	Information and Communication Technology
40.	IDD	Integrated Dairy Development Project
41.	IDM	Integrated Disease Management
42.	IIHR	Indian Institute of Horticultural Research
43.	INM	Integrated Nutrient Management
44.	IPM	Integrated Pest Management
45.	IPNM	Integrated Plant Nutrient Management
46.	IPP	Improved Package of Practice
47.	ITK	Indigenous Technical Knowledge
48.	IWM	Integrated Weed Management
49.	Kg	Kilogram
50.	Kg/ha	Kilogram per hectare
51.	Kg/m^2	Kilogram per meter square
52.	KSHAMTA	Knowledge Systems and Homestead Agriculture Management in Tribal Areas
53.	KVKs	Krishi Vigyan Kendras
54.	mg	Milligram
55.	mm	Millimetre
56.	MOM	Mission Organic Mizoram
57.	MoT	Ministry of Tourism
58.	MOVCD-NER	Mission Organic Value Chain Development for North Eastern Region

59.	MT	Machine Translation
60.	NABARD	National Bank for Agriculture and rural Development
61.	NADEO	National Association of Diocesan Ecumenical Officers
62.	NAPCC	National Action Plan on Climate Change
63.	NARI	Nutri-sensitive Agricultural Resources and Innovations
64.	NARP	National Agriculture Release Program
65.	NARS	National Agricultural Research System
66.	NFHs	National Family Health Survey
67.	NFSM	National Food Security Mission
68.	NGOs	Non-Governmental Organisation
69.	NLUP	New Land Use Policy
70.	NMAET	National Mission on Agriculture Extension and Technology
71.	NMAET	National Mission on Agricultural Extension and Technology
72.	NMOOP	National Mission on Oil Seeds and Oil Palm
73.	NMSA	National Mission for Sustainable Agriculture
74.	Nos	Numbers
75.	OFT	On Farm Trial
76.	OFWM	On Farm Water Management
77.	PFMS	Public Finance Management System
78.	PGS	Participatory Guarantee System
79.	PKVY	Paramparagat Krishi Vikash Yojana
80.	PMFBY	Pradhan Mantri Fasal Bimo Yojana
81.	PMJJBY	Pradhan Mantri
82.	PMKSY	Pradhan Mantri Krishi Sinchai Yojana
83.	PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
84.	PMT	Project Management Team
85.	PPT	Power Point Presentation
86.	PRA	Participatory Rural Appraisal
87.	PVKY	Paramparagat Krishi Vikas Yojana

88.	q/ha	Quintal per hactare
89.	QPM	Quality Protein Maize
90.	Qtls	Quintals
91.	R&E	Research and Education
92.	RAD	Rainfed Area Development
93.	RKVY	Rashtriya Krishi Vikas Yojana
94.	RKVY-RAFTAAR	Remunerative Approaches for Agriculture and Allied Sector Rejuvenation
95.	RRA	Rapid Rural Appraisal
96.	SAC	Scientific Advisory Committee
97.	SAME	Sub-Mission on Agricultural Extension
98.	SAP	State Action Plan
99.	SAU	State Agricultural University
100.	SGHs	Self-Help Groups
101.	SHC	Soil Health Card
102.	SHCP	Soil Health Card Portal
103.	SHM	Soil Health Management
104.	SMAE	Sub-Mission on Agricultural Extension
105.	SMAM	Sub-Mission on Agricultural Mechanization
106.	SMPP	Sub-Mission on Plant Protection and Plant Quarantine
107.	SMS	Subject Matter Specialist
108.	SMSP	Sub-Mission on Seed and Planting Material
109.	Sq.m	Square meter
110.	SRI	System of Rice Intensification
111.	SS & Hs	Senior Scientist & Heads
112.	STRY	Skill Training for Rural Youth
113.	t/ha	Metric tonnes per hectare
114.	URL	Uniform Resource Locator
115.	VATICA	Value Addition and Technology Incubation Centres in Agriculture
116.	WM	Water Management

117.	WRC	Wet Rice Cultivation
118.	Wt	Weight
119.	WTO	World Trade Organisation
120.	ZPD	Zonal Project Director

CHAPTER -I
INTRODUCTION

1.1. Background

Agriculture was a key tool in the rise of sedentary human civilization, as farming of domesticated species resulted in food surpluses that fostered and nurtured civilization's development. The history of Agriculture's history dates back thousands of years, and its evolution has been greatly influenced by climatic conditions, cultural aspects, and technological inputs. However, all farming relies on specific techniques, tools, and equipment to expand and maintain the lands in order to raise domesticated species in a sustainable manner.

The world population is growing very fast. In 1950 it was 2.5 billion and increased to 5.3 billion by 1990 and it is projected to be 7.2 billion by the year 2010. In the last two decades the increment in the world population is 1.9 billion (36%). Further, in the current pace of growth rate the world population is projected by the Food and Agriculture Organisation (FAO) to be 8.9 billion by 2030. With the rising population, there is a need for increasing the supply of food and feeding material in the world. The World Food Summit (1997) predicted that food production in developing countries must be tripled by the year 2050 to cater the demand created by the expected doubling of the human population and their increasing standard of living. Globally, there will be sufficient food for a growing world population by the year 2030, but hundreds of millions of people in developing countries will remain hungry and many of the environmental problems caused by agriculture will remain serious, according to the summary report of "World Agriculture: Towards 2015/2030," a study launched by the FAO.[1]

Indian scenario in agriculture is different. Apart from the flattening of yields over the past two decades, the average agriculture productivity in India

[1] Rao, V.Praveen and Veeraraghavaiah, R. (2007), *Farming Systems and Sustainable Agriculture*, New Delhi: Atlantic Publications, p.25.

also lies below the optimum level. The growth spurt ignited by the Green Revolution in the 1970 is now seeing diminishing returns to technology.

After independence from the British rule, Indian Agriculture has overcome several challenges from an import based food security to a respectable position of self- reliant food security. India's National Agricultural Research System (NARS) has contributed significantly to generate the Green, White, Golden and Blue Revolutions. Today, agriculture alone contributes 22% to the National Gross Domestic Product (GDP). But still, Indian Agriculture is regarded as gamble mostly depending on monsoon. Moreover, the various technological revolutions are yet to touch especially the North Eastern part of the country where agricultural production system is regarded as complex, diverse and risk prone. Here, agricultural production system is faced with several constraints, like depleting and degrading natural resources, increasing biotic and abiotic stresses, energy supply and decreasing factor productivity. A multidisciplinary approach covering agriculture, horticulture, livestock and fisheries and its improved productivity is the only viable option to enhance the agricultural production in these regions.

Again, in the North Eastern States like Mizoram, the situation is completely different. Most of the people observe the state as organic "by default." In the last 30 years, the state has not been able to do any remarkable job in the field of agriculture, especially for attaining independency in food supply. At the same time, the population of the state is growing very fast and the last decadal growth rate was 28.82%. So, in this current global scenario, policy makers have to rethink on the long-term basis for the development of agriculture of the state. Another fact is that, the crisis for food is going to increase in other parts of the country with the increasing population pressure. Therefore, we need to be independent in our food grain production.[2]

Gunner Myrdal said: "It is agricultural sectors that the battle for long-term economic development will be won or lost." Therefore, whether we accept

[2] Pal, Mahi (2016), *Agriculture and Farmers' Welfare: New Initiative and Challenges,* New Delhi: Deep and Deep Publications, p.45.

or not, agriculture continues to be a fundamental instrument for sustainable development and poverty alleviation in the 21st century. Agriculture contributes to socio-economic development in many ways. It contributes to development as an economic activity, as a livelihood, and as a provider of developmental services, making agriculture a unique instrument for development.

Today, there are millions of people living in extreme poverty and thus many are dying due to hunger and malnutrition. Sustained agriculture production is essential for food security because it is a source of income for majority of the rural population in India. It is also a source of income for majority of the rural people and therefore, very critical for our country. For making the goal of sustained agriculture production a reality, promotion of agricultural sector is imperative. So, effective development strategies are critical for promoting agriculture and increasing production and productivity.

In consonance with the above views, the Krishi Vigyan Kendras (KVKs) in the states focus on testing and introduction of suitable and viable technologies to achieve the targets set forth and create developing agricultural sector. For sustainable development, the tailor-made action programmes to garner the need of precision farming and organic agriculture have to be visualized where the KVKs will play the prominent role. Horticulture and Floriculture have tremendous potential and will greatly expand the agricultural economy while animal Husbandry will help retain scarce financial resources within the state. The KVKs as "Knowledge Centres," have to link up with public-private partnership in a workable manner to sustain the envisioned development of all agriculture and allied sectors.[3]

1.2. Review of Literature

Agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. It employs more than 50% of the Indian work force and contributed 17–18% to country's GDP. Therefore, there are vast arrays of books and articles related to it. However,

[3] Rao, V. Praveen and Veeraraghavaiah, R. (2007), *Op.cit.*, p.32

researches on the functioning of KVKs in Mizoram are practically non-existent although there have been few studies carried out on some facets related to Agriculture in Mizoram. With the purpose of facilitating the proposed study, a few books and articles related to the context have been chosen and some of those books and articles are reviewed as follows:

Domonic Moran, in his book (2020), *The Economics of Farm Animal Welfare,* describes the latest developments in economic research relevant to farm animal welfare. A range of global experts and key opinion leaders outline the challenges of achieving sustainable intensification while improving both climate change and animal welfare, and make policy-relevant recommendations for the future. The book examines the Origins, cross-disciplinary interactions and the future of farm animal welfare. It also talks about Consumer demand and changing preferences as animal welfare rises up the social agenda. This book provides a thought-provoking yet evidence-based review for all those interested in quantifying farm animal welfare.

R. K. Nanwal (2020), in his book, *Farming System and Sustainable Agriculture,* discusses about farming system-scope, importance and concept, types and systems of farming system and factors affecting types of farming, farming system components and their maintenance and its advantages, allied enterprises and their importance, tools for determining production and efficiencies in cropping and farming system, sustainable agriculture-problems and its impact on agriculture, conservation agriculture strategies in agriculture like HEIA, LEIA and LEISA and its techniques for sustainability. He also describes about resource cycling and flow of energy in different farming system, multiple cropping system, efficient cropping system and their evaluation and also new concept and recent approaches in farming systems.

K. P. Sudheer and P. K. Suresh Kumar (2018), in their book, *Protected Cultivation and Post-Harvest Technology,* attempt to describe the Greenhouse technology. The book talks about plant response to greenhouse environment, planning and design of greenhouses, irrigation system used in greenhouses-rules of watering, greenhouse equipment, components of greenhouse, greenhouse drying methods and applications, cleaning and grading, different cleaners and

separators, drying, types of dryers, material handling equipment, destructive and non-destructive methods.

V. Praveen Rao and R. Veeraraghavaiah (2017), in their book, *Farming Systems and Sustainable Agriculture,* examine the adverse effects of modern agriculture, the factors effecting ecological balance and sustainability of agricultural resources, soil related problems, soil degradation, deforestation, accelerated soil erosion, siltation of reservoirs etc. and also the causes and extent of these problems in India and ameliorative measures. They also discuss the fundamentals of farming systems and sustainable agriculture the various components of organic agriculture.

Joy Mench (2017), in her book, *Advances in Agricultural Animal Welfare: Science and Practice,* highlights some emerging issues in agricultural animal welfare. The book provides an in-depth review of research and application in agricultural animal welfare and there is coverage of topics important to all agricultural animals and complements in a wider series. There is also a particular focus on ethics and animal behaviour and welfare.

Sreenath Dixit (2017), in his article *Organic Farming,* highlights the importance of meliponiculture, introduction of high yielding varieties of crops and institutional approaches to address malnourishment through promotion of nutrimix. He also gave importance to the development of organic farming practices, testing of the efficacy of organic plant protection agents, watershed-based development activities, promotion of farming system approach for maximizing farm income and ensuring sustainability.

Mahi Pal (2016), in his Article, *Agriculture and Farmers' Welfare: New Initiative and Challenges,* highlights the new initiatives introduced by the Central Government which are aimed at rectifying the contortion regarding the structural problems such as rising input costs for farmers, downfall of public investments in agriculture, agriculture marketing. It also highlights the different programmes undertaken by the Central Government to nourish agriculture sectors such as: Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Paramparagat Krishi Vikas Yojana (PVKY), Pradhan Mantri Fasal Bimo Yojana (PMFBY), Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), Soil Health Card

Scheme, Pradhan Mantri Suraksha Bima Yojana (PMSBY), Strengthening of Research and Extension, National Agriculture Market, etc.

J P Mishra (2016), in his article, *Agriculture and Farmers Well-being*: *Present Scenario,* mentions about the importance of inclusive development for the increase of productivity. Addressing agrarian distress, providing remunerative prices to farmers, reforms related to market and lands are the vital keys for the promotion of occupational diversification and agricultural competency. The article also highlights that the two important schemes launched by the Government which are: Pradhan Mantri Suraksha Bima Yojana (PMSBY) and Organic Value Chain Development in North East Region (Value Chain Based Organic Farming Scheme). Under PMBSY, five lakh acres of land is expected to be brought under organic farming over a period of three years. In Value Chain Based Organic Farming Scheme, value edition will stress upon so that organic products grown can acquire domestic as well as export markets.

P. Chowdappa (2015), in his Article, *Transfer of Agricultural Technologies Among the Farming Community,* points out the necessity of OFT. On farm trials are the testing grounds for the promising technologies coming out from the research institutions and fine-tuning before large-scale roll-out through extension agencies, and on-farm testing looks for the most appropriate technology solution for the most appropriate technology solution for the most pressing problems in a given locality / specific target group. He also stresses on the growing demand of FLDs. FLDs are devised as the ideal tools to put across convincingly the performance of new varieties / recommended production technologies on farmers' fields under real farm returns.

Ben Falk (2013), in his book, *The Resilient Farm and Homestead: An Innovative Permaculture and Whole Systems Design Approach Comprehensive*, describes how-to manual with information on growing perennial crops, soil fertility, water security, nutrient dense food, etc. The book includes detailed information on gravity-fed water systems, fuel wood hedge production and processing, human health through nutrient-dense production strategies, rapid topsoil formation and remineralisation, agroforestry, silvopasture & grazing, earthworks, species composition, the site-design process and site management,

ecosystem services especially regarding flood mitigation, tools and appropriate technology guides, etc. It gives theories for regenerative site development. It offers actual working results from a complex farm-ecosystems based on research in permaculture, and presents a viable home-scale model for an intentional food-producing ecosystem in cold climates.

Mark Shepard (2013), in his book, *Restoration of Agriculture: Real-World Permaculture for Framers* mentions that every single human society that has relied on annual crops for staple foods has collapsed. Restoration Agriculture explains how we can have all of the benefits of natural, perennial ecosystems and create agricultural systems that imitate nature in form and function while still providing for our food, building, fuel and many other needs in our own backyard, farm or ranch. This book, based on real-world practices, presents an alternative to the agriculture system of eradication and offers exciting hope for our future.

Pradeep Singh (2012), in his article, *Agricultural Research in India: An Exploratory Study*, attempts to bring out the significance of agriculture in the economy of the country as Agriculture is the backbone of the Indian economy as it plays the most decisive role in the socioeconomic development of the country. He further highlights that Indian agriculture is a miscellaneous and extensive sector involving a large number of actors and has one of the largest and institutionally most complex agricultural research systems in the world. The agricultural research system in India includes some 27,500 scientists and more than one lakh supporting staff actively engaged in agricultural research, which makes it probably the largest research system in the world. He also mentions the needfulness of research and education in the field of farming practices to accomplish the optimum output.

C. Lalnithanga (2011), in his book, *Loneitu Thian*, talks about the progress of Mizo society as a whole in the field of farming. He highlighted that even though many positive changes have been witnessed in the field of agriculture amongst the Mizos, there are still some loopholes that is needful to be addressed. The book describes the Agro Eco System Analysis (AESA) and explains the “Integrated Pests Management” as well as “Integrated Pests

Management Packages" so as to increase the productivity and bring about economy in the field of farming.

Adam D. Sheingate (2010), in his book, *The Rise of the Agricultural Welfare State,* traces the development of government intervention in agriculture from nineteenth-century to on temporary struggles over farm subsidies. This well-crafted study not only puts a new spin on agricultural policy, but also makes a strong case for the broader claim that the relatively decentralized political system is actually less prone to capture and rule by sub governments than the more centralized political systems. He also demonstrates, in a widely useful way, how past institutional developments shape current policies and options**.**

Trilochan Mohapatra (2008), in his article *Transforming Agriculture,* mentions that agriculture is to transform India. He gave stress to the role of science and technology in agriculture which is crucial in not only ensuring food security of the country and affordability of the food items for the public at large, but also in providing farmers a competitive edge in the present day global community markets. He also elaborated the importance of technology assessment and refinement, knowledge dissemination and providing critical input support for the farmers with a multi-disciplinary approach.

N. K. Sharma and Sarita Sharma (2007), in their book, *Role of Agriculture in Indian Economy,* highlights that India has been known as an agricultural country and agriculture has formed the backbone of the Indian economy for a very long time. The book highlights that agriculture occupies the largest sector in the Indian economic activity and has a crucial role to play in the country's economic development. Agriculture, including irrigation and power was given the topmost priority in the First Five Year Plan of India. Problems of Indian Agriculture were also highlighted in the book. They also gave stressed on the characteristics of agricultural labour in India.

Arunachalam and Neetaji Seetharaman (2004), in their book, *Sustainable Agriculture,* emphasized that the biggest challenge faced by India after independence was feeding millions of the hungry masses. Since the country's production was insufficient, India had to beg food grains from the neighbouring

countries. But then after a while, India attained self-sufficiency, but this achievement was possible only through the use of excessive chemical fertilizers. Also, excessive withdrawal of ground water and continuous cultivation of crops was done. But then these factors adversely affected the natural resources, thus effecting soil fertility, soil erosion, deforestation, etc. was witnessed. Therefore, they emphasized on the growing need of integrating traditional knowledge into modern agricultural methods so as to accomplish sustainable farming systems.

S. Roderic (2004), in his book, *Animal Health and Welfare in Organic Agriculture,* examines the rapid growth of organic farming that has been among the most remarkable changes in global agriculture in recent decades. However, more attention was initially aid to the crop side of organic systems, and animals are a lower priority in formal research and the development of organic farming. But now, that has changed. There is now greater recognition of the need to understand animal health and welfare better. The purpose of this book is to further the understanding of organic animal husbandry and to demonstrate practical solutions and innovative methods, drawing mainly on research and practical experience with organic farming.

R. Thansanga (2000), in his book, *Agriculture in Mizoram,* describes the activities of agriculture in Mizoram and also the allied sectors such as Sericulture, Fisheries, Floriculture and Horticulture. He also highlights the new farming venture known as organic farming. He even talks about the scheme of land reclamation in which people started terrace cultivation and contour trench farming for permanent cultivation by replacing shifting cultivation.

S. P. Palaniappan (1995), in his book, *Agriculture Input and Environment,* highlights that the environmental problems are increasing and becoming threats especially in developing countries. Excessive use of chemical fertilizers to boost the agriculture output has deteriorated land and water resources, eventually results in the environmental pollution and adversely affecting the natural resources. The book highlights the importance of environmental conservation while optimally utilizing the available resources without damaging the environment to a vast extent.

A.K. Agarwal and S. P. Shukla (1986), in their book, *Agriculture in North Eastern Region*, describe the impact of geomorphic process, edaphic changes and socio-economic conditions on agricultural practices in the north east region of India. The book suggests different models for the improvement of agriculture practice in the hilly and plain areas and simultaneously suggest for the improvement of technology in the field of farming practices. The book also talks about the role of North Eastern Council (NEC) in the development of agriculture and its allied sectors while stating that the region has rich water resources which have not been utilised to the maximum extent.

Ramesh Kumar Lekhi (1984), in his book, *Technological Revolution in Agriculture (A Case Study of Punjab),* highlights the different technologies and methods used for improving agricultural production. The book also reveals that, with a view to bringing about the desired reforms and improving the farm productivity, the State Government of Punjab passed Pepsu Abolition of Ala Malkiat Rights Act, Pepsu Occupancy Tenants Act, Punjab Security of Tenures Act in 1953. It also highlights new agricultural strategies, like high yielding variety crops, chemical fertilizers, tractors, rotavators, etc.

Albert Howard (1940), in his book, *An Agricultural Testament*, mentions about organic farming and agricultural movement. It focuses on the nature and management of soil fertility, and notably explores composting. At the time when modern, chemical-based industrialised agriculture was just beginning to radically alter food production, it advocated natural processes rather than man-made inputs as the superior approach to farming.

1.3. Research Gap

The above published works under review have not specifically dealt with Krishi Vigyan Kendras (KVKs) in Mizoram. In fact, most of the works under review have covered studies of Agriculture in other parts of India in general without specifically studying KVK in Mizoram which has recently received the National Award from the President of India in recognition of its significant

contribution for promoting the welfare of the farmers in Mizoram. Hence, the present researcher has taken up this area for the study.

1.4. Statement of the Problem

The objective of the KVK is to work on assessment, refinement and transfer of agricultural and allied technologies and transfer of skill through training in agriculture and allied sectors for the farmers of the district.Accordingly, KVK for Mamit District was inaugurated on 31st May'2008 at Lengpui with the aforesaid objective to improve the socio-economic condition of the farming community and to accelerate the agricultural production.

Mamit District is one of the young districts of Mizoram whose economic base is largely dependent on agriculture and its allied sectors. The major crops grown by the farmers in the district are rice, maize, sugarcane, bird's eye chillies, ginger and vegetables like tomatoes, cabbages, beans, etc. Since its inauguration as a district level farm science centre, KVK, Mamit District, has been provided with proper organisational structure to fulfil its objectives to address and overcome the challenges faced by the farmers. The Officers & staff of KVK, from Lengpui moved to action to bring forth changes to the farming community of Mamit District and undertook different activities like trainings, farm demonstrations, animal camps, on and off campus trainings, detailed survey of Mamit Districts. Thus, KVK, Mamit District, plays a very vital role in imparting training to the farmers, transferring and imparting technology to the farmers for the improvement of agricultural productivity.

While agriculture can play a vital role in the economic development of the district, there arebasic factors adversely affecting the working of KVK, Mamit District, such as soil exhaustion, the vagaries of nature and lack of the required knowledge of technologies by the farmers for agricultural development. All these drawbacks have prompted KVK to impart proper trainings to the farmers.

Despite intensive and lengthy efforts played by KVK throughout the district, the farmers are still facing a huge yield gap from time to time. The

major challenges faced by the farmers are lack of proper irrigation especially during the Rabi seasons, pests attack like Fall Army Worm, big competitors regarding the market supply chain from outside the state as well as within the state, loss of fertile land holdings due to shifting cultivation, etc.

The other problems faced by majority of the farmers are poor access to reliable and timely market information, absence of supply and demand forecasting, poorly structured and inefficient supply chains, inadequate cold storage facilities and shortage of proper food processing units, large intermediation between the farmers and the consumers.

Briefly, it has been felt necessary to make an in-depth study of the functions, role and working of KVK, Mamit District for agricultural development for the welfare of the farmers. Therefore the proposed study will try to provide an overview of the functioning of KVK and identify the problems and challenges encountered by it in the delivery mechanism of agriculture technology to the farmers. The study will also give suggestions that may contribute towards solutions of the problems and meet the challenges so identified.

1.5. Scope of the Study

The proposed study will focus on the organisational structure and working of the KVK with a special focus on the administration of KVK for the welfare and upliftment of the farmers within Mamit District. However, efforts will also be made to study the growth and development of KVK, Mamit District in Mizoram. The study will also analyse the Policies, Programmes and Schemes (Centrally Sponsored Schemes and State Schemes) implemented by KVK and highlight the problems and challenges faced by KVI Centre and the farmers while addressing agricultural problems. Corresponding to the problems and challenges so identified, remedial measures will be suggested for the development of agriculture for the welfare of the people in general and the famers in particular.

1.6. Objectives of the Study

The specific objectives of the study are to-

1) examine the role and functions of KVK, Mamit District.
2) understand the organisational structure and working of KVK to achieve its objectives in Mamit District.,
3) analyse the Plans, Policies, Programmes and Schemes of the State and the Central Governments implemented by KVK, Mamit District.
4) study the different achievements made by KVK for the welfare of the farmers in Mamit District.
5) study the problems and challenges faced by KVK and suggest remedial measures for the effective functioning of KVK Centre for the development of agriculture in Mamit District.

1.7. Research Questions

Following are the research questions to be answered by this study:

1) What are the role and functions of KVK for the upliftment and welfare of farmers within Mamit District?
2) How is KVK, Mamit District, organisationally structured to become more effective to achieve its objectives?
3) What are the different Plans, Policies, Programmes and Schemes of the State and the Central Governments implemented by KVK, Mamit District?
4) What are the different achievements made by KVK for the welfare and upliftment of farmers in Mamit District?
5) What are the problems and challenges faced by KVK and the corresponding remedial measures suggested for the effective functioning of KVK to develop agriculture in Mamit District?

1.8. Methodology

The study is basically historical and qualitative in nature. Primary data have been collected through surveys, interviews and focus group discussions for

eliciting information from fifty government functionaries like DAO, Scientists and Personnel from ATMA, NABARD and also from two hundred fifty beneficiaries. For collecting primary data, Questionnaires have also been prepared and administered to the officials, beneficiaries as well as the concerned functionaries like Village Council Members within Mamit District.

The secondary data have been collected from published and unpublished documents on the related topics, such as books, articles, journals, publication of the Government of India as well as Government of Mizoram. Web sources have also been used as the source of secondary information.

1.9. Chapterisation

The whole study is divided into *seven* Chapters. The *first* Chapter is an introductory chapter which begins with the introduction of background of the study, the importance of agriculture for human civilization and also with the introduction about KVK whose functioning is paramount important for fostering the growth of agriculture and its allied sectors for the welfare of farming community. It also contains Review of related literature, Research Problem, Scope of the Study, Objectives of the Study, Research Questions, Methodology and Chapterisation.

The *second* Chapter on *Krishi Vigyan Kendra: A Conceptual Study* deals with the conceptual study of KVK and also focuses on the origin, growth, unique features, principles and objectives of KVK. It also briefly gives the highlights of eight KVKs in the State of Mizoram.

The *third* Chapter on *Organisational Structure of Krishi Vigyan Kendra, Mamit District* deals with the organizational structure and the scheme of hierarchy of officers and staff of KVK Centres in relation to the host Department, that is, Agriculture Department of Mizoram Government. It also discusses the pivotal functions and role of KVK for bringing about farmers' welfare. The administrative and financial control of the KVK Centres by the host Department and ICAR is focused in this Chapter.

In the *fourth* Chapter on *Working of KVK for Implementation of Policies, Programmes and Schemes of the Central and State Governments,* an attempt has

been made to study the working of the KVK for the implementation and execution of important agricultural policies and schemes of the Central and State Governments for the welfare of the farming community of Mamit District. The aim of this Chapter is also to study various on-going schemes and initiatives taken up by the Kendra with the aim of increasing farmer's income, financial support and improving their living conditions. This Chapter also discusses the convergence of KVK, Mamit District with the allied functionaries of the district has also been briefly discussed in this Chapter.

In the *fifth* Chapter on *Achievements and Challenges of KVK, Mamit District,* an attempt has been made to find out major achievements made by the Centre and the challenges faced by it in the process and journey of promoting the welfare of farmers and the suggested remedial measures.

The *sixth* Chapter on *Results and Discussion* provides an analysis of the responses to the interview and the questionnaire by both the officials and the beneficiaries. Questionnaires were framed for eliciting information to give answers to the research questions on the functions and organisation of KVK in Mamit District and different policies, schemes and programmes taken up for implementation by the organisation which has contributed to the welfare and upliftment of farmers in the district.

The *seventh* Chapter is the concluding Chapter which has brought out the summary and findings of the study in response to the research questions.

CHAPTER-II

KRISHI VIGYAN KENDRA: A CONCEPTUAL STUDY

2.1. Introduction

Agriculture, with its allied sectors, is unquestionably the largest livelihood provider in India, more so in the vast rural areas. It also contributes a significant figure to the Gross Domestic Product (GDP). Sustainable agriculture, in terms of food security, rural employment and environmentally sustainable technologies, such as soil conservation, sustainable natural resource management and biodiversity protection, are essential for holistic rural development. Indian agriculture and allied activities have witnessed a green revolution, a white revolution, a yellow revolution and a blue revolution. The Ministry of Agriculture & Farmers Welfare (MA & FW), formerly known as the Ministry of Agriculture, is a branch of the Government of India and is the apex body for formulation and administration of the Rules and Regulations and Laws related to agriculture in India.

In June 1871, the Department of Revenue and Agriculture and Commerce was set up to deal with all the agricultural matters in India. Until the establishment of this Ministry, matters related to agriculture were within the portfolio of the Home Department. In 1881, the Department of Revenue and Agriculture was set up to deal with combined portfolios of education, health, agriculture and revenue. However, in 1947, the Department of Revenue and Agriculture was re-designated as the Ministry of Agriculture and on 15 August 2015, the Ministry of Agriculture was renamed as the Ministry for Agriculture and Farmers' Welfare to take care of farming community needs.[1] Organisationally, the Ministry of Agriculture and Farmers' Welfare consists of the following three departments:

1. The Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW)
2. Department of Animal Husbandry, Dairying & Fisheries (DAHD&F) and

[1] Singh, Pradeep (2012), *Agricultural Research in India: An Exploratory Study*, International Journal of Social Science & Interdisciplinary Research Vol.1 Issue 9, New Delhi: Atma Publishers, *p.21*.

3. Department of Agricultural Research and Education (DARE).

As mentioned above, the DARE falls under the direct control and supervision of Ministry of Agriculture and Farmers' Welfare for the dissemination of scientific knowledge and it was established in December 1973. DARE coordinates and promotes agricultural research and education in the country. It has the following four autonomous bodies under its administrative control:

1. Indian Council of Agricultural Research (ICAR).
2. Central Agricultural University, Imphal, Manipur.
3. Dr. Rajendra Prasad Central Agricultural University, Pusa, Bihar.
4. Rani Laxmi Bai Central Agricultural University, Jhansi, UP.

The DARE is the nodal agency for International Cooperation in the area of agricultural research and education in India. The Department liaises with foreign governments, UN, Consultative Group on International Agricultural Research (CGIAR) and other multilateral agencies for cooperation in various areas of agricultural research. DARE also coordinates admissions of foreign students in various Indian Agriculture Universities and ICAR Institutes.

The ICAR, formerly known as Imperial Council of Agricultural Research, is the apex body for co-ordinating, guiding and managing research and education in Agriculture including Horticulture, Fisheries and Animal Sciences in the entire country. It is an autonomous organisation which comes under the control of DARE. It was established on 16th July 1929 as a registered society under the Societies Registration Act, 1860, in pursuance of the Report of the Royal Commission on Agriculture. The ICAR, with its Headquarters at New Delhi, looks after all aspects of the agricultural research and education covering horticulture, natural resources management, agriculture engineering, agricultural extension, animal science, economic statistics and marketing and fisheries. It also functions as a coordinating link between the central and state agencies.[2]

The ICAR has played a pioneering role in ushering Green Revolution and the subsequent developments in agriculture in India through its research and technology development that has enabled the country to increase the production of food grains

[2] *Ibid*.,

by 5.6 times, horticultural crops by 10.5 times, fish by 16.8 times, milk by 10.4 times and eggs by 52.9 times since 1950-51 to 2017-18, thus making a visible impact on the national food and nutritional security. It has played a major role in promoting excellence in higher education in agriculture. It is engaged in cutting edge areas of science and technology development and its scientists are internationally acknowledged in their fields. One of its most important components is the Krishi Vigyan Kendra (KVK) **w**hich has been established across the country for the scientific dissemination of knowledge and transfer of technology.

2.2. Genesis and Growth of Krishi Vigyan Kendras (KVKs)

Education Commission (1964-66) recommended that a vigorous effort be made to establish specialized institutions to provide vocational education in agriculture and allied fields at the pre and post-matriculate levels to cater the training needs of a large number of boys and girls coming from rural areas. The Commission, further, suggested that such institutions be named as 'Agricultural Polytechnics'. The recommendation of the Commission was thoroughly discussed: during 1966-72 by the Ministry of Education, Ministry of Agriculture, Planning Commission, ICAR and other allied institutions. Finally, the ICAR mooted the idea of establishing KVKs (Agricultural Science Centres) as innovative institutions for imparting vocational training to the practicing farmers, school dropouts and field level extension functionaries.

The ICAR's Standing Committee on Agricultural Education, in its meeting held in August 1973, observed that since the establishment of KVKs was of national importance which would help in accelerating the agricultural production as also in improving the socio-economic conditions of the farming community, the assistance of all related institutions should be taken in implementing this scheme. The ICAR, therefore, constituted a committee in 1973, headed by Dr. Mohan Singh Mehta of Seva Mandir, Udaipur (Rajasthan), for working out a detailed plan for implementing this scheme. The Committee submitted its Report in 1974 which recommended the establishment of Krishi Vigyan Kendras (KVKs).[3]

[3] Government of India (1990), *Manual of Procedures (Employment)*, Department of Agricultural Research and Education, Delhi, p.5-10.

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

A High-Level Evaluation Committee on KVK was constituted by ICAR in 1984, after thorough review of the programme, strongly recommended for the establishment of 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 Sixth Plan, 89 KVKs had started functioning in the country.

During the Seventh Plan, 20 new KVKs were established. Success of KVKs at many locations created a great demand for establishment of more KVKs in remaining districts of country. Accordingly, 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 the same were established in the country, making total number of functional KVKs by the end of the Eighth Plan to 261. Number of KVKs increased to 290 during Ninth Plan with the establishment of 29 KVKS. On the occasion of 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. The centre keeps on increasing and at present, there are approximately 725 KVKs throughout India.[4]

[4] *Ibid*.,

Table: 2.3.1: Host institution-wise distribution of KVK's in different states,UTs.

Sl. No.	**Organisation**	**KVKs**
1.	SAU,CAU-State,Central Agricultural University	460
2.	ICAR Institutes	80
3.	Non-government Organisation	102
4.	Public Sector Undertaking	7
5.	State Government	58
6.	Central University,Deemed University,Other Educational Institution	18
	Total	**725**

Source: *http://www.icar.org.in/content/agricultural_extension_division (as on 28.12.2020).*

2.3. Concept of KVK

Krishi Vigyan Kendras (Farm Science Centre), an innovative science based institutions, were established mainly to impart vocational training to the farmers and field-level extension workers. The concept of vocational training in agriculture through KVK grew substantially due to greater demand for improved agricultural technology by the farmers. They not only required knowledge and understanding of the intricacy of technologies but also progressively more and more skills in various complex agricultural operations for enhancement by adding the activities related to on-farm testing and Front-Line Demonstration on major agricultural technologies in order to make the training of farmers location specific, need based and resource-oriented.

The functions of KVKs are changing with time to time to meet the newer challenges in the field of agriculture and allied Dr. P. Das (2007), former Deputy Director General (Extension) defined KVK as "KVKs are grass root level organisation meant for application of technology through assessment, refinement[5]

[5] Chowdappa, P. (2015), *Transfer of Agricultural Technologies Among the Farming Community*, Jaipur: Aalekh Publishers, p.21.

and demonstration of proven technologies under different 'micro farming' situations in a district". This definition made it clear that the transfer of technology is not the primary function of the KVK. It is the responsibility of the state departments. But the KVKs on the other hand will assess and refine the newly released technologies, demonstrate the proven technology and train farmers and extension functionaries on the same.

The training programmes were designed to impart the latest knowledge to the farmers through work experience by applying the principles of 'Teaching by Doing' and Learning by Doing.' The prime goal of KVK is to impart training as per needs and requirements in agriculture and allied enterprises to all farmers, farm women and farm youths including school dropouts in the rural area. No formal certificate or diploma is awarded, irrespective of duration of the courses to avoid the rush for jobs instead of self-employment. While designing the courses, the concept of farming system as well as farming situation are taken into account to ensure that the enterprises in which they are trained are commercially and ecologically viable, sustainable and profitable. Such vocational trainings help them to sustain themselves through self-employment and to make them self-reliant economically and thus discourages them to migrate to the urban areas.

KVKs provide training not only in agriculture and allied vocations but also in other income-generating activities that may supplement the income and non-formal or a combination of both, depending upon the needs but emphasis remains to be on work-experience, as suggested by Mohan Singh Mehta Committee report that "the programme should be operated as a plan of continuing education both in the technical and general sense."

The KVKs, thus, are the down-to-earth institutions committed to vocational training, transfer of latest technologies, on farm research and thus, serving as the light house for overall rural development in the district. The activities of the KVK include technology assessment, refinement and transfer, aiming to bridge the gap between the technology developed at the research institutions and its adoption at the field level by the farmers through demonstration of technology/products etc. and[6]

[6] *Ibid*.,

training of farmers, rural youths and extension personnel. On the basis of "India-2022", there were 578 rural districts spread over the country and this figure has further been raised to 602 districts, it is agreed to have one KVK in each district by the end of X^{th} plan. Realising the importance of technology assessment, refinement and transfer, the Planning Commission has allocated Rs. 500 Crores specifically for the establishment of new KVKs during Xth plan period. The DDG (AE) during the 11^{th} EFC meeting of Xth plan, held in New Delhi on 30^{th} September, 2003 outlined the importance of two issues in the context of the present scenario of agriculture in India- (i) the technologies have to be assessed and refined before their transfer and (ii) a programme approach involving various technology components relevant to the farmers in varying situations will be required for a perceptible change. The concept of technology assessment and refinement is based on participatory mode ensuring greater scientists-farmer linkage and access to agricultural technologies generated by research systems to the farming community. For this, the role of KVKs is of immense importance for overall agricultural and rural development through its various research and technology transfer mechanisms.

KVKs are controlled and coordinated by Agricultural Technology Application Research Institute (ATARI) which is a Coordination Unit for Transfer of Technology. Presently, there are 11 ATARI zones throughout the country.[7]

2.4. Principles of KVK

The basic principles for KVKs as enunciated by the Mehta Committee (1973) are:

a) Accelerating, agricultural and allied productions in the operational area of the Kendra should be the prime goal.

b) Experiential learning i.e. "Teaching by doing" and "Learning by" should be the principle methods of imparting skill training. The Kendra will impart learning through work experience and hence will

[7] *Ibid.,*

be concerned with technical literacy, the acquisition of which does not necessarily require the ability to read and write.

c) The Kendra will impart training to those extension workers who are employed and to the practicing farmers and fishermen. Training effort should not be made to make economically good people better but the poor ones good so as to raise the living conditions of the poorest the poor.

d) The syllabus and programme of each Kendra will be flexible in nature and tailored according to the felt needs, natural resources and the potential for agricultural growth in that particular area. That means there will be no uniform syllabus for the Kendras.

2.5. Components of KVK

The important Components of KVK are:

Vision: Science and technology-led growth leading to enhanced productivity, profitability and sustainability of agriculture.

Mission: Farmer-centric growth in agriculture and allied sectors through application of appropriate technologies in specific agro-ecosystem perspective.

Mandate: Technology Assessment and Demonstration for its Application and Capacity Development.

2.6. Unique features of KVK

Firstly, KVK brings the technologies from research organisations to the farmer's field.

Secondly, KVK is an organisation of multidisciplinary scientist and tries to develop an area from possible aspects of agriculture and allied with the help of its multidisciplinary team.[8]

[8] Mishra, J. P. (2016), *Agriculture and Farmers Well-being*: *Present Scenario*, New Delhi: Lancer Publishers & Distributors, p.4-6.

Thirdly, KVK enjoys strong technology support from host institutes and other research organisations.

Fourthly, KVK or the Farm Science Centre is a media which takes science from the research systems to the farmers' door after assessment and refinement.

Fifthly, Agriculture is always considered as a system, which encompasses several allied disciplines. KVK stands unique in respect to other institutions being working on system approach with core team of multidisciplinary scientists (working modules of KVK: team or group approach).

Sixthly, KVK act as hinge between different developmental agencies or organisations (private or public), financial institutions, NGOs, Cooperatives and farmers, farmers group in implementing different developmental activities intended for socio-economic upliftment.

Seventhly, KVK acts as knowledge centre in the rural areas in every fact i.e. addressing, disseminating knowledge on natural resource conservation, climate or ecological changes, agriculture and environment, human diet – health – disease prevention, zoonosis, impart analysis of developed technologies, ICT in agriculture, intelligent purchasing etc.[9]

2.7. Mandates and Activities

In the beginning, the mandate of KVK was only to provide skill based training to the farmers, farm women and rural youth in the field of agriculture and allied. During the VIIIth Five Year Plan, the mandates of the KVK was reviewed and revised to take up on-farm testing, long term vocational training, in service training or grass root extension workers and frontline demonstrations on major cereal, oilseed and pulse crops and other enterprises. The revised mandates of KVKs are:

Firstly, On-farm-Testing to assess the location specificity of agricultural technologies under various farming systems.

Secondly, organisation of Frontline Demonstrations to establish production potential of technologies on the farmers' fields.

[9] *Ibid.,*

Thirdly, capacity development of farmers and 'extension personnel' to update their knowledge and skills on modern agricultural technologies.

Fourthly, to work as knowledge and resource centre of agricultural technologies for supporting initiatives of public, private and voluntary sector in improving the agricultural economy of the district.

Fifthly, provision of farm advisories on varied subjects of interest of farmers by using ICT and other means of media.

Sixthly, organisation of training to update the extension personnel with emerging advances in agricultural research on regular basis.

Seventhly, organisation of short and long-term vocational training courses in agriculture and allied vocations for the farmers and rural youths with emphasis on "learning by doing" for higher production on farms and generating self-employment.

Eighty, prompt demonstration of the latest agricultural technologies to the farmers as well as extension workers of State Departments of Agriculture, Horticulture, Fishery, animal Science, NGOs with a view to reduce the time lag between the technology generation and its adoption.

Ninthly, testing and verification of technologies according to the socio-economic conditions of the farmers with a view to study the production constraints and to modify the technologies to make them appropriate**.**

Tenthly, to backing up of training and communication supports to the district level development departments viz; Agriculture, Horticulture, Fisheries, Animal Science and NGOs in their extension programmes.[10]

2.8. Objectives of KVK

The main objectives of KVK are the following:

1. To demonstrate new improved technology to the farmers as well as to the extension agencies directly in the farmers' field with their active participation.

2. To identify the technological and training needs of the farming community of the operational area. This may be carried out with the help of

[10] Chowdappa, P. *Op.cit.*, p.34.

Participatory Rural Appraisal (PRA) tools or conducting scientific survey, group interviews and personal visits.

3. To compile all relevant recommendations/package of practices for the district to be meaningfully utilized in the training programmes and the follow-up extension activities.

4. To plan and conduct production oriented and need based short and long duration training courses both on and off campus for various target groups.

5. Organising farm science clubs, both in rural schools and in villages in order to induce in younger generation a liking for and an interest for agricultural and allied sciences and scientific farming through supervised projects.

6. Developing and maintaining the campus farms and demonstration units on scientific lines as the facilities for providing work experience to the trainees and also disseminating the latest technical know-how.

7. Providing practical facilities of the Kendra to the teachers and the students of the vocational agriculture of the higher secondary schools.

8. Imparting some general education to rural illiterates and school drop-outs in order to make them not only good farmers but also better citizens.

9. Providing added training facilities in areas for home making and nutrition education for rural community.

10. Gradually enlarging the training facilities to encompass other important areas such as home crafts, cottage industries etc. consistent to the requirements of the Integrated Rural Development in collaboration with concerned organisation.

11. Implementing all such schemes of the ICAR and other related organisations which intend to strengthen the training programmes of the Kendra.[11]

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[11] Government of India (1990), *Manual of Procedures (Employment)*, Department of Agricultural Research and Education, Delhi, p.11-13.

12. Collaboration with the Subject Matter Specialist of SAU's, CAU's, Scientists of the REGIONAL RESEARCH STATION(NARP) and the State Extension Personnel in On-farm testing, training, refining and documenting technologies for developing region-specific sustainable land-use system.[12]

2.9. Role of KVK in Agricultural Extension

Research and extension has played a major role in increasing production and productivity in Indian agriculture and allied sectors in the past. Agriculture extension in India is largely controlled by the government organisations. KVKs are managed by both government and non-government organisations. Generally, KVK develops the knowledge base on agriculture and allied that is useful for the whole district. Indian agriculture is changing with time and situation at the advent of WTO regime and in the context of changing global agricultural scenario. Therefore, farmer needs to move with time and need to take different decision than the past. In this respect KVK functionary with its competent multidisciplinary Subject Matter Specialists supports farmer in decision making in the field of agriculture and allied. They help in proper utilisation of man-made and natural resources, diversification of agriculture system and adoption of need and market-based farming system. They develop and promote group or collective approaches and integration of farming systems to reduce the risk and educate them about trade, treaties and preparedness required for the change. Apart playing the role for agricultural extension, KVK plays other significant roles, those are:

a) In the eve of globalisation and hanging nature of agricultural system, KVK will assess and refine different technologies for farmers and assist them to choose the technologies to be adopted in their system.
b) Management of the new technologies at farmers' level and providing feed back to the research system for refinement.
c) Helps in proper utilisation of man-made and natural resources.
d) Diversification of agricultural system.
e) Adoption of Need and Market based farming system.[13]

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[12] *Ibid*.,

[13] Mishra, J. P. (2016), *Agriculture and Farmers Well-being*: *Present Scenario*, New Delhi: Lancer Publishers & Distributors, p.7-14.

f) Increasing the risk bearing capacity of farmers by popularising group or collaboration approaches and integration of farming systems.

g) Effective forward and backward linkages.

h) Protection of farmers' right and educating them about trade treaties and preparedness required for the change.

In the context of Mizoram, there are presently eight KVKs which are in operation. These are functioning within the eight districts viz. Aizawl, Kolasib, Mamit and Saiha. They are controlled and co-ordinated by ATARI Zone-VII, which is located at Barapani, Meghalaya.

2.10. Krishi Vigyan Kendras (KVKs) in Mizoram

There are 8 (eight) KVKs in the whole of Mizoram till date which are briefly discussed below:

2.10.1. Krishi Vigyan Kendra (KVK), Aizawl

The Indian Council of Agricultural Research has established 567 KVKs throughout the country to disseminate the latest Agricultural technical know-how and allied subjects developed by National Research Centre of ICAR Research Institute. It was felt that KVK would provide an integrated approach with the help of multi-disciplinary team of Scientists in the field of Agricultural Extension, Crop Production, Horticulture, Plant Protection, Fishery, Home Science, Animal Science and Allied Sector for Aizawl District to secure this purpose. KVK, Aizawl was sanctioned in 2005 under the wing of Central Agricultural University. This KVK actually started functioning from August 2008 after the recruitment of Technical and Office staff. Since then, KVK Aizawl is progressing to fulfil the mandates of KVK for benefiting the rural and progressive farmers of the districts.[14] The focus areas and road map of KVK Aizawl are:

1. Study of the area with the help of different statistical tools like Participatory Rural Appraisal (PRA), Rapid Rural Appraisal (RRA, group discussion, interview, personal visit, farm visit, etc.

[14] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

2. Study of indigenous technological knowledge and socio-economic status of farmer of the district.
3. Development of farmers' database.
4. Development of extension literatures like newsletter, leaflet, pamphlet, posters, diagram, flip chart, flash card, bulletin board etc.
5. Training infrastructure development of the KVK such as library, training hall, demonstration unit and information unit.
6. Development of participatory training approach modules based on the local situations and needs.
7. Laboratory infrastructure development of the KVK for testing soil, water, seed, plant, etc.
8. Conducting On Farm Trial (OFT) to assess the suitability of the technologies.
9. Conducting front-Line Demonstration (FLD) on proven technologies for generation of production data and feedback information.
10. Training and demonstration for increasing production and socio-economic improvement.
11. Adopting progressive farmers at different localities to set examples within the farming community.
12. Identification and selection of the potential crops in the field of agriculture and allied for the district.
13. Infrastructure development for production of quality planting material, seed, etc.
14. Adaptive research (OFT) on various crops in the field of agriculture technology and generation of production data and feedback information.
15. Identification of insect pests, diseases, etc. and their preventive measure in the field of agriculture and allied.

16. To select, demonstrate, promote viable eco-friendly agricultural techniques for managing nutrients, pests, diseases and wees for better productivity.[15]

2.10.2. Krishi Vigyan Kendra (KVK), Kolasib

Kolasib town is located at a distance of 83 km to the north of capital city of Aizawl and 100 km from Silchar, Assam and Krishi Vigyan Kendra, Kolasib District is located at a distance of 1.5 km from the main town. The total land holding of the Centre is 25.20 ha which is situated at 2 km away from the Kolasib town. Krishi Vigyan Kendra (Farm Science Centre), a noble concept developed by Indian Council of Agricultural Research (ICAR) as primary links for the farmers to know about the agriculture technologies being generated by National Agricultural Research System, was established in the last part of 1977 and the activities of KVK were started from the year 1979-1980. The operational areas of KVK, Kolasib covers 2 blocks (Thingdawl and Bilkhawthlir) comprising of villages. KVK, Kolasib is launched jointly by ICAR and Mizoram State Government for innovation of technology in the institution and research centre and then transfer to the farmers filed in the large interest of the farmers and agriculture production. The thrust areas and road map of Krishi Vidya Kendra (KVK) Kolasib are:

1. Jhum intensification through advance technology for sustainable agriculture.
2. Introduction of quality seeds and planting material.
3. Introduction of High Yielding Varieties (HYVs) for field crops.
4. Popularisation of rain water harvesting structures in upper ridges for life saving irrigation of high value crops and for maintaining animal farms.
5. Popularisation of integrated fish farming and mushroom cultivation.
6. Popularisation of medical & aromatic plants, tuber crops and edible bamboo.[16]

[15] Ibid.,
[16] Citizens Charter of KVK, Mamit, Mizoram.

7. Introduction of Azolla-fish under WRC.
8. Introduction of nursery raising techniques and protective agriculture for vegetables.
9. Implementation of INM, IPM, IDM in various field and vegetable crops.
10. Introduction of agro-forestry systems with focus on citrus, passion fruits and pineapple.
11. Integrated Farming System approach.
12. Introduction of biofertilizers viz; Rhizobium, Azospirillum, Azotobacter, Blue Green algae (BGA), azolla.
13. Establishment of Agro-processing units.
14. Training and demonstration on scientific practices of Agriculture and allied sector.
15. Linkages with ICAR Institutes, Private Banks, NGOs, ATMA, Agriculture and allied departments.
16. Strengthening the market led extension channels and credit linkages.
17. Infrastructure development.
18. To survey and identify the potential areas of training, technology gap, constraints etc. in Kolasib District.
19. To identify and study the interest and basic needs of the farmers within Kolasib District.
20. To study the production system, cropping pattern or selection of crops suitable for various micro-climatic conditions.
21. To select, demonstrate, promote viable, eco-friendly agro-techniques for managing nutrient, pest, diseases, weeds and crop production system through natural resource base maximising productivity.
22. Trials and demonstration on high yielding and disease resistant crop varieties for increasing the agriculture productivity of the District.
23. Promotion of local entrepreneurs for agricultural and allied sector enterprise and creating marketing channels and credit linkages.[17]

[17] Ibid.,

2.10.3. Krishi Vigyan Kendra (KVK), Mamit District

The KVK was sanctioned in 2005 under the Directorate of Agriculture (Research and Education), Government of Mizoram, and it was formally inaugurated on 31st May, 2008 at Lengpui, Mamit District of Mizoram. The staff of the KVK was recruited freshly on May, 2008. The KVK has got two demonstration farms- one is located near the Office building and another one is 2 km away from the Office main building. Out of the total area under the KVK (27 ha), demonstration farm covers an area of 25 ha. Presently, it is performing its job fully and successfully with well-developed farms. The focus areas and road map of KVK, Mamit District are:

1. Study of the area with the help of different statistical tools like Participatory Rural Appraisal (PRA), Rapid Rural Appraisal (RRA, group discussion, interview, personal visit, farm visit, etc.
2. Study of indigenous technological knowledge and socio-economic status of farmer of the district.
3. Development of farmers' database.
4. Development of extension literatures like newsletter, leaflet, pamphlet, posters, diagram, flip chart, flash card, bulletin board etc.
5. Training infrastructure development of the KVK such as library, training hall, demonstration unit and information unit.
6. Development of participatory training approach modules based on the local situations and needs.
7. Laboratory infrastructure development of the KVK for testing soil, water, seed, plant, etc.
8. Conducting On Farm Trial (OFT) to assess the suitability of the technologies.
9. Conducting front-Line Demonstration (FLD) on proven technologies for generation of production data and feedback information.
10. Training and demonstration for increasing production and socio-economic improvement.[18]

[18] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

11. Adopting progressive farmers at different localities to set examples within the farming community.
12. Survey to study prevailing agricultural farming systems, agriculture enterprises, farming situations and farmers.
13. Identification of training needs, technological needs, production constraints of the area and their possible intervention requirements.
14. Collection of secondary data of the district and documentation of existing indigenous farming practices, production technologies and cropping patterns.
15. Meteorological study of the district in respect of agriculture.
16. Study of the soil and water and strategy development for its efficient use for more food supply.
17. Resource mapping of the district.
18. Identification and selection of the potential crops in the field of agriculture and allied for the district.
19. Infrastructure development for production of quality planting material, seed, etc.
20. Adaptive research (OFT) on various crops in the field of agriculture technology and generation of production data and feedback information.[19]

2.10.4. Krishi Vigyan Kendra (KVK), Champhai

KVK, Champhai was sanctioned by ICAR during the year 2002 under the Directorate of Agriculture (Research & Education) Aizawl, Mizoram. This KVK is located at Khawzawl town which is 45 kms before Champhai town in Aizawl-Champhai road. The foundation stone was laid by the Honourable Minister of Agriculture, Mizoram on 19th Dec, 2002 with office buildings and staff quarters constructed. The inauguration of KVK Champhai was done on 10th July, 2008 which came into effect from 5th Aug, 2008. Thrust areas and road map of KVK, Champhai are:

[19] Ibid.,

1. Creating awareness among the farmers about KVK, its functions and how it can be helpful for them.
2. Changing the knowledge, skill attitude and practices of rural people by spreading education and work experience.
3. Identification of the farming system, local cultivators, cropping system and indigenous production and work experience.
4. Collection and analysis of soil, water and plant samples for accurate and precise recommendation.
5. Promotion of organic farming in the district and certification of organic products.
6. Putting emphasis on cultivation of medical and aromatic plants.
7. Stress on Integrated Pest Management (IPM), Integrated Weed Management (IWM), Integrated Plant Nutrient Management (IPNM), Biotechnology and Water Management (WM).
8. Production and promotion of organic rich manures through Vermi composting and NADEO compost etc.
9. Identification of major insect pest and diseases that affect the crop and live-stock of the district.
10. Identification of local breeds and its improvement.
11. Study of the weekly and daily markets available in the district and international market potential (Myanmar border).
12. Stress on rain water harvesting, watershed development and technologies of soil and water conservation.
13. Collection and storage of agriculture data and meteorological data for crop and weather forecasting.
14. Collection of secondary data from various departments on population, area, density and other information related to agriculture.
15. Baseline survey of entire district and documentation of existing crops, traditional practices and farming systems.[20]

[20] Citizens Charter of KVK, Mamit, Mizoram.

16. Situational analysis of existing farming condition, crops rotations and identification, documentation of ITK's on Livestock health care management etc.
17. Collection and analysis of meteorological data, temperature, rainfall, humidity and their trends.
18. Selection and screening of various crops, weeds, pests and diseases affecting the livestock with their remedial measures.[21]

2.10.5. Krishi Vigyan Kendra (KVK), Lunglei

Krishi Vigyan Kendra (KVK), Lunglei District was established on 20th October, 1994. The Kendra started functioning in the year 2002 under the charge of the Principal, Integrated Training Centre along with the Integrated Training Centre. However, on 14th July, 2008, the KVK started functioning as a separated establishment with the Programme Co-ordinator as the overall Coordinator of the Kendra and new staff were also recruited on 2nd July, 2009. Since then, KVK Lunglei has been functioning as an Innovative Science based Institution to impart Vocational Skill Training to the farmers and Field Level Extension Workers. The thrust areas and Road Map of KVK, Lunglei are:

1. Situational analysis of existing farming condition, crop rotation and identification, traditional practices and farming systems.
2. Collection and analysis of meteorological data, temperature, rainfall, humidity, and their trends.
3. Selection and screening of various crops, weeds, pests and diseases affecting the livestock with their remedial measures.
4. Introduction of nursery raising techniques and protective agriculture for vegetables.
5. Implementation of INM, IPM, IDM in various field and vegetable crops.

[21] *Ibid.,*

6. To survey and identify the potential areas of training, technology gap, constraints etc. in Kolasib District.
7. To identify and study the interest and basic needs of the farmers within Kolasib District.
8. To study the production system, cropping pattern or selection of crops suitable for various micro-climatic conditions.
9. To select, demonstrate, promote viable, eco-friendly agro-techniques for managing nutrient, pest, diseases, weeds and crop production system through natural resource base maximising productivity.
10. Trials and demonstration on high yielding and disease resistant crop varieties for increasing the agriculture productivity of the District.
11. Promotion of local entrepreneurs for agricultural and allied sector enterprise and creating marketing channels and credit linkages.
12. Provision of clinical assistance and management of livestock including cattle, piggery and poultry.
13. Popularization of Integrated fish farming and mushroom cultivation.
14. Linkages with ICAR Institutes, Private Banks, NGOs, ATMA, Agriculture and allied departments.
15. Development of participatory training approach modules based on the local situation data and feedback information.
16. Identification of training needs, technological needs, production constraints of the area and their possible intervention requirements.
17. Collection of secondary data of the district and documentation of existing indigenous farming practices, production technologies and cropping patterns.
18. Adaptive research (OFT) on various crops in the field of agriculture and generation of production data and feedback information.[22]

[22] *Annual Report of Krishi Vigyan Kendra*, Mamit District, 2022-23.

2.10.6. Krishi Vigyan Kendra (KVK), Serchhip

KVK, Serchhip, was sanctioned in the year 2005 and established in the year 2008. The office is located at N. Vanlaiphai which is about 65 kms from the District Headquarters, that is, Serchhip. Most of the infrastructural developments have been completed and occupied with the exception of Administrative building and Farmers' Hostel which still requires furnishing and is yet to be occupied. Recruitment of staff began from March, 2008 and most of the sanctioned post is now occupied. The focus area and road map of KVK, Serchhip.

1. Replacing the long duration Kharif paddy varieties with short duration HYV so as to encourage double/multi cropping system.
2. Promotion of System of Rice Intensification (SRI).
3. Conducting OGTs and FLDs for assessment / refinement of technologies.
4. Organise training for farmers, rural youth, and extension functionaries.
5. Formation of Self-Help Groups (SGHs).
6. Participate in Radio Talks, TV Talks, etc. and publish articles in newspapers.
7. Publication of Newsletters, Leaflets, Pamphlets, etc.
8. Organise Kisan Mela, Kisan Gosthi, and Exhibition, etc.
9. Organise Field Trips or Exposure Visits of Farmers, rural youth, extension functionaries.
10. Conduct Vaccination and Animal Health Camp.
11. Infrastructure Development.
12. Documentation of Exiting Farming System.
13. Database generation in Agriculture and Allied Sectors.
14. Conservation and development of bio-resources of the district.
15. Development of market linkage and value addition.
16. Sustainable development suitable for the area through OFTs and demonstrates such technologies through FLDs.
17. Asses technology suitable for the area through OFTs and demonstrates such technologies through FLDs.

18. Training and skill impartation to the farmers.
19. Establishment of nurseries for production of quality seeds and planting materials.
20. Provide appropriate agro-techniques for cultivation of commercially viable produce.
21. Identify suitable machineries to the existing farming system of the district.
22. Credit linkage of farmers to financial institute.
23. Identification of insect-pest effecting crops and livestock with their remedial measures.
24. Promotion of Organic cultivation in the district.
25. Promotion of hybrid maize cultivation, QPM and Baby corn varieties in the district.
26. Development of Integrated Farming System Model in the District.
27. Promotion of low cost rain water harvesting structures.
28. Promotion of protective cultivation, low cost greenhouse / rain shelters for off-season cultivation.
29. Collection, selection and screening of the local varieties of crops particularly rice.[23]

2.10.7. Krishi Vigyan Kendra (KVK), Lawngtlai

KVK Lawngtlai is one of the youngest KVKs in NE India. The Kendra was inaugurated on 5th August, 2008. The host organization is Directorate of Agriculture (Research & Education), Government of Mizoram. It is located at a beautiful hill of Chawnhu Village, about 2.5 km from Lawngtlai town, capital of Lawngtlai District. From the KVK complex, there is a good panoramic view of the mighty Blue Mountain (Phawngpui), the highest peak of Mizoram (2157 metres) on the northeast side and a scenic view of Saiha town and the neighbouring KVK, Saiha District on the eastern side.

[23] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

1. Horticulture: In view of the proposal of inland waterway from Hruitezawl (Lawngtlai District) to Akyap (Myanmar) Sea Port, it is felt necessary to exploit the land resources especially under horticulture sector so as to enhance exporting the produce to foreign countries and thereby uplifting the economic condition of the district. Provision of high-quality seeds, Training on post-harvest technology, Plant protection measures, Orchard management, Processing and value addition of produce.

2. Agro-Foresrty: Integrated farming system approach is given one of the priorities. About 19.25% of the total geographical area of the district has been considered as potential area for the development of the integrated farming system. Massive scale introduction of Agroforestry farming system approach can bring about a drastic change in the economy of the farmers of the district.

3. Integrated Pest Management (IPM) Approach: Another thrust area of KVK Lawngtlai District is popularization of IPM concept as the awareness of the farmers in regard to IPM approach is still minimal.

4. Veterinary: Training on production of feeds, rearing of upgraded breeds, provision of clinical assistance.

5. Fishery: Provision of fish feed, provision of fish seeds, training on integrated fish farming, composite fish culture.

6. Organic Farming and Certification: The Kendra is maintaining one organic farm where in banana, Assam lemon and vegetables are grown in an area of 2 hectares under the guidance and supervision of One Cert Asia, Jodhpur as a pilot project.

7. Socio-Economics Services/Home Science: The Kendra provides training on women and child care, income generating activities, value addition.

8. Agril. Marketing: Another thrust area is study, identification of marketing channels of agricultural produce.

9. To study, identify and utilize ITK (Indigenous Technical Knowledge).[24]

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[24] *Annual Report of Krishi Vigyan Kendra*, Mamit District, 2022-23.

2.10.8. Krishi Vigyan Kendra (KVK), Saiha

The KVK at Saiha District is located at Siahatlangkawn, the outskirt of Saiha town and started functioning since April, 2008 which was inaugurated by the Hon'ble Minister of Agriculture, Mizoram on 6th august, 2008 under the directorate of Agriculture (Research & Education), Government of Mizoram.

The KVK at Saiha District is co-ordinated by the Zonal Co-ordinating Unit, Zone-III under the Indian Council of Agriculture Research (ICAR), Barapani, Meghalaya. Since its inception, the KVK has been engaged in carrying out detailed survey in agriculture and allied sectors and also conducting need based trainings and demonstration to the farmers. In addition to aforesaid thrust areas and road map of the Kendra, the focus areas of KVK, Saiha are:

1. Provision of clinical assistance and management of livestock including cattle, piggery and poultry.
2. Promotion of fodder cultivation and sustained availability of animal feed.
3. To motivate the farmers for commercial cultivation of field as well as horticultural crops.
4. To popularise the high yielding varieties as well as package of practices of field crops as well as horticultural crops.[25]
5. To minimize the post-harvest losses in fruits and vegetables by preservation.
6. Constituting of SHGs for seed production and their involvement in delivery system.
7. Promotion of composting for soil fertility replenishment.
8. Value addition of local produce locally for income enhancement.
9. Popularisation of mushroom cultivation.
10. Developing and maintaining farms and demonstration units on scientific lines to facilitate work experience to the trainees and also to put a show case of latest technical know-how.

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[25] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

11. Collecting feedback from the farmers and extension agencies and communicating these messages to research scientist for modification of technology.
12. Farming system analysis, documentation of the existing farming practices and socio-economic status of the district problem and needs identification.
13. Infrastructural development: library, training hall, networking, demonstration and instructional farm development and establishment of agri-clinic.
14. Conducting of OFT and FLD for technology assessment and refinement for feedback and feed forward.[26]

2.11. Conclusion

The origin, growth, concept, principles, components, mandated activities, objectives and roles discussed above inferred that KVKs were evolved basically to cater the needs of the farming community of the country.

[26] Ibid.,

CHAPTER – III

ORGANISATIONAL STRUCTURE OF KRISHI VIGYAN KENDRA, MAMIT DISTRICT

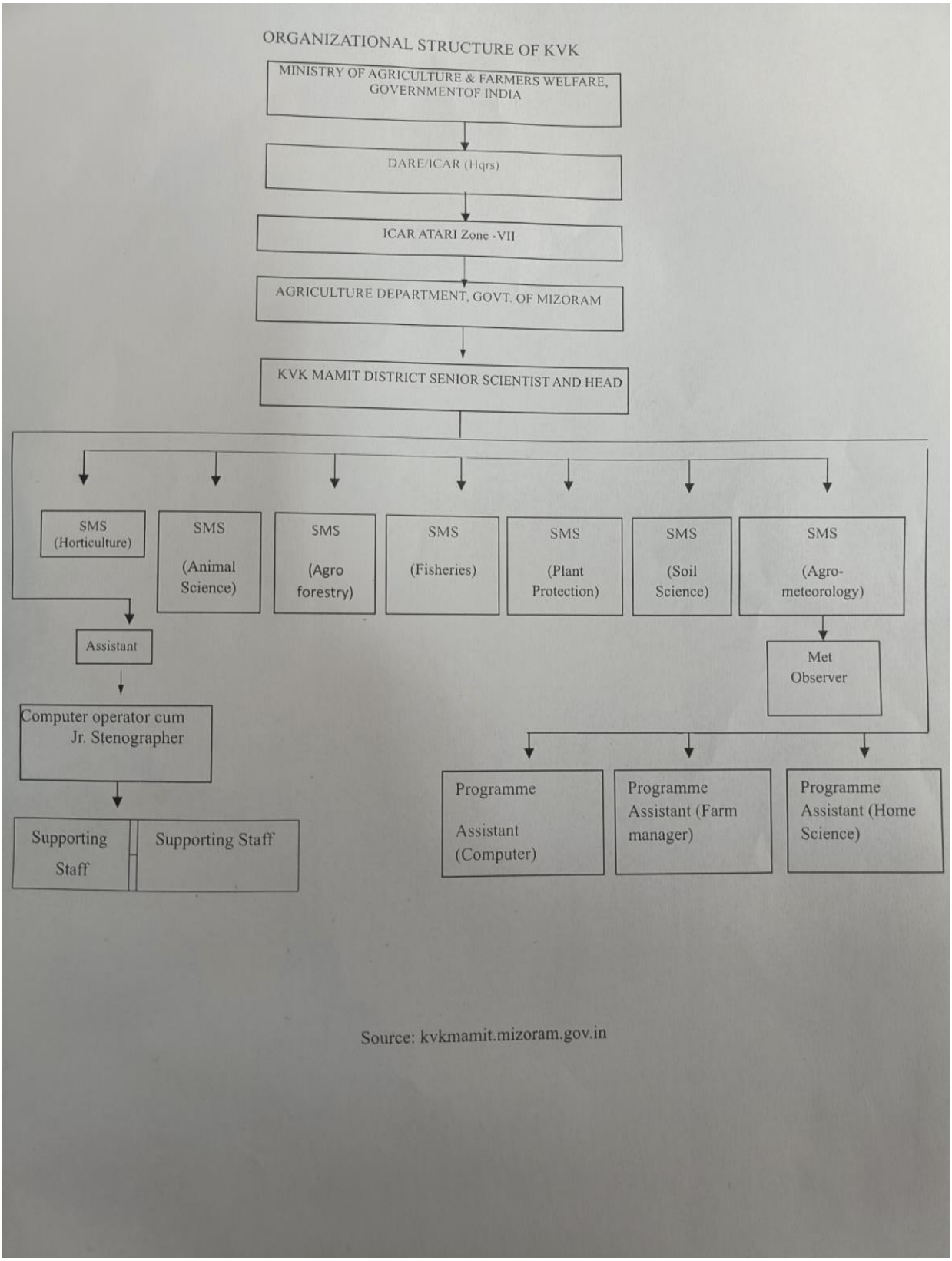
3.1. Introduction

Organisational Structure of any institution is determined by the functions and role it has to perform. Therefore, the strength and weakness of the institution or Centre greatly depends on the organisational structure carefully designed with reference to role and functions it has to perform. In this Chapter, an attempt has been made to study the organisational structure and the scheme of hierarchy of KVK, Mamit District.

3.2. Organisational Structure of KVK, Mamit District

The following figure shows the organisational structure of KVK, Mamit District with emphasis on functions and role of the officers and staff of the Centre.

Fig.3.1: Organisational Structure of KVK, Mamit.



3.2.1. Agriculture Department of Mizoram as the Host Institute

The Department of Agriculture in Mizoram started functioning as a full-fledged Department in the year 1972 when Mizoram was accorded the status of Union Territory. Since its inception in 1972, the Department has evolved and established itself over four decades. Earlier, the Department of Agriculture was divided into two Directorates, namely Directorate of Agriculture (Crop Husbandry) and Directorate of Agriculture (Research and Education). The two Directorates had separate functions and organizational setups under the overall control of their respective Directors. Accordingly, technical and administrative personnel of the State Agriculture Department were organizationally and administratively divided under the two Directorates- Crop Husbandry (CH) and Research and Education (R&E). The Directorate of R&E was responsible for administration of activities pertaining to agricultural research and education including running of Training Centre and Agricultural Farms and Institutes. On the other hand, the Directorate of CH can be considered as the main establishment which administers the physical implementation and execution of all agricultural schemes and programmes. Since, December 2020, the two separate Directorates had been amalgamated and are presently serving as the Host Institute for KVK, Mamit. As a Host Institute, it co-ordinates and administering the works of KVK in accordance with the rule based instructions prescribed by the Central and the State Governments. Through Public Finance Management System (PFMS), the Host Institute releases the necessary funds for the management and smooth functioning of KVK, Mamit Centre.[1]

Host organization must have the pride of ownership and possessiveness of KVKs which are meant for helping the farming community in Mamit District. Therefore, the following recommendations are made to inculcate a sense of belongingness among the host organizations towards KVKs:

- Available financial provisions of ICAR shall be supplemented by the host organizations to develop the KVK infrastructure in such a way that the farm

[1] Government of Mizoram (2011), *Facilities and Benefits to Farming Community*, The Synod Press, Mission Veng), Aizawl.

is a miniature of the agro-climatic situation of the district with representation of major crops and enterprises.

- Investment and effective involvement should come from the top leadership in host organization for implementation of activities of KVKs.
- Promotion of interface in different blocks and villages of the district build a communication strategy by involving innovative and progressive farmers and other stakeholders for enhancing awareness towards KVK.[2]

3.2.2. Indian Council of Agricultural Research (ICAR) as Monitoring Agency for KVK

Indian Council of Agricultural Research (ICAR) monitors the activities of KVK during State and Zonal Workshop which are being conducted by Zonal Project Director (ZPD) after the completion of each financial year. The Progress Report of the year under report and the Action plan for the coming year are being discussed at length during the meeting. ICAR has formed an Expert Committee for this kind of Workshop with Directors of Extension and Education of various SAUS, Scientists from ZPD's Unit and Representative from ICAR's Headquarters at Delhi. Funds are being allocated to the Centre after meticulously scrutinizing all the activities. Besides, KVK, Mamit Centre, is required to submit Monthly Report to ZPD of ATARI Zone 7, Barapani, Meghalaya, within fifth of every month. As the Centre is to serve the farming community of district, ICAR has framed a Guideline for holding Scientific Advisory Committee meeting at least once in a year with all representatives of Line Departments, SAUs, ICAR as well as farmers from KVK's adopted villages to fine tune KVK's activities and Action plan. Normally Scientific Advisory Committee meetings are being held immediately after Zonal Workshop of ICAR to facilitate finalization of Action Plan for the forthcoming year.

Krishi Vigyan Kendra (KVK), Mamit district is an institutional project of the ICAR to demonstrate the 'Application' of science and technology input of agricultural research and education on the farmers field and in the rural area with the help of a multi-disciplinary team of scientists. It was established in the year 2008 and

[2]Ibid.,

the office is located at Lengpui which is about 35 kilometres from the capital city i.e. Aizawl. It is 100% funded by Ministry of Agriculture and Farmers Welfare, Government of India through ICAR Hqrs. New Delhi. ICAR Hqrs. released fund through Public Finance Management System (PFMS) to Indian Council of Agricultural Research (ICAR) (ATARI ZONE7) Barapani, Meghalaya. Thereafter, ICAR (ATARI) released the fund to Agriculture Department, Government of Mizoram, which is then released to KVK, Mamit District.

KVK, Mamit is being 100% financed by Indian Council of Agriculture Research in respect to Pay and Allowance, Travelling Allowance, Office Contingencies and Carry out On Farm Trials, Front Line Demonstrations, and Trainings. ICAR is also rendering full financial help to develop infrastructure facilities viz. Administrative Building, Soil laboratory, Training Hostel, Vehicles. Besides, as per demand and necessity, grants are being provided to develop further infrastructure facilities as and when required.

The office of KVK is headed by a Senior Scientist and Head, erstwhile known as Programme Coordinator. The essential qualification that he has to acquire is a Doctorate Degree in any agriculture discipline. There are seven technical disciplines under his control and supervision namely Animal Husbandry, Plant Protection, Fisheries, Agro Forestry, Soil Science, Horticulture and Agro-Meteorology. Each of the disciplines is handled by Subject Matter Specialists also designated as Scientists. The essential qualification required for each discipline is a Master Degree in the aforementioned relevant subjects. Apart from these, there are two other technical sanctioned posts viz. Farm Manager and Programme Assistant (Home Science) and the minimum educational qualification required for these two posts are at least a graduate in Agriculture, that is, B.Sc. (Agri.) and B.Sc. (Home Science) respectively. The total official strength of the Centre is 17.

In addition to these, non-technical staff, such as one Assistant, one Programme Assistant (Computer), one Computer operator-cum-Jr. Stenographer, two

drivers and two Supporting Staff, are also sanctioned in the office of KVK, Mamit District.[3]

3.2.3. Administrative, Functional and Collective Roles and Responsibilities of the Staff of KVK

1. KVK Mamit plays a role in showcasing the frontier technologies, capacity building among stakeholders, and frontrunner in technological application, information and inputs, participatory approaches in planning, implementing, executing and evaluation. However, for meeting new challenges it is important to focus on conservation of natural resources, achieving higher productivity, keeping sustainability of agriculture, enhancing farmers income through bringing in farming to market value chain efficiency.
2. Technology Assessment and Demonstration for its Application and Capacity Development. To implement the mandates effectively, the following activities are envisaged for the Centre. (a)- On-farm testing to assess the location specificity of agricultural technologies under various farming systems. (b)- Frontline demonstrations to establish production potential of technologies on the farmers' fields.
3. Capacity development of farmers and extension personnel to update their knowledge and skills on modern agricultural technologies.
4. To work as Knowledge and Resource Centre of agricultural technologies for supporting initiatives of public, private and voluntary sector in improving the agricultural economy of the district.
5. Provide farm advisories using ICT and other media means on varied subjects of interest to farmers.
6. Appropriate follow up action with respect to the suggestions made by Director, ATARI, other ICAR officers, Director of Extension and experts from SAUs during their visits.

[3] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

7. Coordinating the activities of the Centre and to establish appropriate linkages and coordinate with the line department and Agri- Research Stations in the district.
8. The Senior Scientist and Head is the Drawing and disbursing officer and the operation of the budget falls under his jurisdiction.
9. Organize Scientific Advisory Committee (SAC) meetings to finalize action plans and development of the units.
10. Timely submission of reports and returns to the university and to the Director, ATARI. Document should be supported with good photographs and video clipping of farmers Innovation, Indigenous Technological Knowledge ITKs identified in the district on yearly basis and report to the Director, ATARI & Director Extension for National level documentation.
11. The following reports should also be submitted to Director ATARI with a copy to Director of Extension Monthly physical and financial progress report. Quarterly and Annual reports (Physical, Financial) in a prescribed format for a given financial year on or before 30th April of every year. Seasonal reports on externally funded project – Cluster Frontline Demonstration (CFLD), Attracting and Retaining Youth in Agriculture (ARYA), Farmers FIRST of ICAR may be submitted in the preliminary information soon after the selection of farmers and final reports after the completion of programme in the prescribed format.
12. Quarterly and half yearly meeting to review the on-going activities and future course of action and submit the proceeding to the concerned Director of Extension and Director ATARI.
13. Conducting ex-trainees meeting for getting feedback for impact assessment at technology intervention perused through OFT, FLD and training and document the assessed and refined technologies through OFT.
14. Latest technological updates and KVK events or alerts should be sent to and other stakeholder through KVK mobile advisory and KVK portal and short video clippings, success stories, case studies should be prepared and posted[4]

[4] *Field study.*

on KVK website. Managing conflicts, if any affecting efficient functioning at the Centre.

15. Conduct village and family survey using PRA tools and critically assessing the technological gaps and training needs of the farming communities in their respective subject.
16. Planning formulating and conducting need based relevant vocational and other training courses for youth and farmers based on the recommendation of SAC meeting, equipping their sections with appropriate practical training facilities and equipments.
17. Developing suitable extension literature in local language in the interest of farmers and extension functionaries. Maintaining farms and animals on commercial levies as the training resources and keeping on evaluating their day-to-day performance in offering effective programmes. Also, organizing field demonstration and providing advisory services.
18. Maintaining the professional relationship and functional agencies in their respective fields through Head of the office. Identifying thrust area and select interest and need based farmer group for skill training for entrepreneurship development, providing improved seeds, plants and animals to the local farmer and young entrepreneurs or assisting then to acquire the same from the right sources or agencies, and organizing field days, farms visit, Kisan Mela and group discussion.
19. Develop and update information Centre at KVK. Organizing skill and production oriented short and long duration training programme both on and off campus for practicing farmer and field level extension workers. Timely reporting of the results of technical programme of work and feedback.
20. Laying out demonstration unit of the different disciplines at the KVK farms with improved management practice to use it as resource for training the trainees and for economic gain. [5]

[5] *Field study.*

21. Maintaining farm on commercial lines and establishing demonstration units, and Technology Park comprising crop bases and other enterprises. The units should demonstrate the potential of the new technology and be cost effective.
22. Develop the technology cafeteria at instructional farm showcasing technologies, practices and units suitable for the district as models for learning.
23. Keeping the farm demo units in ideal and good conditions and planning the farm activities well in advance and executing the same in proper manner. Maintaining all relevant farm record like (i) Daily memorandum sheet (ii) Permanent Stock register (iii) Input Stock register (iv) Farm Indent register (v) Tractor log book (i) Farm expenses (vi) Farm Produce register
24. Maintaining forecast register and reporting weather data and crop condition to the farmers and also seeking technical advice from other allied functionaries like ATMA.
25. Ensure timely submission of reports regarding the farm activities to the concerned allied functionaries for seeking technological advice for specific crop or other problems.
26. Responsible for mobile soil testing laboratory, seed processing unit and other laboratory work. Preparation of technical reports and compilation and forwarding of primary technical data from the lab and feedback information on various aspects.
27. Assisting scientific personnel from different allied functionaries or departments, demonstration of package of practices for application of research findings in the field. Maintenance of technical files, records and responsible for transfer of technologies identified for the area, supervision of farmers by using the extension tool and providing feedback on technologies and assisting farmers in improving the production.
28. Timely reporting of the technical programme of KVK work through E-Mail to director ATARI and director of extension. [6]

[6] *Field study.*

29. Planning and conducting surveys of the operational area to inventories and characterize physical and human resources with special reference to identifying the technological gaps and training needs of the farming community.
30. Planning various need based activities to overcome the farming problems.
31. Process mapping of various activities and implementation of trainings based on 7 steps cycle.
32. Developing and maintaining the campus farms and demonstration units in scientific and systematic manner.[7]

(A) Senior Scientist and Head

The Senior Scientist and Head looks after the overall management of the establishment of the office and is in charge of overseeing experiments and evaluating the scientists' performance, especially in laboratory settings. Moreover, it is also his responsibility to assess every progress report to ensure its accuracy and validity. The main roles of Senior Scientist and Head have been highlighted below:

1) To coordinate, control and supervise the overall functioning of the Centre.
2) Keeping the head of the host institute i.e. Department of Agriculture, Government of Mizoram well informed about the Centre.
3) Developing the needed infrastructure most consistent to the rural environment and needs of the district.
4) Developing annual and five yearly programmes to their effective implementation.
5) Effective working and utilization of Scientific Advisory Committee (SAC) of the KVK.
6) Developing functional linkages with related institutions and agencies.
7) Effective management of farms, workshops, animals and other training resources.
8) Taking all possible measures for development of the staff on-job regular training and guidance to build the staff.

[7] *Field study.*

9) Maintaining constant and harmonious relations with ICAR-ATARI headquarters and conforming to its norms.
10) Evaluation and supervision of the day to day works of the Kendra.
11) Planning and conducting special training courses in his or her area of specialization, thus setting example before other KVK staff.
12) Participating in the recruitment of the staff.
13) Any other duties assigned by the head of the host institute in the best interest of Kendra.[8]

(B) Role of Subject Matter Specialist (SMS)

The Subject Matter Specialists are engaged in generating the knowledge, testing the technology, developing innovations and on the other hand, in communicating knowledge, technology and innovations directly or indirectly to the farmers and extension workers. The Subject Matter Specialists seek to reach the farming community through different extension teaching methods by giving proper treatment to technological massages. The following are the duties of SMS:

1. Conducting village and family survey and critically assessing the technological gap and training needs of the farming communities in their respective subjects.
2. Planning, formulating and conducting relevant training courses.
3. Equipping their section with appropriate practical training facilities and equipments.
4. Developing suitable extension literature for training facilities.
5. Keeping evaluation of training and other day to day works.
6. Selection of farmers for training and other extension functionaries.
7. Maintaining demonstration unit as training resources.
8. Organising field day, field demonstration and providing field advisory services.
9. Maintaining linkages with other development agencies.
10. Providing input, seed material, animal to the trainees to the farmers.

[8] *Annual Report of Krishi Vigyan Kendra*, Mamit District, 2022-23.

11. Any other duties assigned by the Senior Scientist and Head.

3.3. On Farm Testing (OFT) – This is to test and evaluate the research findings of Research Stations at the farmer's field and to refine and modify the technologies, if required for better adoption by farmers. It is confirmation of already proven research results under real farming situation.

This is to test and evaluate the research findings of Research Stations at the farmer's field and to refine and modify the technologies, if required for better adoption by farmers. It is confirmation of already proven research results under real farming situation. KVK Mamit carries out on farm testing for location specific sustainable innovative technologies. All On Farm Trials are being conducted thrice in different blocks of the district in consecutive years with an intention to refine technologies during the course of three years. Successful technologies along with normal conventional technologies of ICAR are being disseminated to farmers. It aims at assessment of location specific technology modules in agriculture and allied activities, through technology assessment, refinement and demonstrations.

3.4. Front Line Demonstrations (FLDs) – This is a unique approach to provide a direct interface between researcher and farmers as the scientists are directly involved in planning, execution and monitoring of the demonstrations for the technologies developed by them and get direct feedback from the farmers' field. Front line demonstration on different high yielding verities of Oil seeds and pulses, Wheat, Paddy, Potato, potential vegetables, fruits, flowers as per feasibility of the respective district, Poultry, Duck (Khaki Campbell), Goatary, Dairy, Fodder (Maize), Poly Culture of Fish & Prawn, Fish Feed, Paddy Puddler, Improve Implements, Kitchen Garden are being carried out through Farmers Club.[9]

The nature of responsibilities of each officers and staff are described as follows:

3.5. Subject Matter Specialist (Animal Science)

[9]Ibid.,

The Subject Matter Specialist carry out training programmes for promulgating latest scientific knowledge on Animal Husbandry. He conducts trial and research in the nutrition, reproduction, and development of domestic farm animals in order to formulate more efficient ways of producing and processing meat, poultry, eggs, and milk. To that end, he consult with agricultural producers (farmers) on how to provide healthy and safe housing for their animals; lower mortality rates and improve parasite and disease control; dispose of waste matter; and increase the production of animal products.

3.5.1. Other duties include:

a. He is also involved in the selection and breeding of animals to create new strains of animals with desirable characteristics.
b. He is also engaged in administering vaccines for domesticated animals such as poultry, pigs, dogs.
c. He also has a role in investigating and analysing various management practices, processing methods, feeding techniques, and environmental conditions to determine their effect on the quality and quantity of animal products.

3.6. Subject Matter Specialist (Plant Protection):

He conducts various training programmes on scientific plant protection measures and carries out On Farm Trails (OFT) and Front Line Demonstrations (FLD).He demonstrates safe use of insecticides, fungicides, weedicides, etc. to the farmers of the district. He study farm crops and develop ways to improve their quantity and quality and look for ways to improve crop yield with less labour, control pests, diseases and weeds more safely and effectively, and to conserve soil and water. Plant scientists also look for ways to use agricultural products for fuels.

3.7. Subject Matter Specialist (Fisheries):

He leads numerous training sessions on cutting-edge pisciculture techniques and conducts front-line demonstrations (FLD) and on-farm trails (OFT).

3.7.1. Major duties are as follows:

1. He is responsible for mobilizing members of the fishing community for extension training and other activities at community level.
2. He provides assistance in ensuring active community participation, identifying target group for the training and other community level activities.
3. He plays a vital role in the promotion of fish rearing, framing in the private and public ponds or lakes.
4. He figures out ways and solutions to increase the income of farmers and also advise farmers on fish rearing.
5. He is responsible for surveying fish stocks to ensure the correct type and amount of fish that are to be in the right places, conducting annual surveys of rivers, carrying out electro-fishing and netting activities and contribute to habitat improvement schemes.

Notable here is that KVK, Mamit is the only Centre amongst all the other KVK's in Mizoram to have a Fishery discipline.[10]

3.8. Subject Matter Specialist (Agro – Forestry):

In addition to doing On Farm Trails (OFT) and Front Line Demonstrations (FLD), she runs a variety of training programmes on scientific agro- forestry strategies. Develop strategy on agriculture, forestry and agroforestry and rural advisory services after conducting Participatory Rural Appraisal (PRA). She develops extension materials on sustainable agriculture, forestry and agroforestry for farmers. Other important roles of SMS (Agro – Forestry) are:

- Collaborate with multidisciplinary teams (including government, university, NGO, conservation and private sector partners) in designing, conducting studies, and analysing high quality agroforestry systems management to promote sustainable livelihoods in rural landscapes.
- Lead and facilitate engagement at the community level, particularly with farmers groups (including women farmer group) in promoting sustainable agroforestry systems to support the enhancement of local livelihoods.

[10] *Capacity Development and Targets* (2023), Krishi Vigyan Kendra, Mamit District.

- Lead and facilitate partnership development between local stakeholders including village government and farmer groups with government agencies and private sectors to support the enhancement of local livelihoods.
- Coordinate with the extension team (lead by the Agroforestry Extension Specialist) in developing training material related to agroforestry systems management.

3.9. Subject Matter Specialist (Soil Science):

She conducts numerous training programmes on scientific management of soil for enhancing crop productivity and carry out On Farm Trails (OFT) and Front Line Demonstrations (FLD).

Soil Science division deals with importance of soil and water testing, issue of soil health cards, soil suitability for agriculture, horticulture and soil fertility management strategies to the farming community. The major duties of soil scientist in KVK are as follows;

- Analysing soil samples to provide information about its quality and structure for agricultural purposes.
- To collect and test soil samples.
- To address particularly into these six areas:

(a) Land-based treatment of wastes like manure, food and fibre processing wastes, etc.

(b) Identification and protection of environmentally critical areas: Sensitive and unstable soils, unique soil situations that support optimum production.

(c) Management for optimum land productivity, such as nutrient management, water management, grazing, silviculture, etc.

(d) Management for optimum water quality

(e) Remediation and restoration of damaged lands

(f) Sustainability of desired uses which include soil conservation.[11]

[11] Ibid.,

3.10. Subject Matter Specialist (Horticulture):

He is specialized in plant identification and classification, and the growth and development of plants and crops including vegetables, fruits and ornamental plants. He helps farmers and agriculturalists cultivate plants and work with them, helping them improve their cultivation techniques. This could include boosting the amount of vegetation they harvest or giving higher resistance to disease or contamination.

His major roles are:

- Manage Crop Production: He oversees farms to ensure that farmers improve their crop yields. He also ensures that the crops are healthy and well-maintained.
- Perform Research: He performs research on plant evolution to better understand a plant's growth cycle, and conduct experiments to see how plants grow under various conditions.
- Create Crop Schedule: He works with farmers to create a crop schedule, which shows when a farmer should plant so that they can harvest at an appropriate time.
- Test Fertilities: He tests various mixtures of fertilizers to see which mixture is best for specific plants.
- Monitor Greenhouses: He monitors the plants within a greenhouse to ensure they receive the correct fertilizers and care.
- Operate Farming Equipment: He operates farming equipments, including tractors and fertilizer sprayers.
- Oversee Farming Staff: He oversees farming staff and provide instructions for crop production
- Consult with Farmers and Landscapers: From time to time, he consults with farmers and landscapers, where they can analyse their crop production and identity ways to improve the amount and quality of crops.

3.11. Subject Matter Specialist (Agro Meteorology):

The major duties and role played by the Agro- Meteorologist in KVK are:

(a) Helping farmers in forecasting pests and diseases, choice of crops, irrigation and other intercultural operations through short, medium and long-range forecasts.

(b) To study climatic resources of a given area for effective crop planning.

(c) To evolve weather based effective farm operations.

(d) To extend and fully deploy knowledge of atmospheric and related processes to optimize agricultural production, and hence to increase profitability, decrease risk, and feed an expanding global population.

(e) To regulate the animal cycle, i.e. growth, by-product and yield (milk, eggs and meat) and in designing animal houses. The houses for the animals can be designed scientifically to save the animals from various climatic stresses such as heat and cold waves which affect the production.

(f) To contribute to weather information based crop, livestock management strategies and operations dedicated to enhancing crop production in a sustainable manner.

(g) Responsible for the dissemination of agricultural meteorological advice, warning, forecast, bulletin and other important information needed by farmers.

The Agro – Met conducts training and supportive extension programmes to increase climate awareness among the farming community and to disseminate climate resilient technologies to increase farming resiliency to weather anomalies and hill agriculture profitability. Notable here is that KVK, Mamit is the only Centre amongst all the other KVK's in Mizoram to have an Agro-Met scientist and is the only Centre to establish an Automatic Weather Station (AWS). This can indeed be regarded as "a state of the art" for the whole district of Mamit and Mizoram as well.

Automatic Weather Station (AWS) was installed at KVK, Lengpui in 21st December, 2020.[12] This Automatic Weather Station (AWS) is used for real-time information on weather at the farm level. The AWS also provides information on soil

[12] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

moisture and soil temperature, giving better information on the irrigation requirement. Undoubtedly, AWS is a great tool in supporting the farmers.

3.12. Programme Assistant (Home Science)

The main motive of Home Science in KVK is to improve human environment, family nutrition, management of resources and food development by integrating the application of knowledge synthesized from different sciences and humanities. It aims to give scientific knowledge and develop skills for efficient performance of household responsibilities.

The Home Science division of the KVK deals with the postharvest technology for the fruits and vegetables. This division coordinates the women cell activities of the KVK. This section deals all women oriented programmes of the KVK with the aim of economic empowerment. It works as a catalyst in the growth of skill-based entrepreneurship in the processing sector, especially among women collectives. The division ensures that all those who are engaged in entrepreneurial activities related to food, nutrition and processing reap the best out of them all.

The different training programmes conducted under the division are:

- Post-harvest technology of fruits and vegetables.
- Low cost energy saving devices.
- Drudgery reduction.
- Floral arrangement and handicrafts.
- Value added milk products.
- Value added coconut products.
- Value added mushroom and tuber products.
- Income generation activities in agriculture.
- Household food security through nutri-garden.
- Enhancement of eco-safe technology for fruit and vegetable processing in rural and urban households using the local food chain.[13]

[13] *Ibid.,*

3.13. Programme Assistant (Farm Manager):

The Farm Manager supervises staff, monitor crops and animals, and handle various administrative tasks as per the directions given by the Senior Scientist and Head. They prepare budgets, purchase supplies, maintain relationships with vendors and clients, and ensure maximum profitability.

The main responsibilities are:

- Ensuring seeds, fertilizers, pesticides, and other supplies are regularly restocked. Scheduling repairs, maintenance, and replacement of equipment and machinery.
- Handling the marketing and sale of products produced on the farm like fruits, vegetables, dairy, meat, and grain.
- Making and implementing the decisions involved in organizing and operating a farm for maximum production and profit.
- Picking the appropriate pest control measures and demonstrating the methods to farmers how and when to apply fertilizers.
- Having a track of pest control activities and fertilizing which cuts down on labour and unnecessary expenditure.
- Helping farmers to stay on track and conduct farming activities in a more organized way.

Other responsibilities include:

- To plan finances and production to maintain farm progress against budget parameters.
- To undertake practical activities, such as driving tractors, operating machinery, feeding livestock or spraying fields.
- To arrange the maintenance and repair of farm buildings, machinery and equipment.
- To plan activities for trainee staff, mentoring and monitoring them.
- To maintain and monitor the quality of yield, whether livestock or crops.
- To understand the implications of the weather and make contingency plans.
- To make sure products are ready for deadlines, such as auctions and markets.
- To ensure that farm activities comply with government regulations.
- To apply health and safety standards across the farm estate.

- To protect the environment and maintaining biodiversity.
- To keep financial records up to date.[14]

3.14. Programme Assistant (Computer Programmer):

The Computer Programmer creates instructions for the computers to execute by writing and testing code that enables applications and software programs to operate successfully within the organization. He is in charge of maintenance of all the information technology related issues within KVK.

3.14.1. Duties and Responsibilities

- Creates and modifies computer programs based on project specifications.
- Collaborates with department heads, managers, and other stakeholders to fully understand the tasks that must be accomplished by the software requested.
- Designs, or assists with design of, graphical user interface (GUI) as needed.
- Collaborates with systems analyst to obtain and analyse project specifications and flow charts.
- Develops a flow chart of data input and potential problems that could emerge in a given environment; creates contingencies within the program for these possibilities, including error messages or alternate data flows.
- Tests programs; coordinates and observes beta testing of new or updated programs.
- Debugs or corrects any issues discovered during beta testing.
- Issues stable release.
- Analyses, reviews, and revises programs as needed to increase operating efficiency or adapt program to new requirements.
- Develops and maintains documentation of program development and revisions.
- Provides training to end users.
- Performs other related duties as assigned by the Head of the office.

[14] *Citizen's charter- KVK Mamit District*

- System design, software development, computerization, computer application and maintenance.
- Assist in developing KVK as a resource and knowledge Centre by generating the dynamic website as per the ICAR norms available at ICAR website.
- Upload a pool of information related to agriculture and allied sectors of the district.
- Technological modules based on the experiences of the KVK should be prepared in details and placed at the website. URL of KVK website may be linked to all possible state holders like ICAR, SAU and others.
- Latest technological updates and KVK events should be sent to farmers and other stakeholder through farmer's portal or mobile advisory service. Short notes of three minutes on successful technological intervention of farmers should be prepared and posted on KVK website.
- Development of digital content in prescribed format by KVK, having E-Connectivity, uploading e-data bank on addresses PPT, videos, Photo gallery, success stories, case stories periodically.

3.15. Office Superintendent or Accountant:

- He is responsible for maintenance of all the necessary finance, financial records of KVK and keeps the same ready for audit.
- He assists the Senior Scientist and Head in obtaining various Administrative, Financial Approvals and budgetary control on overall funds.
- He assists the Subject Matter Specialists and other technical staff in day to day routine i.e. Administrative and Financial Correspondence.
- He is responsible for any work assigned to him by the Senior Scientist and Head. The allotted work shall be completed in given time limit.
- He is in charge of all the establishment works of the organization.
- Assist the Senior Scientist and Head in administration and financial work of the KVK. Preparation of draft where necessary and issue the same after approval by the Scientists and take further action of dispatch and keep records relating to the issue of such communication.

- Follow proper filling system and keep files in an orderly manner for easy reference. Go through the receipts and separate urgent receipts from the rest, enter in the record diary, deal with urgent receipt first and put up the case to Senior Scientist and Head.
- Receive the letters, examine the issue in relation to the rules governing the subject and suggest appropriate action through notes on it.
- Maintenance of files relating to activities of the account section as per allocation order and maintaining the cashbook (revolving and main) ledger book, advance ledger, and other important document related to account section.
- Maintain the diary and dispatch register with the help of supporting staff and submission of files with comments to concern in-charge or Head.
- Monthly closing of account and prepare the monthly Quarterly and Annual Accounts of the KVK and report on time i.e. before the 10th of next month to Director ATARI, Barapani with copy to Director of Extension for information through Head of KVK.
- Any other work assigned by officer in-charge or head of KVK.

3.16. Computer Operator-cum-Junior Stenographer: The main duties and responsibilities of Computer Operator-cum- Junior Stenographer are:

1. To perform general clerical works including taking and transcribing oral dictation and providing reception services.
2. To operate a telephone switchboard or exchange; answers and directs calls in matters relating to office functioning.
3. To type and take dictation in shorthand and to transcribe it accurately.
4. To keep an accurate list of engagements, meetings.
5. To prepare computerized statistical data according to the instructions given by the Senior Scientist and Head.
6. To prepare automated cause list, inspection notes, monthly statements.
7. Collection, maintenance and computerizing all the office data.[15]

[15] *Annual Report of Krishi Vigyan Kendra*, Mamit District, 2022-23.

3.17. Driver-cum-Mechanic: The main duties and responsibilities of Computer Operator-um- Junior Stenographer are:

- He is responsible for driving and maintenance of KVK Four Wheeler Vehicles including tractors and two wheelers and maintenance of Log Books and allied records.
- He is responsible for technical inspection and maintenance of all KVK vehicles in order.
- He assists the Assistant in maintenance of Administrative and amp; Financial record in respect of vehicles.
- He is responsible for any work assigned to him by the Senior Scientist and Head. The work shall be complied in given time limit.

3.18. Supporting Staff

- He assists the Senior Scientist and Head in day to day routine office works.
- He maintains the office, Inward and Outward movement of correspondence and various office equipment, furniture neat and tidy.
- He assists the Assistant in maintenance of Store, Administrative and amp; Financial records.
- He will be responsible for Xeroxing, despatch of letters to post office, bank, ICAR and other organizations.
- His role is multi-tasking in nature.[16]

3.19. ORGANISATION OF KVK AND ITS HOST DEPARTMENT IS THAT OF THE EXISTENCE OF ADMINISTRATIVE ANOMALIES

There exist inherent Administrative anomalies in the dynamics of administration:

1. The Pay of the Senior Scientist and Heads (SS&Hs) of KVK is higher than the Supertime Grade of the Mizoram Civil Service (8900 vrs 9000 pay band 3).

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[16] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

2. The Department of agriculture, Government of Mizoram has barred the SS&H of KVKs from enjoying their due remuneration on the pretext of administrative inconvenience.[17]

Regarding the fixation of the pay of Senior Scientist and Heads, there is an apparent blatant misuse of power when we find that the Governor of Mizoram has issued an Order mandating that the SS &Hs of KVKs enjoy a grade pay of 9000 in the PB 4 way back in 2016. However, in the assent and authority of the Governor was challenged and revoked by a mere order issued by the Director of Agriculture barring the SS&H from enjoying the aforementioned pay.

Thus, there is an apparent misconduct in the administration as the order made by the host department is in direct contravention of the "due process of law", and goes against all conventions of the Mizoram Conduct of Business Act 1995.

The order of the Director of the Department can in no way, notwithstanding any clause contained in the Conduct of Business Rules supersede the Order issued invoking the name of the Governor.

However, the pay fixation of the SS & Hs was unlawfully withheld until 23rd March, 2022. Thus, in this context, one may infer that the mechanical interpretation of the ideal type of bureaucracy stipulated by Max Weber on the point of maintaining hierarchy maybe put into question.

The administrative department revoke the order of pay fixation on the ground that it may cause administrative inconvenience owing to the subordinates enjoying a higher pay than the Director. This existing phenomenon clearly violates the sociological theories of Max Weber which favours structural functionalism which was further developed by Talcott Parsons which calls for an inequality of income between the subordinates and the superiors in a work setting.[18]

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[17] Vide letter number No.J.11011/1/2019-POL/Vol-II.

[18] Interview with Senior Scientist & Head on Dt.24.03.2022, Under Secretary & Deputy Secretary from DP&AR, Government of Mizoram on Dt. 21.11.2022.

3.20. Conclusion

From this chapter, we can understand that KVK Mamit is headed by a Senior Scientist and Head assisted by a team of seven scientists from various disciplines of agriculture and works as per the thrust areas and road map of the district under its jurisdiction. The functions and role of the staff are also illustrated. It is 100% funded by Indian Council of Agricultural Research (ICAR) through the host institute i.e Agriculture Department, Government of Mizoram. There is also a mention about the existence of administrative anomaly with the host institute.

CHAPTER – IV
WORKING OF KVK FOR IMPLEMENTATION OF POLICIES, PROGRAMMES AND SCHEMES OF THE CENTRAL AND STATE GOVERNMENTS

4.1. Introduction

An attempt has been made in this Chapter to study the working of the KVK in relation to implementation and execution of important agriculture policies and schemes for the welfare of the farming community in Mamit District. The focus of this Chapter is on various on-going schemes and initiatives taken up by the Kendra that aim to increase farmers' income, financial support and improvement of their living conditions. It has also looked into convergence of KVK with all the allied functionaries in Mamit District.

4.2. Major Agricultural Schemes and Policies implemented by KVK, Mamit District

KVK, Mamit District, implements agricultural schemes and programmes of the State and the Central government. The Kendra works in consonance with the guidelines, procedures and financial provisions that are specifically laid down out under different agricultural schemes and programmes. Major Agricultural Schemes and Policies implemented by KVK, Mamit are the following:

4.2.1. Rashtriya Krishi Vikas Yojana (RKVY): RKVY is a scheme launched by the Government of India during the 11th Five Year Plan in the year 2007. The scheme aims to rejuvenate the agriculture and allied sector by means of financially incentivizing the State governments through additional central assistance. The scheme has provided flexibility to the States wherein each State prepares their own agricultural plans according to their requirements and priorities. It is a centrally sponsored scheme till the year 2014-2015. However, the funding pattern had changed in the ratio of 60:40 between the central and state governments respectively since 2015-2016. For the north eastern states the funding pattern is in the ratio of 90:10.[1]

[1] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture, p. 1-10.

After the completion of the 11th and 12th Five Year Plan, the scheme had been re-named as RKVY-RAFTAAR (Remunerative Approaches for Agriculture and Allied Sector Rejuvenation). Consequently, it was extended for another four years spanning 2017- 2021.

In the State of Mizoram, RKVY scheme has been operational since the year 2011. The State has been made eligible to avail the scheme mainly due to increase in plan expenditure of agriculture and allied sector through the flagship programme New Land Use Policy (NLUP) of the State government. The workings of KVK, Mamit under the scheme can be broadly classified into three categories –

i. **Production Growth**: Large proportion of funds under the scheme is utilized to implement various works that will contribute towards growth in production. Resources and expenditure are incurred towards training and demonstration for farmers, integrated pest management, provisions for farm mechanization by way of providing water pump-sets, power tillers and tractors.

ii. **Infrastructure and Assets**: A significant amount of funds under RKVY scheme is also used for creation of infrastructure and assets that will contribute towards development in agriculture. Under this category, the Centre implements various works such as development lands for Wet Rice Cultivation (WRC), building of drainage, renovation and improvement of existing agricultural fields.

iii. **Reclamation of infertile Soils**: Under this category, the Centre works to improve and reclaim infertile soils under cultivated lands. Works are implemented by creating provisions for irrigation channels, amendment and mixing of soils, green manuring of soils.

iv. **Training the Farmers and establishment of Farmers' Field School**: Farmers are trained to be equipped with knowledge and skills that increase their crop yields and animal productivity. To promote better use of resources in which farmers who are educated are better able to conserve water, reduce waste, and optimize the use of fertilizers and pesticides. A group of small-scale food producers are brought together by Farmer Field School (FFS), a participatory educational strategy, to address production issues through

sustainable agriculture. Concepts and techniques from agro-ecology, experiential learning, and community development are all combined in a farmer field school.[2]

Table 4.2.1: Works Implemented by Krishi Vigyan Kendra, Mamit under RKVY Scheme (2017-2021)

Sl. No.	Works	Unit (Nos. Km. Ha.)
1.	Construction of Community Water Harvesting Structure	5 Nos
2.	Construction of Individual Water Harvesting Structure	32 Nos
3.	Land Development (WC-I)	75 ha
4.	Land Development (WC-II)	84 ha
5.	Field Channel	25 km
	Cluster Demonstration on -	
6.	System of Rice Intensification (SRI)	38 ha
7.	Improved Package of Practice (IPP)	35 ha
8.	Hybrid Rice Technology	20 ha
9.	Impoved Jhum	25 ha
10.	Training of Farmers	14 Nos.

Source: Field Study

4.2.2. National Food Security Mission (NFSM): NFSM is a centrally sponsored scheme launched by the Government of India in the year 2007, during the 11th Five Year Plan (2007-2012). In light of rapid population growth in India, the scheme aims to ensure food security by increasing food grain production of rice, wheat, and pulses to 20 million tons by the end of the 11th Five Year Plan in 2012. The major objective of the scheme is to bridge the yield gap by means of propagating improved technologies and better farm management practices. Due to its success, the scheme continued in the 12th Five Year Plan (2012- 2017) by including two more components of cereals and commercial crops. The scheme has been extended to operate till the financial year of 2020-2021. The 89 scheme is availed by State

[2] *Ibid.,*

Governments on the basis of their respective State Action Plans which are prepared in consonance with the goals and objectives of the scheme. In the State of Mizoram, one major component of the scheme NFSM-Rice, has been implemented by KVK Mamit. NFSM-Pulses and NFSM-Coarse Cereals were also implemented from the year 2016. The district has witnessed significant increase in rice production with the implementation of the scheme. During 2020, a sum of 39 lakh rupees was allocated to KVK Mamit for implementation of NFSM. In the financial year of 2020-2021, NFSM-Rice, Pulses, and Coarse Cereals were implemented within the district of Mamit. The major activities of KVK under the scheme comprises of –

i. Dissemination of improved technologies among the farmers through cluster demonstration.
ii. Cropping system based trainings for the farmers are conducted with the aim of imparting knowledge on crop cultivation technology.
iii. Critical inputs are supplied to the farmers in the State. Essential inputs such as hybrid seeds, micronutrients and plant protection chemicals are distributed among the farmers. [3]

Table 4.2.2: Interventions under National Food Security Mission (NFSM-Rice) (2017-2021)

Sl. No.	Name of Circle	SRI (in hectares)	CSBD (in hectares)
1.	Lengpui	8	3
2.	Darlak	8	1
3.	Reiek	8	1
4.	Rulpuihlim	8	1
5.	Zamuang	8	3
6.	Zawlnuam	8	1
7.	Kawrtethawveng	8	1
8.	West Phaileng	8	1
	Total	64	12

Source: Field Study

[3] *Capacity Development and Targets* (2023), Krishi Vigyan Kendra, Mamit District.

4.2.3. National Mission for Sustainable Agriculture (NMSA): NMSA is a scheme developed by the Government of India. It is derived from the 'Sustainable Agriculture Mission' which is one of the eight missions outlined under 'National Action Plan on Climate Change' (NAPCC). NMSA was launched during the 12th Five Year Plan in the year 2014-2015. The scheme aims at promotion of sustainable agriculture through a series of adaptation measures focusing on ten key dimensions encompassing Indian agriculture namely; Improved crop seeds, livestock and fish cultures, Water use efficiency, Pest management, Improved farm practices, Nutrient management, Agricultural Insurance, Credit support, Markets, Access to information and Livelihood diversification. The scheme is designed to converge, consolidate, and subsume all on-going or newly proposed projects in relation to sustainable agriculture. NMSA has four major components such as Rainfed Area Development (RAD), On Farm Water Management (OFWM), Soil Health Management (SHM), and Climate Change and Sustainable Agriculture: Monitoring, Modelling and Networking (CCSAMMN).

KVK, Mamit, has taken-up activities under the scheme towards promotion of location specific integrated farming systems like horticulture, fishery, livestock, and agro-forestry. Value addition like green manuring, apiculture, application of slaked limes, distribution of pipes were also provided to the farmers under the scheme. Works in relation to sustaining soil fertility and health were implemented in different villages of the District under the component of 'Soil Health Management' and 'Soil Health Card'.[4]

[4] Citizens Charter of KVK, Mamit, Mizoram

Table 4.2.3: Works executed by KVK, Mamit under NMSA Scheme (2020-2023)

Sl. No.	Works	Unit (Nos. Km. Ha.)
1.	Horticulture infrastructure (dragon fruit, pineapple,)	132.5
2.	Improvement of fish ponds	48
3.	Piglets distributed	230
4.	Construction of Individual Water Harvesting Structure	32
5.	Construction and improvement of spatial clusters, intercropping clusters for agroforestry	80
6.	Soil sample tested	550
7.	Soil Health Card issued	550

Source: Field Study

4.2.4. Paramparagat Krishi Vikash Yojana (PKVY): PKVY is a scheme that aims to promote organic farming by adoption of organic village in different districts across the length and breadth of the country. It was introduced by the Government of India during the 12th Five Year Plan, in the year 2015. PKVY functions as one component of 'Soil Health Management' which is one major component under 'National Mission for Sustainable Agriculture'. Under PKVY scheme, organic villages were selected and adopted on a cluster basis of 50 acres and Participatory Guarantee System (PGS) of certification. The organic production of adopted villages was certified through PGS for commercial purpose. There are several villages selected and adopted as organic villages in the districts. KVK Mamit has implemented various works under the scheme such as promotion of organic fertilizers, bio control agents and eco-friendly inputs. It adopted five organic villages comprising five clusters in which there are 50 beneficiaries in each clusters. Each beneficiary possessed one acre of land which amounts to 50 acres of land per cluster. There is an enhanced production in pineapples, organic tomatoes and green peas under this scheme.[5]

[5] *kvkmamit.mizoram.gov.in*.

Table 4.2.4: Organic Villages Adopted within Mamit District under PKVY (2020-2023)

Sl. No.	Villages	No. of Beneficiaries	Size of Cluster
1.	Darlak	50	50 Acres
2.	Reiek	50	50 Acres
3.	Rulpuihlim	50	50 Acres
4.	Bungzung/Vanzau	50	50 Acres
5.	Dungtlang	50	50 Acres

Source: Field Study

4.2.5. National Mission on Agriculture Extension and Technology (NMAET): NMAET aims to consolidate, synergize and amalgamate different machineries and schemes of agriculture extension and technology. NMAET was approved and launched by the central Government of India during the 12th Five Year Plan, in the year 2014. The main objective of the scheme is to revamp and energize the extension system for effective dissemination of agricultural technology and efficient agronomic practices. There are four sub-missions under NMAET –

i. **Sub-Mission on Agricultural Extension (SMAE):** The main focus under SMAE is to create awareness among the farmers and promote the use and adoption of appropriate agriculture technology through effective and innovative methods of interaction by well trained work force.

ii. **Sub-Mission on Seed and Planting Material (SMSP):** The main focus under SMSP is to ensure the promotion and adoption of quality seeds along with appropriate planting materials. The sub-mission covers the entire process of seed chain, from nucleus seed to seed supply and so on.

iii. **Sub-Mission on Agricultural Mechanization (SMAM):** The main focus under SMAM is to ensure accessibility of small and marginal farmers to farm mechanization. It creates provisions for subsidization of farm machines, custom hiring for farmers.

iv. **Sub-Mission on Plant Protection and Plant Quarantine (SMPP):** The main focus under SMPP is to protect crops from diseases by way of promoting integrated pest management system.

KVK Mamit implements works under NMAET from the year 2018. Work components under Sub-Mission on Agricultural Extension (SMAE) were undertaken through Agriculture Technology Management Agency (ATMA) which is established in all the districts of the State. Under SMAE, the Centre implements various works such as training of farmers, exposure visit for the farmers, demonstration, farm school, mobilization of farmers as Farmer Interest Groups (FIG). Under Sub-Mission on Agricultural Mechanization (SMAM), assistance was given to farmers for procurement of agricultural machineries and equipments such as Power Tillers, Brush Cutters and Paddy Reapers.[6]

Table 4.2.5: Work Components of ATMA under SAME in Mamit District (2020-2023)

Sl. No.	Activities	Strategy
1.	Training of Farmers	Training based on different topics of Agriculture and Allied
2.	Exposure Visit	Visit to State Agriculture Universities, KVK, Departmental farms.
3.	Demonstration	Demonstration at Farmer's Field
4.	Mobilization of Farmer Groups	Farmer Interest Groups (FIGs), Food Security Groups (FSGs)
5.	Information Dissemination	Printed leaflets relating to appropriate practices in agriculture and allied sectors
6.	Farmer-Scientist Interaction	Interaction based on specific topics and schemes
7.	Farmer School	Providing technical training during all stages of cultivation to target farmers
8.	Farmer Friend	Selection of progressive farmers as Farmer's Friend to act as liaison agents between functionaries and fellow farmers

Source: Field Study

[6] *Ibid*.,

4.2.6. Pradhan Mantri Krishi Sinchayee Yojana (PMKSY): PMKSY is a comprehensive irrigation and water conservation scheme launched by the central Government of India during the 12th Five Year Plan, in the year 2015. Several on-going irrigation schemes of the government are converge and consolidated under the scheme. The main objective of the scheme is to enhance cultivable area by providing assured irrigation and promoting the adoption of effective and water saving technologies for higher productivity. KVK Mamit avail assistance from the scheme based on its own irrigation plans conceived and drawn from the district irrigation plans.

The scheme comprises four major components – Accelerated Irrigation Benefit Programme (AIBP), Har Khet Ko Pani, Per Drop-More Crop, and Watershed Development. KVK Mamit implemented work components under PMKSY from the year 2018. The Centre provides several kinds of financial assistance to farmer beneficiaries for construction and renovation of water storage tanks, provisions for connectivity of irrigation from perennial source, supply of water pipes, and provisions of water inlet and outlet. The major focus under this scheme is "Drip irrigation".[7]

Table 4.2.6: Work Components Undertaken by Krishi Vigyan Kendra, Mamit under PMKSY Scheme (2018-2022)

Sl. No.	Work Components	Achievement
1.	Land development (WRC)	25 ha.
2.	Construction of Water Tank.	30 nos.
3.	Renovation of small tank.	45 nos.
4.	Distribution of 25mm HDPE pipe	250 rolls of 10 m pipe

Source: Field Study

[7] Government of India (2013), *Benefits and Concessions Provided by Central and State Governments*, ICAR, New Delhi.

4.2.7. Mission Organic Value Chain Development for North Eastern Region (MOVCD-NER): MOVCD-NER is a scheme that aims to promote the cultivation, production and marketing of specific organic crops in the north eastern states of India. The central Government of India launched the scheme during the 12th plan period as a sub mission of the National Mission for Sustainable Agriculture (NMSA). The scheme aims to link organic crop cultivators with consumers in the market by providing end to end provisions from supply of seeds and inputs, certification of products, facilitating collection and aggregation, marketing, processing and brand building of crop commodity. It seeks to address gaps in production line of organic crops. Under the scheme, respective States of the north east implement work components through their appointed 'Lead Agency' created by State Level Executive Committee which is specifically established as per the guidelines of the scheme. Monitoring and supervision of works implemented under the scheme is undertaken by KVK Mamit. The scheme of MOVCD-NER is implemented in Mamit District by a designated lead agency called 'Mission Organic Mizoram' (MOM) in collaboration with KVK Mamit. From the year 2016, several Farmer Interest Groups (FIGs) and Farmer Producer Organization (FPO) were established under the guidance of the lead agency Mission Organic Mizoram. The State Agriculture Department also monitors and provide support in the process of work implementation under the scheme. Specific crops suitable to the local environment are selected for cultivation under each Farmer Producer Organization in different districts of the State. Marketing of farm produce are facilitated by MOM by means of tying-up with private entrepreneurs while certification of organic produce is also ensured in partnership with a French global certifying company ECOCERT.[8]

[8] *Ibid*.

Table 4.2.7: Implementation of MOVCD-NER as on September 2020 - 2023

Village	Name of Crop	Number of FPO	Number of Clusters	Number of Farmers	Area Covered (ha.)
Lengpui	Ginger & Chilli	1	2	350	48
Darlak	Ginger, Chilli & Turmeric	1	3	215	39
Rulpuihlim	Ginger & Chilli	1	2	195	31
Zamuang	Turmeric	1	2	160	25
Ailawng	Chilli	1	2	125	23
Reiek	Turmeric & Chilli	1	2	175	21
	Total	6	13	1220	187

Source: Field Study

4.2.8. National Mission on Oil Seeds and Oil Palm (NMOOP): NMOOP is a scheme launched by the central Government of India during the 12th Five Year Plan. The main objective of the scheme is to maximize production of edible oils in the country to meet increasing demands of growing population. The scheme aims to increase productivity of edible oils by maximizing the rate of yield per hectare of oilseeds, Palm was undertaken on a massive scale under the scheme. The funding pattern of the scheme for beneficiary States from the north east is in the ratio of 90:10 to be met by central government and state government respectively. The State governments avail financial assistance from the scheme based on their State Action Plans (SAP) drawn on the basis of their Annual Action Plans (AAP) which is subject to approval of the central government. Work components under the scheme were implemented mainly through the Mission Director of the scheme at the State level and Project Management Team (PMT) in the districts.

NMOOP consists of three Mini Missions (MM) namely: Mini Mission I on Oilseeds, Mini Mission II on Oil Palm, and Mini Mission III on Tree Borne Oilseeds. In the State of Mizoram, the scheme of NMOOP has been implemented by the State Agriculture Department from the year 2014 – 2015. The Directorate of Agriculture Department is the State Mission Director for NMOOP. Mini Mission I (Soyabean) and Mini Mission II (Oil Palm) are undertaken by the Directorate of Agriculture Department, while Mini Mission III on TBOs (Jatropha or Olive) is undertaken by KVK Mamit. Under the scheme of NMOOP, there are various kinds of works implemented by the department such as handing out of assistance to farmers to meet maintenance cost, planting materials, water harvesting structures. Oil palm seed gardens are established to meet farmers demand, demonstration and training for various stake holders are also organized periodically. Expansion of Oil Palm cultivable area and construction of link roads are also undertaken progressively under the scheme.[9]

Table 4.2.8 (i): Physical Achievement under NMOOP as on November, 2020 – 2023

Sl. No.	Village	Target area for 2017-2018 (ha.)	Area covered (ha.)	FFBs sold (MT)	Buying company
1	Darlak	500	90	2184.418	TATA Trust

Source: Field study

[9] Government of Mizoram (2011), *Facilities and Benefits to Farming Community*, The Synod Press, Mission Veng), Aizawl.

Table 4.2.8 (ii): Work Components Implemented under NMOOP MM-III during 2020 - 2023

Sl. No.	Component	Unit	Physical	Financial
INTEGRATED DEVELOPMENT OF NURSERIES				
A.	Land Preparation			
	Construction of Low Cost Green House @ Rs.3.253 lakhs per unit	Nos	10	Rs. 32, 53, 000
	Land Preparation	LS	LS	Rs. 39, 000
	Construction of Overhead Tanky @ Rs. 1 lakhs	Nos	6	Rs. 6, 00, 000
	Sub Total of 'A'			Rs. 38, 92, 000
INPUTS				
B.	a. Jatropha Seeds	Qtls.	16.4	Rs. 13, 120
	b. Shade Nets	Sq.m	13,200	Rs. 5, 30, 000
	c. Polythene Bags	Kg.	200	Rs. 48, 000
	Farm Yard Manure	Qtls.	100	Rs. 1, 20, 000
	Drip Irrigation System	Set	10	Rs. 5, 00, 000
	Sub Total of 'B'			Rs. 12, 11, 120
OPERATIONAL CHARGES				
C.	a. Transportational charges of Inputs			Rs. 76, 380
	b. Labour charges for filling of Polybags, clearance of land, etc.	Man day	210	Rs. 73, 500
	Sub Total of 'C'			Rs. 1, 49, 880
Grand Total				Rs. 52,53,000

Source: Field Study

4.2.9. Seed Village Programme: KVK Mamit also implements the Seed Village Programme which is a centrally sponsored scheme of the central Government of India. The programme aims to help farmers attain self-sufficiency by multiplying high yielding variety of seeds and ensuring timely availability of seeds. Several villages of the district are covered under the programme. Farmers are given practical training and demonstration for producing and storing high yielding variety seeds of

paddy, peas, agricultural and horticultural seeds. Breeder seeds were also distributed to the farmers along with financial assistance for physical preparation of land and storage bins for storing the seeds.

Table 4.2.9: Works Implemented under Seed village Programme during 2020-2023

Sl. No.	Component or Item	Amount (in lakhs)
1.	Distribution of certified seed (50% cost) of	7.449
	Paddy (Var Gomati) – 83.10 (in quintals)	
	Field Pea (VL Matar) – 50.05 (in quintals)	
2.	Farmer's training (40 groups of 50 farmers each @ Rs. 15,000 per group)	6
3.	Seed Bin – 770 nos. @ Rs. 1500 for ST farmers	11.55
	Total	**25**

Source: Field Study

The Centre has one Instructional i.e. Demonstration farm which is located at Dialdawk, 8 kilometres away from Lengpui. The nature of works executed in the agricultural farms are mainly research oriented works, field demonstration, and production of quality seeds. Quality seeds of paddy, peas, agricultural and horticultural seeds, etc. are grown and multiplied in these farms. The seeds are then distributed to the needy farmers of the district.[10]

4.2.10. Nutri Sensitive Agricultural Resources and Innovations (NARI) Programme by KVK, Mamit: Combating malnutrition and micronutrient deficiencies, nutrition-sensitive agriculture which is a food-based strategy to agricultural development emphasises dietary diversity, fortified foods and foods high in nutrients. To promote nutritional security, the ICAR has launched two special programmes for upscaling biofortified varieties of crops through Krishi Vigyan

[10] *Capacity Development and Targets* (2023), Krishi Vigyan Kendra, Mamit District.

Kendras, namely NARI and Value Addition and Technology Incubation Centres in Agriculture (VATICA).

In India, there is abundance of locally available vegetables, fruits and different types of food grains that are rich in nutrients. All these can be grown in vegetable gardens to cater to the nutritional requirements of children, adult, women and the old. The main objectives of NARI are to link agriculture to nutrients so as to encourage Nutri-sensitive agriculture and to raise awareness of women and rural youth about Nutri-sensitive agriculture and about kitchen gardening. The main activities under NARI are: conducting demonstrations and trainings on nutrient rich crops and varieties, fortification of locally available food resources, skill development through trainings and to focus and promote value addition of fruits, cereals and vegetables and Nutri-sensitive agriculture by involving schools, Integrated Child Development Centres (ICDS) Centres by promoting the concept like nutritive thali, nutrition calendar and the like.

ICAR has developed seventy-nine biofortified varieties of various crops namely rice, wheat, maize, millets, lentil, groundnut, linseed, mustard and soybean which are nutritionally rich. Besides, eight biofortified varieties of horticulture crops, cauliflower, potato, sweet potato, greater yam and pomegranate are being popularised among farmers through trainings and demonstrations involving various mass communication media.

NARI is an approach that put nutritionally rich food, dietary diversity and food fortification at the heart of overcoming malnutrition and micro nutrient deficiencies and seeks to ensure their production in adequate quantity and quality to meet the dietary requirement of population in a sustainable manner. The overall objective of NARI is to make the food system better equipped to produce good nutritional outcomes. And the idea is also includes the safe storage, processing, packaging, transportation and remunerative marketing. It also envisaged contributing towards improving health outcomes, through production of diverse, safe and nutrient-rich food and income generation that can facilitate access to health services, reducing contamination of water sources, and through the application of labour-saving technologies.

4.2.10.1. Results and Outcome of Baseline Survey

In pursuance to the intimation received from ATARI, a baseline survey was conducted at Rulpuihlim, Rengdil, Lengpui village of Mamit district on Children below 18 years of age. Based on the analysis of the data collected from the baseline survey, only 9.3% of the children are receiving adequate diet, which clearly indicated that the problem of malnutrition or under nourishment is very high among the children (age less than 18yrs.) in the selected village. Diary products and meat are rarely being consumed by majority of the villagers mainly due to their poor state of living conditions. Though, their main source of income is through farming and are also dependent on their own farm produce for household consumption, they have little or no awareness regarding the importance of balanced diet, nutritious food, and home scale crop diversification through kitchen gardening or nutritional gardening so as to ensure nutritious and balanced diet. Anganwadi Centre and schools' midday meals are the only social assistance schemes through which one can support nutritional requirements.

Unfortunately, the degree of food processing in Mamit District is quite low even if it is currently experiencing record-high food grain production. A post-harvest loss of over Rs 90,000 crore per year is estimated by NITI Aayog. Only 2% of the product gets processed despite India being the second-largest producer of fruits and vegetables in the world, behind China. The level of processing is poor (less than 10%), despite a big production base. The percentage of processed food varies between 2% and 8% for fruits and vegetables, 35% for milk, and 6% for chicken.

To focus on this aspect, ICAR has come up with VATICA. Under VATICA scheme, dissemination of post-harvest technology and skill development of farmers, farm women, rural youth and farmer organization on various post-harvest management strategies are conducted by the Centre. Advice and technical help are provided to farmers and youths interested in setting up their own enterprises related to post harvest processing.[11]

KVK Mamit District has implemented NARI project with the funding from ICAR, achievement made by the Centre is presented in the following table:

[11] Ibid.,

Table 4.2.10: Activities and Achievement made by the Centre 2020-2023

Sl. No	Activities	Achievement
1.	Conducting baseline survey	3 villages
2.	Training conducted on Nutri Sensitive Agriculture and value addition	15 nos.
3.	Demonstration of nutritional garden	9 nos.

Source: Field Study

4.2.11. Swachhta Pakhwada: In order to preserve cleanliness in tourist attractions around the nation, the Ministry of Tourism (MoT) has organised a fortnightly awareness programme named "Swachhta Pakhwada" to raise awareness of cleanliness. The goal is to strengthen the current hygiene-related initiatives being made so that mission mode pursuit results in a mind-set of zero tolerance for anything unclean. To commemorate Swachh Bharat's third anniversary, the programme has been given the name "Swachhta Pakhwada."

Swachhata Pakhwada began in April 2016 with the goal of engaging GOI Ministries and Departments in their respective areas of responsibility to bring a fortnight of intensive focus on the concerns and practises of Swachhata. The Ministries and Departments participating in Swachhata Pakhwada are regularly monitored utilising the Swachhata Samiksha online monitoring system, where action plans, photos, and videos relevant to Swachhata activities are submitted and shared. Ministries and Departments use a press conference and other communication methods to highlight their accomplishments after participating in Swachhata Pakhwada.

On 24th March, 2022, Swachhta pledge was taken by the staff of KVK Mamit, along with briefing of activities to be organized during the Pakhwada at KVK Mamit, Hand plantation of trees at Darlak was done on this day. A total of 40 persons took part in this event. During the 15-day long celebration, various activities were organized and conducted by the KVK staff with the active participation of[12]

[12] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

local farmers, youths and farm women. Pledge, cleanliness and sanitation drive, stock maintenance, awareness on importance of water harvesting and recycling of waste water for kitchen gardening and horticulture application, Swachhta and COVID-19 related awareness and safe disposal of waste, cleanliness drive and distribution of inputs, awareness on waste to wealth, composting of kitchen and home waste materials and visit to compost unit, and Kisan Diwas were held. Variety of activities such as Rallies, Distribution of Pamphlets, Wall Writings, Seminars, Lectures by Resource Persons, and other community activities were also held.

The participants also shared their experiences and gave feedback on cultivation of improved varieties of rice, maize, Vanaraja chicks, vermicompost and water harvesting units. As a part of the programme, Face mask, broom, hand sanitizer, sprayer and dustbins were also distributed.[13]

4.2.12. Knowledge Systems and Homestead Agriculture Management in Tribal Areas (KSHAMTA): The Tribal areas in India have their own distinct and a unique culture. Being geographically isolated, these areas are still devoid of the fruits of development. Agriculture is the main source of livelihood for inhabitants of this region. It thus becomes necessary that the tribal regions be developed on the basis of an integrated model involving their farm and family. The ICAR has started an initiative that involves a focused programme in 125 districts of the country where tribal population is twenty five percent or more. The programme is called the Knowledge Systems and Homestead Agriculture Management in Tribal Areas (KSHAMTA). The initiative is to grow food what one wants to eat. The basic philosophy of KSHAMTA is agricultural development of the region using the traditional knowledge of the peoples of the region. The focus of these programmes is to convene programmes on nutritionally enriching foods and to give scientific interventions on agricultural and allied sectors like livestock and fisheries. KSHAMTA also provides for the mapping of entire food system of village and suggesting what they should eat. Tribal areas are rich in medicinal and aromatic

[13] *Ibid.,*

plants which have a great economic value. The said programme should also work for the awareness, protection and conservation of such plants.

Knowledge Systems and Homestead Agriculture Management in Tribal Areas (KSHAMTA) special programme to be initiated through KVK was launched December 9 at Krishi Vigyan Kendra, Mamit.

In the technical session, Dr Rohit Shukla (Horticulture Scientist) informed the participants about concept and objectives of the programme. Further he elaborated on the Indigenous Technical Knowledge (ITK) and their scientific application for sustainable agriculture. He also deliberated a lecture on importance of nutri-cereals for health and wellbeing. Dr Mary (Soil Scientist) emphasized on importance of the use of organic inputs to enhance crop production in the district. She also informed the gathering on the New Farm Bill Act 2020. Dr. Rebecca Lalmuanpuii (Agro-Forestry) presented on integrated farming system for remunerative agricultural practices. A scientist-farmers interaction was conducted wherein the farmers shared their problems and prospects in Agriculture and Allied areas. He emphasized on 'learn and grow' and stress on the needs to utilize the technical expertise of the KVK.

Under KSHAMTA programme during the year, KVK, Mamit conducted 21 on-farm trials and 24 frontline demonstrations. Capacity development of 50 farmers, farm women and 20 extension personnel were done through training programs. Extension activities organized by the KVK Mamit benefitted 250 participants. The technological inputs like seeds (5q), planting material (21000) and livestock strains and fish finger lings (8700) were produced by the Centre. Besides, by analysing 450 samples of soil, water, plant and manure, mobile advisories were sent to 905 farmers on various aspects of agriculture.[14]

4.2.13. Role of KVKs in Jal Shakti Abhiyan of Ministry of Jal Shaki: From the year 2020- 2022, 4 melas have been organized by the Centre under Jal Shakti Abhiyan with participation of 450 farmers and school children. Number of activities

[14] *Capacity Development and Targets* (2023), Krishi Vigyan Kendra, Mamit District.

were conducted, such as discussion on water conservation and efficient water use including use of micro irrigation systems, live demonstration on drip and sprinkler irrigation systems, farmers scientist interaction, quiz competition on water management, drawing competition, film shows on importance of water conservation and micro Irrigation, demonstration on roof top rain water harvesting, sharing of farmers' experiences, method demonstration on measurement of soil moisture with electronic moisture meter, exhibition, distribution of saplings of trees, felicitation of farmers.

4.2.14. Establishment of District Agricultural Meteorological Unit (DAMU): Under a Memorandum of Understanding (MoU) with India Meteorological Department (IMD) to provide Agro-met Advisory Services in local language in the district, KVK Mamit had been assigned the task to serve the farming community in different Agro-climatic zones to reduce the risk due to climatic aberration and improve productivity, wherein District Agricultural Meteorological Unit (DAMU) was established. Under DAMU, Automatic Weather Station (AWS) was installed at KVK, Lengpui in 21st December, 2020. This Automatic Weather Station (AWS) is used for real-time information on weather at the farm level. The AWS also provides information on soil moisture and soil temperature, giving better information on the irrigation requirement. Undoubtedly, AWS is a great tool in supporting the farmers.[15]

4.2.15. ICT Initiatives

- Web Portal- Krishi Vigyan Kendra Knowledge Network Portal was launched on 8 July 2016 for regular monitoring of KVKs and to provide information and advisories to the farmers.
- mKisan Portal- This is for providing timely and need based information on weather, market, various farm operations, outbreak of pest and disease incidence and their

[15] Citizens Charter of KVK, Mamit, Mizoram

control measures, etc. to farming community. Mobile agro advisories are provided to more than 900 farmers by the Centre using mKisan portal.[16]

4.2.16. Doubling farmers' income

KVK Mamit acts as a knowledge and Resource Centre in the field of agriculture in the district to build models of technology uptake and farmers' empowerment leading to support Government of India's initiative of doubling farmers' income. The special programmes which are initiated through the KVK Scheme will help in diversifying food systems within the country. The Centre selected two adopted villages namely, Rulpuihlim and Darlak. The district unit of the Krishi Vigyan Kendra Mamit launched 'Sankalp se Sidhi' (determination to attainment) by organizing a workshop for farmers to double their income by 2022 by adopting latest technologies. The 'Sankalp se Sidhi' programme was being organised throughout the country, marking the 75th anniversary of Quit India Movement and the KVK has organised the workshop as per the direction of Indian Council of Agriculture Research (ICAR) to help farmers double their income.

The year 2021 marked the 100th year since people congregated in a church in the village of Rulpuihlim. The Govt. of Mizoram sanctioned a provision of Govt. High School and the same had been established in the year 1965. The village approach road was made with jeep-able road and later black-topped in the year 2005 which eased logistics to both: District block viz, Reiek and to Aizawl city. Since the time of their village chief, growing and cultivating various crops had been their mainstay of livelihood and some of the major crops grown were upland paddy, maize, leafy mustard, pumpkin, cowpea, tapioca, sweet potato, yam, ginger, turmeric, tree bean, climbing wattle, banana and citrus. The village has a total of 110 households with a population of 479 out of which 90 families are directly involved in Agriculture and allied activities. Total area coverage of the village is 250.03 ha with a farming area of 119.66 ha. With better roads provided, the farmers of Rulpuihlim have been supplying vegetables like pumpkin, maize, leafy vegetables and fruits to

[16] *Capacity Development and Targets* (2023), Krishi Vigyan Kendra, Mamit District.

Aizawl city. The total income of the village (2016-17) from Agriculture and allied sectors was Rs 3,107,070/- (Rupees Thirty-one lakhs seven thousand and seventy) only. After careful survey, Rulpuihlim village was selected as an adopted village under DFI programme by KVK Mamit in the year 2017.[17]

Some of the most important activities or interventions undertaken by KVK Mamit for Doubling Farmers Income (DFI) upto 2019 in Rulpuihlim village are as below: -

- Conducting OFT and FLD on nutrient management in oil palm, ginger, turmeric, protected cultivation of vegetables, IPM and INM in Mandarin orange and banana, back yard poultry farming, improve pig rearing and management.
- Diversification of crops by distributing seeds of tomato, chilli, brinjal, French bean, okra, pumpkin and maize with recommended packages of practices.
- Established two community nurseries to ensure supply of vegetable seedlings in the village.
- Popularization of backyard farming of *Vanaraja* poultry bird.
- Diagnostic visits, group discussions, need based trainings and farmer-scientist interactions were conducted.
- Establishment of seven numbers of shades net houses under the scheme "promoting usage of agro-textiles in North – East region" for round the year vegetable cultivation.
- Training on Management practices of improved breeds of Pig.
- Entrepreneurship development in the stream of pickle making, cake making and soap making for three selected women which by now depended on their income through it.
- Method demonstration on technique of soil sample collection for its analysis and issuing of 87 numbers of 'Soil Health Cards' to the farmers.

[17] Government of Mizoram (2011), *Facilities and Benefits to Farming Community*, The Synod Press, Mission Veng), Aizawl.

- Popularization of Integrated Pest Management (IPM) and Integrated Disease Management (IDM) on Khasi mandarin, banana, pumpkin, tomato, brinjal, Cole crops and distribution of plant protection chemicals.
- Popularization of Integrated Nutrient Management (INM) in vegetables.
- Processing of local vegetables and fruits to minimize post-harvest losses and value addition in different crops.
- Awareness on marketing channel of local vegetables and products for obtaining maximum profit.

Due to the above mentioned interventions, the average yield of various crops has increased to a great extent and in some cases the increase in yield was more than 39 % within 2 years of intervention. Likewise, the monthly average income of the farmers from all the sources increased to Rs. 5606.00 (2017-18) and Rs.7056.00 (2018-19) from the baseline monthly income of Rs. 4,407.00 in August, 2017.[18]

4.2.17. Soil Health Card Scheme

A Soil Health Card is used to assess the current state of soil health and, when used over time, to determine changes in soil health that are influenced by land management. A Soil Health Card provides soil health indicators as well as descriptive terms. The indicators are typically based on farmers' practical experience and understanding of local natural resources. The card provides soil health indicators that can be examined without the help of technical or laboratory equipment.

Soil Health Card (SHC) is a scheme supported by the Ministry of Agriculture and Farmers' Welfare's Department of Agriculture & Co-operation. It is being implemented by the state Departments of Agriculture as well as the state KVKs.

Farmers will benefit greatly from the Soil Health Card Scheme. India has a large number of farmer and they have no idea what crops to produce in order to maximise their yield. Basically, they don't know the quality or sort of soil they have even though they may have first-hand knowledge of which crops thrive and which fail. It is evident that they don't know what they can do to improve the soil's condition.

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[18] *Ibid.,*

Benefits of the scheme:

- The scheme monitors the soil of the farmers well and will give them a formatted report. So, they can decide well which crops they should cultivate and which ones they should skip.
- The authorities will monitor the soil on a regular basis. One in every 3 years, they will provide a report to farmers. So, farmers need not worry if the nature of the soil changes due to certain factors. Also, they will always have updated data about their soil.
- The work of the government does not stop at listing down measures required to improve the quality of the soil. In fact, they will also employ experts to help farmers in carrying out the corrective measures.
- Farmers get a proper soil health record, thanks to the Soil Health Card Scheme. Also, they can study the soil management practices. Accordingly, they can plan the future of their crops and land.
- Generally, in government schemes, the person carrying out the study for a particular farmer gets changed. But in the Soil Health Card Scheme, the government is paying attention that the same person carries out soil analysis for a farmer. This will further enhance the effectiveness of the scheme.
- The soil card provides the farmers a proper idea of which nutrients their soil is lacking. And hence, which crops they should invest in, they will also tell which fertilizers they need. So, ultimately, the crop yield will see a rise.
- The main aim behind the scheme was to find out the type of particular soil and then provide ways in which we can improve it. Even if a soil has some limitations, we can do something to get the most out of it and that is what the government is trying to do with the help of this scheme.
- The card will contain an advisory based on the soil nutrient status of a farmer’s holding. It will show recommendations on dosage of different nutrients needed. Further, it will advise the farmer on the fertilizers and their quantities he should apply, and also the soil amendments that he should undertake so as to realize optimal yields.

- One Card will provide multiple benefits. It also promotes awareness among farmers for judicious use of fertilizers leading to:
    (a) Need based use of external input.
    (b) Increased productivity.
    (c) Reduced cost of cultivation.
    (d) Sustainable soil health.[19]

4.2.17.1. Soil Health Card Portal (SHCP) for Soil Health Management:

Soil Health Card Portal is a web and smart phone-based application developed for Ministry of Agriculture & Farmers Welfare, Government of India. It facilitates generation of Soil Health Cards (SHC) in 22 different languages, 5 dialects and in local units for the benefit of farmers in uniform and standardized format across the country.

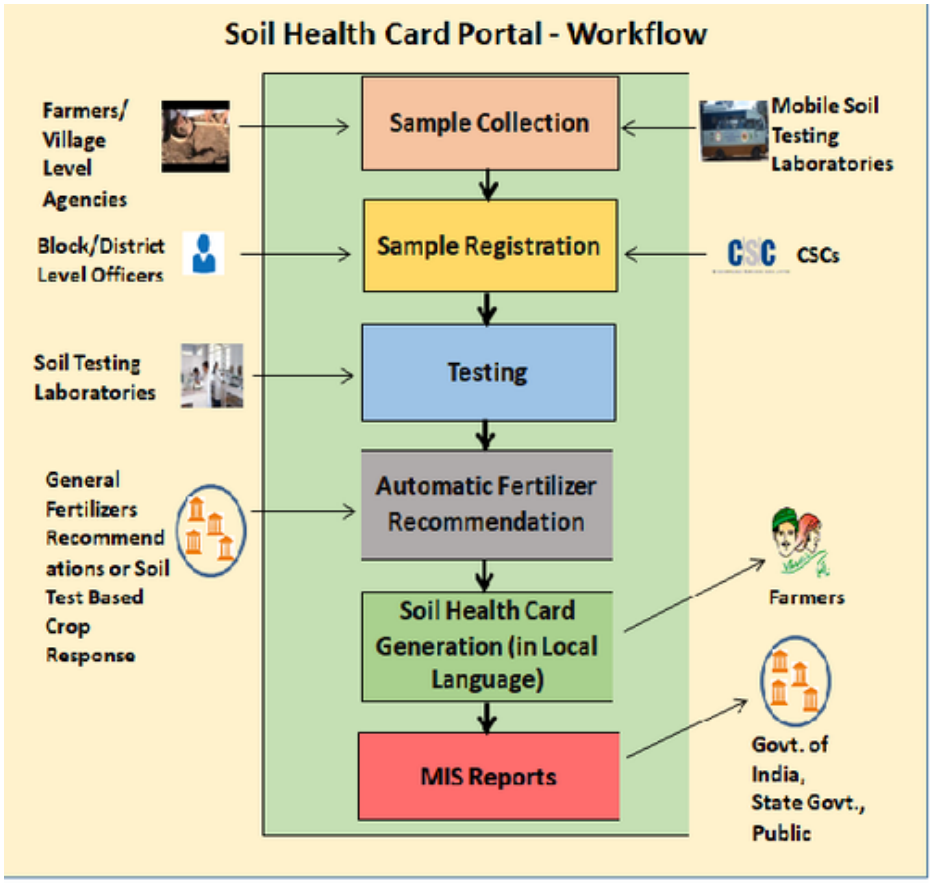
A SHCP provides the farmer with the nutrient status of his land and gives recommendations on the dosage of fertilizers, bio-fertilizers, organic fertilizers as well as soil amendments to maintain soil health in the long run.

4.2.17.2. Features of the Portal:

- Accessibility -Web and Mobile Application.
- Tracking and Notification alerts.
- Automatic calculations of recommendations.
- All type of Fertilizers.
- Multilingual.
- Dashboard and MIS reports.
- Pictorial Soil Maps.
- Links of mFMS, Land records and DM Dashboard.

[19] *Capacity Development and Targets* (2023), Krishi Vigyan Kendra, Mamit District.

Fig.4.2.17: Soil Health Card Portal



Off campus training were organized at Dapchhuah and Lengpui villages on 21st June, 2022 on the topic "Soil Health Card" to creating awareness about soil health card and need of it in agriculture among the farmers. The focus was particularly on different nutrients need of plants for its growth, importance of soil health card, how to take soil samples and where to analyse, schemes of government for soil health.

KVK, Mamit observes World Soil Day every year on 5th December and distributes Soil Health Card to the farmers of Mamit district and created awareness on soil conservation. They also emphasized soil test based on balanced use of fertilizers. The main objective is to aware farmers about the appropriate amount of fertilizers for the concerned crop depending on the quality of soil.[20]

[20] *Ibid.*,

4.2.18. Capacity Development and Advisory services

A very important role of KVK Mamit is to foster capacity development of farmers and extension personnel to update their knowledge and skills on modern agricultural technologies. Its inevitable role is to work as Knowledge and Resource Centre of agricultural technologies for supporting initiatives of public, private and voluntary sector in improving the agricultural economy of the district, and provide farm advisories using ICT (Information and communication technology) and other media means on varied subjects of interest to farmers. Trainings are being conducted for all disciplines of Agriculture Science for farmers, rural youth, extension functionaries.

The broad areas of training for farmers and rural youth are as follows:

- Imparting training for Practicing farmer and farm women with regards to organic farming, promotion of food production in waste land, efficient utilization up slope medium land by scientific cultivation of cereals, oil seeds pulses, vegetables, fruits, flowers etc, promotion and production of ducklings, goatary, poultry birds, promotion and production fresh water prawn and carp culture in small seasonal ponds.
- Training for rural youth on:
    - i) Quality seed production.
    - ii) Agro-processing for small scale entrepreneurship development.
    - iii) Production and quality management of Vermi Compost.
    - iv) Nursery management.
    - v) Poultry farming (Broiler, Kuroiler and Duck).
    - vi) Para vet nary training for Dairy management, Vet nary AID and Artificial Insemination for making of high milk production.
    - vii) Utilization of perennial water bodies through Carps and Prawn culture.
    - viii) Repair and maintenance of Diesel engine Pump set.
    - ix) Repairing of sprayers.
    - x) For Women Empowerment training on Value addition for Fruits, Vegetables and preservation. (Jam, Jelly, Pickles).
    - xi) Training on Naksha body making.
    - xii) Training on Tailoring, Embroidery, Knitting.

xiii) Training on Sal Leaf plate and Batti making.

xiv) Training for Post-harvest technology in Agro-horticultural crops.

Extension activities are being implemented in the form of Field day, Technology week, Krishi Mela, Scientists visit to farmers' field and vice versa. Besides carrying out mandatory activities, the Centre is also rendering service to farming community by supplying good quality critical inputs in terms of seeds, saplings, breeds which are being produced from the farms. It is also carrying out Soil and Water analysis in its own laboratory to test major nutrients of soil with minimum cost with an objective to rationalize fertilizer policy for farmers of different blocks. The development indicators emerged out through PRA, survey, ex-trainees' meet, exhibition diagnostic visit, appraisal reports of ICAR, workshop, seminar, SAC recommendation, local need and people' representatives recommendations are taken into account to take care of local problems and make awareness about latest technological advancement to the farmers of the districts. Accordingly the action plan is then chalked out to fulfil the mandates given by ICAR.

KVK Mamit is required to work is close collaborative mode with District Line Departments, Lead Bank (SBI, etc.), NABARD, Radio and Doordarshan to disseminate scientific activities to all corners of district. With limited manpower, it would be uphill task for KVKs to reach to the furthest corner.[21]

4.2.19. Convergence

As per mandate of ICAR, KVK is required to work in close association with all line departments of the district viz. Agriculture, Horticulture, Agricultural Technology Management Agency (ATMA), Fishery, District Rural Development Agency (DRDA), NABARD. KVK Mamit is reaching out to the farmers of Mamit district through the effective linkage with line Departments and organizations. As it is the primary institution for bridging the gap between the research stations and farmers field, a close rapport is developed with line departments such as Agriculture, Animal husbandry, Fishery, Social welfare, Village Councils, Research stations,

[21] *Annual Report of Krishi Vigyan Kendra*, Mamit District, 2022-23.

Agricultural Universities, Banks, ATMA NGOs. The nature of linkage to these organization are joint implementation of different programmes like conducting training programmes, seminars, participation in meetings and workshops, arranging awareness programmes, veterinary clinics, vaccination camps, arranging melas and exhibitions, establishment of demonstration units and model farms. The collaborative programmes have greatly helped to understand each other and execute the work united for the all-round development of the farming communities. With an idea to expand its activities for better reach, the KVK made an action plan and named it as 'People and Partnership'. This approach was launched since its inception to collaborate with various agencies to improve delivery of technical and extension services in a convergence mode.[22]

4.2.20. Conclusion

This chapter explained the various agricultural policies, programmes and schemes of the central and state governments which are implemented by KVK Mamit District for the upliftment and sustenance of farmers within the district.

[22] Government of Mizoram, *Vision 2023 Krishi Vigyan Kendras*, Research and Education, Directorate of Agriculture.

CHAPTER – V

ACHIEVEMENTS AND CHALLENGES OF KVK, MAMIT DISTRICT

5.1. Introduction

This Chapter attempts to find out the achievements of KVK Centre in promoting the welfare of farmers in Mamit District and the challenges faced in the process and the remedial measures suggested for overcoming the challenges.

5.2. Achievements of KVK, Mamit District, during 2018-2023

The achievements made by KVK, Mamit, during 2018-2023, can be studied with reference to 'Testing of Technologies' and 'Doubling of Farmers' Incomes (DFI) as follows:

5.2.1. Achievements on Testing of Technologies: As mentioned earlier, the primary objective of KVK is to conduct testing of technologies developed by various Agricultural Universities and Agricultural Research Institutes of the country. The following table shows such technologies tested during 2018-2023.

Table 5.2.1: ***Achievements on Technologies Tested Under On-Farm Trials (OFT) and Front Line Demonstrations (FLD) By KVK, Mamit District, Mizoram, 2018-2023***

Sl. No.	Technology Tested	Details of technology	Source of technology	No. of farmers benefitted
1.	Varietal evaluation of Radish	**Season:** Rabi (Nov. –Jan.) **Varieties :** Hill Queen, Arka Nishant, Pusa Himani, Japanese White Long **Seed rate** : 10 kg/ha **Sowing:** Sown on ridges to facilitate good root production. Planting distance 30cm X 10 cm **Manure and fertilizers:** Well rotten FYM or compost @ 12 t/ ha and lime @ 2 t N: P: K @ 50: 100:50 kg/ha **Irrigation:** weekly interval. **Intercultural operations :** 2 hand weeding and earhting up 20 -35 days after sowing **Harvesting :** 45-60 days after sowing **Yield :**	ICAR Research Complex for NEH Region, Mizoram Centre Kolasib Mizoram	35

<table>
<tr><td></td><td></td><td>Hill Queen: 160q/ha
Arka Nishant : 132 q/ha
Japanese White:150 q/ha
Pusa Himani : 138 q/ha
NB: Arka Nishant shows higher Orgenoleptic value</td><td></td><td></td></tr>
<tr><td>2.</td><td>Varietal evaluation of potato</td><td>Season : Rabi (Nov- March)
After harvesting of rice
Varieties
Kufri Chandramukhi
Kufri Jyoti
Kufri Giriraj
Seed rate: 30-35q. /ha
(Average tuber wt.40-45g.)
Spacing: 60cm X 20 cm
Ridge & furrow method of planting
Manure and fertilizers (apply based on soil test results) in general Well rotten FYM or compost @ 12 t/ ha, lime @ 2 t /ha. &N: P: K @ 50: 120:60 kg/ha are suggested for application.
Irrigation: one pre-sowing irrigation, then irrigate weekly interval. Stop irrigation 10 days before harvest
Intercultural operations: weeding is done 25 after days of planting, when the potato plants are 8-10 cm high, The final ear- thing up should be done when the plants are 10-15 cm high. While earthing up, the remaining dose of nitrogen (25 kg/ha) should be applied
Harvesting & Yield: Potato are harvested About 8-10 days after haulms cutting
<table>
<tr><th>Variety</th><th>Duration (Days)</th><th>Yield (q/ha)</th></tr>
<tr><td>Kufri Chandramukhi</td><td>70-80</td><td>228.40</td></tr>
<tr><td>Kufri Jyoti</td><td>110-120</td><td>195.00</td></tr>
<tr><td>Kufri Giriraj</td><td>110-120</td><td>169.20</td></tr>
</table>
</td><td>Central Potato Research Institute, Shimla, H.P.</td><td>28</td></tr>
<tr><td>3.</td><td>Use of plastic mulching in cabbage</td><td>Season: Rabi
Coloured 25 micron plastic film is laid on the well prepared bed prior to planting. The seedlings are planted at recommended spacing by making suitable hole.
Variety : Bahar
Spacing: 60 cm X 45 cm</td><td>National Committee on Plasticulture Applications in Horticulture</td><td>45</td></tr>
</table>

		Nutrient Management : Well rotten FYM or compost @ 12 t/ ha, lime @ 2 t/ha& N: P: K @ 100: 60:80 kg/ha to produce good crops. **Yield :** 36.0 t/ha **Duration :** 83 days	(NCPAH), New Delhi	
4.	Cultivation of tissue cultured strawberry cv. Sweet Charlie	**Soil** • Rich in humus, soil pH 5.0-7.5, Soil with pH value of 4.5-5.5 needs liming. • Strawberry should not be grown continuously on the same land and on the land previously devoted to potato, tomato, eggplant and pepper. **Planting** • October and November is best time of Planting .Planted in Hill row system either in single or double rows on 15-20 cm raised beds with plant to plant and row to row distance of 30x30-45 cm and 90-120 cm is kept between twin rows. **Irrigation** • Frequent light irrigation **Nutrient management** • 100:60:140kg NPK/ha in three split dose. 20:40:40 kg NPK /ha along with 20 tonnes FYM should be given as a basal dose and rest in two equal splits. **Mulching** • Mulching with paddy straw and black polythene gives good weed control, advances early cropping **Harvesting** • Fruits for local market should be picked at the pink or three-fourths coloured stage. **Packaging** • The strawberries are packed in plastic punnets and are placed in the corrugated fibre trays or ventilated cardboard boxes **Yield** 33.51q/ha **B: C ratio:** 3.45:1	Department of Biotechnology, Mizoram University, Aizawl	15
5.	Performance of passion fruit variety Yellow,	Passion fruit production (**var. yellow)** Planting in **May- June**, Bower system of training, Pruning of old twigs in Dec. –Jan.	ICAR Research Complex for NEH Region,	25

	under Mamit District Condition	Maintain one or two main stem, INM with split fertilizer application Poison bait to minimize fruit fly infestation. Mulching to conserve moisture during dry period. **Yield:** • No. of fruits/ plant(100) • Fruit weight (60g) • Fruit size(5.8X 5.3 cm) • Yield (37.50q/ha) **B:C ratio** 2.44:1	Mizoram Centre Kolasib Mizoram	
6.	Standardization of package of practices for cabbage cultivation under Mamit district Agro climatic condition.	Production technology of cabbage **Variety** : Bahar **Planting distance:** 60 x 45 cm, seedling treatment with trichoderma @20% (200g per litre) for 15 minute at time of transplanting , **Nutrient management**: FYM 20t/ha, N100kg, P60kg, K80kg/ha, **Intercultural operations** :Light hoeing, earthing up 4-5 weeks after transplanting, timely irrigation and plant protection measures **Yield** 311q/ha **B: C ratio** 3.75:1 **Duration** 85 days	ICAR Research Complex for NEH Region, Mizoram Centre Kolasib Mizoram	37
7.	Varietal evaluation of tomato Mega 1 Mega2	**Varieties:**Mega-1 & Mega-2 **Seed rate** 400g./ha **Nursery raising**: 1st fortnight of October. **Transplanting**: 1st fortnight of November **Spacing:** 60 × 75 cm. **Manure and fertilizers:** Well rotten FYM or compost @ 20 t/ ha and lime @ 2 t /ha, N: P: K @ 100: 60:80 kg/ha **Irrigation**: 7days interval. **Intercultural operations** : weeding and earthing up30 and 45 DAT (Days after transplanting) staking with bamboo **Av .Yield** Mega 1 : 310 q/ha Mega 2 : 340 q/ha B: C ratio: Mega 1 : 3.44:1 Mega 2 : 3.77:1	ICAR Research Complex for NEH Region, Umroi Road, Umiam, Meghalaya	67

<table>
<tr>
<td>8.</td>
<td>Varietal evaluation of cabbage</td>
<td>
Varieties
• Alisha
• Improved Bahar
• Manisha
• Asha
Planting distance: 60 x 45 cm, seedling treatment with trichoderma @20% (200g per litre) for 15 minute at time of transplanting ,
Nutrient management: FYM 20t/ha, N100kg, P60kg, K80kg/ha,
Intercultural operations :Light hoeing, earthing up 4-5 weeks after transplanting, timely irrigation and plant protection measures
Duration & yield :
<table>
<tr><th>Variety</th><th>Duration (Days)</th><th>Yield (q/ha)</th><th>B:C ratio</th></tr>
<tr><td>Alisha</td><td>70</td><td>371.1</td><td>2.90:1</td></tr>
<tr><td>Improved Bahar</td><td>68</td><td>376.4</td><td>2.94:1</td></tr>
<tr><td>Manisha</td><td>74</td><td>323.8</td><td>2.53:1</td></tr>
<tr><td>Asha</td><td>71</td><td>391.9</td><td>3.06:1</td></tr>
</table>
</td>
<td>* Package of practices of developed by ICAR Research Complex for NEH Region, Mizoram Centre Kolasib Mizoram were adopted
** Source of varieties Directorate of Agriculture (R&E), Mizoram</td>
<td>45</td>
</tr>
<tr>
<td>9.</td>
<td>Varietal evaluation of broccoli</td>
<td>
Varieties : Aishwarya & Kendi
Season: Rabi
Seed rate: 450 g/ ha.
Transplanting:
4-5 weeks’ old seedlings along with 4-5 leaves.
Spacing: 50 × 50 cm.
Manure and fertilizers: Well rotten FYM or compost @ 12 t/ ha and lime @ 2 t N: P: K @ 100: 60:80 kg/ha to produce good crops.
Irrigation: 7 days interval.
Weeding : 2-3 weeding followed by earthing up
Av. Yield:
• Aishwarya - 89q/ha
• Kendi -110 q/ha
Duration :
• Aishwarya - 61days
• Kendi -61 days
B: C ratio
• Aishwarya - 2.96:1
• Kendi -3.66:1
</td>
<td>ICAR Research Complex for NEH Region, Mizoram Centre Kolasib Mizoram</td>
<td>42</td>
</tr>
</table>

<table>
<tr>
<td>10.</td>
<td>Varietal evaluation of cauliflower</td>
<td>Season: Rabi
Varieties
• Ataria-153
• NP-2801
• Poornima
Seed rate: 600 g/ ha.
Transplanting: 4-5 weeks’ old seedlings along with 4-5 leaves.
Spacing: 60 × 50 cm.
Manure and fertilizers: Well rotten FYM or compost @ 12 t/ ha and lime @ 2 t N: P: K @ 100: 60:80 kg/ha to produce good crops.
Irrigation: 7-10 days interval.
Weeding : 2-3 weeding
<table>
<tr><th>Variety</th><th>Duration (Days)</th><th>Yield (q/ha)</th><th>B:C ratio</th></tr>
<tr><td>Ataria-153</td><td>68</td><td>4.1</td><td>1.25:1</td></tr>
<tr><td>NP-2801</td><td>76</td><td>113.3</td><td>1.51:1</td></tr>
<tr><td>Poornima</td><td>68</td><td>140.0</td><td>1.87:1</td></tr>
</table>
</td>
<td>Package of practices of developed by ICAR Research Complex for NEH Region, Mizoram Centre Kolasib Mizoram were adopted ** Source of varieties Directorate of Agriculture (R&E), Mizoram</td>
<td>25</td>
</tr>
<tr>
<td>11.</td>
<td>Cultivation of exotic vegetable broccoli (var. Aishwarya)</td>
<td>Season: Rabi
Seed rate: 500-750 g/ ha.
Transplanting: 4-5 weeks’ old seedlings along with 4-5 leaves.
Spacing: 50 × 50 cm.
Manure and fertilizers: Well rotten FYM or compost @ 12 t/ ha and lime @ 2 t/ha, N: P: K @ 100: 60:80 kg/ha to produce good crops.
Irrigation: 7 days interval.
Weeding : 2-3 weeding followed by earthing up</td>
<td>ICAR Research Complex for NEH Region, Mizoram Centre Kolasib Mizoram</td>
<td>27</td>
</tr>
<tr>
<td>12.</td>
<td>High density plantation of banana var. Giant Cavendish</td>
<td>High density banana plantation (Giant Cavendish)
Planting spacing 1.2 X 1.8m., treatment of planting material with Carbofuran (Furadon 3 G) @ 40 g/plant, pit size 45 X 45 X 45 cm filled with mixture of 12kg FYM and top soil. NPK was applied @ 110g, 33gm and 330 gm each plant
Yield : 49.25t/ha</td>
<td>AAU, Jorhat</td>
<td>43</td>
</tr>
<tr>
<td>13.</td>
<td>Cultivation of tomato under protected</td>
<td>Cultivation of tomato under protected condition
Variety : Arka Rakshak
Nursery raised 20-25 before planting
Raised bed Furrow method of planting</td>
<td>CIARI, Port Blair,</td>
<td>31</td>
</tr>
</table>

	condition	**Spacing:** 60 × 75 cm **Manure and fertilizers:** Well rotten FYM or compost @ 5kg/ m^2 & neem cake @ 200g / m^2, N: P: K @ 10: 6:8 g/m^2 **Irrigation**: twice in a week (3-4 day's interval). **Intercultural operations** : weeding and earthing up30 and 45 DAT (Days after transplanting)& staking with bamboo or plastic string **Av .Yield** Arka Raksshak- 62.8t/ha (6.28kg/m^2)		
14.	Cultivation birds-eye chilli using improved package of practices	Improve package of practices **Season**: Kharif **Seed rate:** 800-1000 g/ ha. **Transplanting:** 7--8 weeks' old seedlings **Spacing:** 60 ×70 cm. **Manure and fertilizers:** Well rotten FYM or compost @ 12 t/ ha and lime @ 2 t N: P: K @ 100: 60:80 kg/ha to produce good crops. **Intercultural operation:** Earthing up 30 and 45 days after planting. Weeding : 2-3 weeding **Av.yield(q/ha):** 1.24t/ha	ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib	102
15.	French bean cultivation by using improved package of practices	Season: Rabi Seed rate: 80-90 Kg/ ha. Spacing: 20 ×60 cm. Seeds treatment with Rhizobium culture @5g/kg seeds Staking for pole type varieties Irrigation: 7-10 days interval. Weeding : 2-3 weeding Av. yield:9.70t/ha	ICAR Research Complex for NEH Region, Mizoram Centre , Kolasib	55
16.	Management of weed in pineapple by plastic mulching	Black plastic, 50 micron The plastic film will be laid on the well prepared bed prior to planting. The suckers/slips should be plan ted at recommended spacing by making suitable hole. **Variety** : Kew **Spacing:** 30X 60 X 90 cm. **Nutrient Management** : A dose of N, P_2O_5 and K_2O at 12,4 and 12 g./plant/year **Yield :** 42.5 t/ha	Department of Horticulture, AAU, Jorhat,	26

17.	Improved package of Cauliflower cultivation	**Season:** Rabi **Seed rate**: 500-750 g/ ha. **Transplanting:** 4-5 weeks' old seedlings along with 4-5 leaves. **Spacing**: 50 × 50 cm. **Manure and fertilizers:** Well rotten FYM or compost @ 12 t/ ha and lime @ 2 t N: P: K @ 100: 60:80 kg/ha to produce good crops. **Irrigation:** 7days interval. **Weeding** : 2-3 weeding **Av. Yield:** 10.5t/ha	ICAR Research Complex for NEH Region, Mizoram Centre , Kolasib,	21
18.	Varietal evaluation of French bean var. Arka Anoop and Arka Komal	**Season –** *Rabi* (Nov-Feb) **Bush type French bean varieties** Arka Anoop & Arka komal **Seed rate**: 60kg/ha Inoculation of seed with *Rhizobium sp.* **Spacing:** 30 X 15cm. **Manure and fertilizers:** Well rotten FYM or compost @ 10 t/ ha and lime @ 2 t N: P: K @ 60:100:75 kg/ha **Irrigation:** 7 days interval. **Weeding :** 2-3 weeding **Av. Yield :** Arka Anoop 12.2 t/ha Arka Komal : 11.8t/ha	IIHR, Bangalore /	40
19.	Improved package of practices of Onion cultivation	**(Season:** Rabi season–October to April **Seed rate**: 7-8 kg/ha. **Nursery raising** 45-50 days before transplanting. **Preparation of main field:** broad based furrow (BBF) for planting. **Spacing:**15X10 cm **Fertilizers:**150:50:80 kg NPKS/ha Apply 50% N and 100% P, K as basal dose and remaining 50% of N to be applied in two splits at 30 & 45 days after transplanting. **Irrigation:** 7-10 days interval **Weed management:** Pre emergence application of Pendimethalin (Stomp) 3.5 l/ha combined with one hand weeding. **Harvesting:** 120-130 DAT (at 50% neck fall stage.) Av .yield : 15.85 t/ha	Directorate of Onion and Garlic Research , Pune	15
20.	Varietal evaluation of Cowpea	Comparison of cowpea varieties Arka Garima, Arka Suman & Local Season Kharif **Seed rate**: 25kg/ha.	IIHR, Bangalore	51

		Spacing: 30 X 15cm. **Manure and fertilizers:** Well rotten FYM or compost @ 10 t/ ha and lime @ 2 t/ha, N: P: K @ 60:100:75 kg/ha **Weeding** : 2-3 weeding **Av. Yield :** Arka Suman-10.7 t/ha Arka Garima- 12.2t/ha Local- 9.6t/ha		
21.	Varietal evaluation Okra	Comparison of okra varieties Arka Anmika and Kasi Unnati Season Kharif **Seed rate**: 10kg/ha. **Spacing:** 60X 45cm. **Manure and fertilizers: (**Fertilizer should be applied on base to soil test result **)** Well rotten FYM or compost @ 20 t/ ha and lime @ 2 t/ha, N: P: K @100:60:60 kg/ha **Weeding** : 2-3 weeding **Av. Yield :** Arka Anamika 9.7t/ha Kasi Unnati-9.2 t/ha	IIHR, Bangalore &	72
22.	Varietal evaluation of Pea	Whole pod edible dual purpose varieties **Arka Apoorva** and **Arka Sampurna.** Season: *Rabi* (Nov. to Feb.) **Seed rate**: 60kg/ha **Spacing:** 45 X 10cm. **Manure and fertilizers:** Well rotten FYM or compost @ 10 t/ ha and lime @ 2 t /ha, N: P: K @ 60:100:75 kg/ha **Irrigation:** 7 days interval. **Weeding** : 2-3 weeding **Av.Pod yield (t/ha) in 90 days** Arka Apoorva-7.23t/ha Arka Sampoorna- 6.97t/ha	IIHR, Bangalore	65
23.	Protected cultivation of capsicum	Protected Cultivation under poly house condition **Variety** : Arka Mohini **Nursery raised** 30-35 before planting Raised bed Furrow method of planting **Spacing:** 45× 30 cm **Mulching** with black polyethylene non-recycled mulch film of 30-100 micron thick, 1.2 m wide. **Manure and fertilizers:** (Application of manure and fertilizers base on soil test result)	IIHR, Banglore (http://www.iihr.res.in)	19

		Pruning: Retain four stems. The pruning is done after 30 days of transplanting at an interval of 8 to 10 days **Training:** The main stem of plant is tied with four plastic twine to train along and tied to GI wire grid provided on the top of the plants. This is practiced after four weeks of transplanting. **Irrigation**: Drip irrigation is given to provide 2-4 liters of water per square meter per day depending on the season **Av .Yield** Arka Mohini-18.2t/ha (1.82kg/m^2)		
24.	Varietal evaluation of tomato	Tomato varieties Arka Samrat , Arka Rakshak **Seed rate** 200g./ha **Nursery raising**: 1st fortnight of October. **Transplanting**: 1st fortnight of November **Spacing:** 60 × 75 cm. **Manure and fertilizers:** Well rotten FYM or compost @ 20 t/ ha and lime @ 2 t /ha, N: P: K @ 100: 60:80 kg/ha **Irrigation**: 7days interval. **Intercultural oprations** : weeding and earthing up30 and 45 DAT (Days after transplanting) staking with bamboo **Av .Yield** Arka Raksshak- 52t/ha Arka Samrat-46t/ha	IIHR, Benglore (http://www.iihr.res.in)	45
25.	Varietal evaluative of Onion	C**omparison of onion varieties Bhima Shubra, and Bhima Shweta** **Nursery raising** first fortnight of September **Seed rate**: 7-8 kg/ha. **Preparation of main field:** broad based furrow (BBF) for planting. **Transplanting** Last week of October to first week of November **Spacing:** 15X10 cm **Fertilizers:**150:50:80 kg NPKS/ha Apply 50% N and 100% P, K as basal dose and remaining 50% of N to be applied in two splits at 30 & 45 days after transplanting. **Irrigation:** 7-10 days interval **Weed management:** Pre emergence	Directorate of Onion and Garlic Research , Pune	14

		application of Pendimethalin (Stomp) 3.5 l/ha combined with one hand weeding. **Harvesting:** 115 DAT (at 50% neck fall stage.) **Av.Yield :** Bhima Shubra-4.40 t/ha Bhima Shweta- -3.87 t/ha		
26.	Nutrient management in Banana var. Giant Cavendish	**Nutrient management in banana** 1.Application 15kg FYM/plant before planting 2. Application of 200g nitrogen/plant in three split doses 100g. One MAP (Month after planting), 50g for MAP and remaining 50g Seven MAP. 3.100g phosphorus/ plant, Single dose at planting 4. 300g. Potash /plant in two split dose. At planting and eight MAP *i.e.* at shooting **Av. Yield:** 28.18 t/ha	ICAR Research Complex for NEH Region, Mizoram Centre , Kolasib	21
27.	Protected cultivation of cucumber	Cultivation of cucumber under protected condition **Variety** : Japanese long green Raised bed Furrow method of planting **Spacing:** 1.2m X 45 cm **Manure and fertilizers:** Well rotten FYM or compost @ 5kg/ m^2 & neem cake @ 200g /m^2, N: P: K @ 10: 6:8 g/m^2 **Irrigation**: twice in a week (3-4 day's interval). **Training & pruning** :the main stem trained on overhead wire along a polythene twine or on the trellis of bamboo transplanting **Av .Yield :** 11.84 t/ha	CIARI, Port Blair,	7
28.	High density planting of papaya	High density planting of papaya Var. Pusa Nanha **Panting Spacing**: 1.25m X 1.25 m. **Female : male plant ratio** 10:1 Square System of planting **Pit size** 60 X 60X 60 cm **Nutrient application** FYM 10 kg & N:P:K 250g /pit Av. Yield:44.80 t/ha	Technologica l options for Enhanced productivity and profit" IARI, New Delhi,	13
29.	Round the year	• Net house & low cost poly house • Using of transparent and 200 µpolythene	1.Centre for Protected	8

	vegetable cultivation under protected condition	sheet and local available materials • Raised bed cultivation • Mulching with black polyethylene non-recycled mulch film of 100 micron thick, 1.2 m wide. • Crops Tomato, French bean & cucumber in sequences • Cultivars: Tomato: Arka Rakshak, French bean: Arka Anoop, Cucumber: Japanese long green • Yield : Tomato : 34.2t/ha French bean: 12.4 t/ha Cucumber : 1186 t/ha	Cultivation Technology (CPCT), IARI, New Delhi 2. Division of Horticulture, ICAR Research Complex for NEH Region, Umroi Road, Umiam-793103, Meghalaya	
30.	Varietal evaluation of Gladiolus	Varietal evaluation of Gladiolus 1. Bangalore 2. Melody (OPA) 3. Pusa Gungan 4. Melody (OPA)pink 5. Pusa Mayur 6. Pusa Urvashi 7. Pusa Suryakiran 8. Dhanvantri 9. Pusa Shabnam **Season**: Rabi (Nov. to Feb.) **Propagation** through corms. **Spacing :** 45 X 15 cm **Manure and fertilizers:** Well rotten FYM or compost @ 20 t/ ha and lime @ 2 t /ha 120 kg N, 150 kg P_2O_5 and 150 kg K_2O per ha. is recommended, of which 60 kg N and entire dose of P2O5 and K2O is applied as basal dose. The remaining N is given in two split doses, 30 and 60 days after planting. **Irrigation:** 7 days interval. **Intercultural operations:** Earthing up and 2-3 weeding and 20-30 days interval. Staking is done if required **Harvesting:** Harvested when the first 5-6 flower buds show the colour and the first flower bud is ready to open the next day **No. of Spike yield/ ha** Bangalore : 31111 Melody(OPA) : 32000	IARI, New Delhi	3

		Pusa Gungan : 42000 Melody(OPA) pink : 33333 Pusa Mayur : 40000 Pusa Urvashi : 31111 Pusa Suryakiran : 32222 Dhanvantri : 29556 Pusa Shabnam : 38889		
31.	Comparison of different substrates for preparing Vermi-compost	Identification of suitable biomass for composting among • Wild banana pseudostem, • Water hyacinth and • Weed biomass **Earthworm specie** : *Eisenia fetida* **Cow dang** collected locally • Organic waste that is decomposable was subjected to certain preliminary treatment. This is to enhance vermicompostability and its efficiency. • All the waste materials such as banana psudostem, water hyacianth and weeds cut into pieces for enhancing decomposition vermi composting process. • The wastes were subsequently spread in a layer and exposed to sun for two days and then transferred to shade. • Cow dung slurry was prepared and was sprinkled on the wastes. The wastes were allowed for 10 days for pre digestion **Days to composting :** 1.Banana pseudostem (68 days) 2.Water hyacinth (63 days) 3. Weed biomass (72 days) **Yield:** 1.Banana pseudostem (5.2qt/bin of 6 cu.m) 2.Water hyacinth (4.8qt/bin of 6cu.m) 3. Weed biomass (4.9 qt/bin of 6 cu.m) *Farmers are ready to take up wild banana pseudostem although it takes longer duration than water hyacinth as it is more abundant	ICAR Research Complex for NEH Region, umroi Road, Umiam, Meghalaya	3
32.	Effect of different levels of nitrogen applications on yield of	Application of recommended dose of P_2O_5, K_2O and FYM and Different dose of Nitrogen N_0- 0kg/ha (local check / control) N_1- 40kg/ha N_2- 60kg/ha N_3- 80kg/ha	ICAR Research Complex for NEH Region, Mizoram Centre ,	12

	cabbage Var. Bahar	N_4- 120kg/ha N_5- 140kg/ha It was observed that the gradually increasing trend of nitrogen effectively increases the yield of cabbage. Maximum yield (316q/ha) was obtained with application of N_2 @ 120kg/ha after that yield was goes down.	Kolasib	
33.	Integrated nutrient management on cabbage	• **Variety :** Bahar • Judicious use of manures and fertilizers (NPK- 100:60:80, FYM-20t/ha, neem cake -2t/ha, vermicompost – 5 t/ha) with recommended package of practices • **Crop duration** : 87 days • **Av. Head weight :** 1.3 kg • **Yield :**338 qt/ha	ICAR Research Complex for NEH Region, Mizoram Centre , Kolasib	9
34.	Integrated nutrient management on Broccoli	• **Variety** : Aishwarya • Judicious use of manures and fertilizers (NPK- 100:60:80, FYM-20t/ha, neem cake -2t/ha, vermicompost – 5 t/ha) with recommended package of practices • **Crop duration :** 65days • **Av. Head weight :** 328 gm • **Yield :** 73q/ha	ICAR Research Complex for NEH Region, Mizoram Centre , Kolasib	14
35.	Leaf litter amendment in rice fields of *jhum* based cropping system	Collection of leaf litter biomass from adjacent forest floor and incorporation in *jhum* crops especially rice in the form of mulch @3 kg/ sq m. **Yield:**-12.4 q/ha **Duration:** 4 months	CPGS, CAU, Umiam	21
36.	PSB application for augmentation of available phosphorus in WRC	Root dip treatment of paddy seedlings with PSB one night prior to transplanting @ 4kg MC/sq m **Yield:-** 44q ha^{-1}	CPGS, CAU, Umiam	6
37.	Half-moon terracing in oil palm for nutrient and moisture retention	Construction of half-moon terrace (2 m dia) at the rhizhopheric area of Oil Palm and application of recommended NPK doses (350-100-300-75 g of N-P_2O_5-K_20-$MgSO_4$ / palm / year) based on soil test results **Yield:-** 9 t FFB/ha/yr	NRC-OP, Pedavegi	67

38.	Site specific nutrient management in rice using Leaf Colour Chart (LCC)	1. Growing of rice as per traditional practice 2. Matching leaf colour with LCC at critical growth stages 3. Application of fertilizers as and when required **Yield:-** 43.2q ha^{-1}	Punjab Agricultural University	14
39.	Integrated nutrient management in banana	1. Half-moon terracing of planting area 2. Hedgerow plantation across the slope for nutrient retention (T. candida) 3. Mulching with azolla and unwanted pseudostem 4. Application of recommended dose of fertilizer (10 kg FYM, 100gm N; 40gm P;90gm K/plant)	ICAR, NEH, Barapani	21
40.	Use of microbial consortia in rice fields of *jhum* based cropping system	1. Inoculation of microbes with seeds before sowing (200g/ kg seeds) 2. Timely spraying of liquid MC formulation (1000ppm) **Yield:-** 12.2q ha^{-1}	CPGS, CAU, Umiam	63
41.	Use of Azolla for nitrogen supplement in WRC	1. Introduction of Azolla in paddy cultivated plots 2. Thinning of excess azolla **Yield:-** 37.2q ha^{-1}	IARI, Delhi	17
42.	Multipurpose tree based agroforestry system	Cultivation of Pineapple with *Parkia roxburgii* Cultivation of Pineapple with planting density 32625 plant/ha of with *Parkia roxburgii* Yield of Pineapple (1^{st} year)= 120 qtl/ha (2^{nd}year)=125qtl/ha (3^{rd}year)=120qtl/ha Farmers practice- (1^{st} year)= 120 qtl/ha (2^{nd}year)=120qtl/ha (3^{rd}year)=120qtl/ha *3.Parkia roxburgii* plant height was measured and the mean height was: 1^{st} year(June)=1.5 feet 1^{st} year (Feb) =3feet 2^{nd} year (June)=5feet 2^{nd} year (Feb) =6.5 feet	ICAR for NEH region, Barapani	3

		3rd year (June)=8feet 3rd year (Feb) =9.8 feet		
43.	Introduction of Fodder Oat(JHO-822)	Season: *Rabi* Season(Nov –March) a) 100 kg seed should be sown per hectare by seed drill or in lines. The spacing between rows to row should be 20-25 cm. the seed should be treated with Mancozeb 75% WP @ 2.5 g/kg of seed to ensure freedom from smut. b) 50 kg of Urea and 188 kg of SSP per hectare should be applied uniformly and incorporated thoroughly in the soil as basal dose. 40 kg of Urea should be applied at 30 days after sowing .The feed value of fodder at pre-flowering and flowering is high. The crop should be harvested at 50% flowering or bloom stage and 40 kg should be applied at 60 days after sowing. c) The feed value of fodder at pre-flowering and flowering is high. The crop should be harvested at 50 % flowering/bloom stage **Yield :** 280q/ha	All India Co-ordinated Research Projects on Forage crops (AICRP-FC), CAU, Imphal.	4
44.	Intercropping of oil palm with maize. Maize will be grown in the inter-space of oil palm trees	1. Farmers practice-Cultivation of oil palm. 2. Cultivation of oil palm with Maize Existing oil palm cultivation is selected and in between oil palm trees Maize(local variety)is sown Yields of Maize = 16qt/ha	NRC Oil Palm, Pedagiri	6
45.	Introduction of Napier hybrid(CO-3)	a) Ridges are made across the slope at a spacing of 60 cm with a height of about 25 cm. b) Root slips or stem-cuttings are planted at a distance of 50 x 50 cm c) Application of Nitrogen @ 30 kg/acre after every harvest d) The first cut is taken from 60 to 75 days after planting. Subsequent cuts are taken after 30-45 days or when the plants attain a height of 1.5m. Annually at least 6 to 8 cuts are possible **Yield:** 180t/ha	All India Co-ordinated Research Projects on Forage crops (AICRP-FC), CAU, Imphal.	2
46.	Cultivation of Fodder Rice bean(Bidhan	a) 60 kg seed should be sown per hectare by seed drill or in lines. The spacing between rows to row should be 30 cm. The seed should be treated with Mancozeb 75% WP @ 2.5 g/kg	All India Co-ordinated Research Projects on	7

	-1) during Kharif	of seed to ensure freedom from any seed borne diseases. b) 20 kg of Urea and 188 kg of SSP per hectare should be applied uniformly and incorporated thoroughly in the soil as basal dose. 10 kg of Urea should be applied at 30 days after sowing and the remaining 10 kg should be applied at 60 days after sowing. c) The feed value of fodder at pre-flowering and flowering is high. The crop should be harvested at 50 % flowering or bloom stage. **Yield :**200q/ha **Duration :**120 days	Forage Crops (AICRP-FC), CAU, Imphal.	
47.	IPM of Stem borer & Leaf Folder in Rice	1) Seedling root dip treatment in Chlorpyriphos 20 EC @ 10ml/10 litre water for overnight. 2) 6-8 releases of *Trichogrammajaponicum* @ 50,000/ha/week 30DAT 3) Spraying of Monocrotophos 36 EC @ 2ml/litre water at 45 DAT **Yield and Pest incidence** **IPM** Crop yield = 48.85 q/ha Pest incidence= 10% **Farmers practice**: yield 30 qtl/ha pest incidence – 25%	Deptt. of Entomology, ICAR, Barapani,	24
48.	Weed Management in WRC	Pre-emergence application (3-5 DAT) of Butachlor 1 kg/ha followed by weeding at 40 DAT **Yield** **Improved practices** **Yield** = 48.89 qtl./ha **Dry wt. of weed** : 30 DAT= .64g/sq.m 60 DAT= 5.0g/sq.m Harvest= 5.0g/sq.m **Farmers practice**: **Yield** 30 qtl/ha **Dry wt. of weed** : 30 DAT= 25g/sq.m 60 DAT= 30g/sq.m Harvest= 35g/sq.m	AAU, Jorhat	4
49.	Integrated Disease	1. Treating the nursery bed with *Trichodermaviride @ 2 %*	ICAR Research	10

	Management in Tomato	2. Soil drenching with Ridomil MZ 2g/l @ 8-10 days interval till seeds are ready for transplanting. 3. Removal and burning of affected leaves and fruits. 4. Application of Metalaxyl & Mancozeb @ 2g/l alternatively at the time of disease appearance. **Yield & Disease incidence** **Improved practices** **Crop yield** = 240 qtl /ha **Disease incidence** : 5 % **Farmers practice –** **Crop yield**= 145 qtl/ha **Disease incidence** = 20 %	Complex for NEH Region, Mizoram Centre, Kolasib.	
50..	Disease Management of Blast of Rice	1. Spraying of Hexaconazole (Contaf 2ml/litre water) 2. Removing and destroying weed hosts on the field bunds and channels. 3. Treating the seeds with Captan or Carbendazim at 2 g/Kg seed or Spraying the nursery with Carbendazim 50 WP 2.5 g/litre water. 4. Spraying the main field with Carbendazim 250g/ha 5. Using Dhaincha or Sunhemp as green manure and judicious use of Urea (N). **Yield & Disease incidence** **Crop yield** = 28 qtl/ha **Disease incidence**= 10% **Farmers practice**: **Crop yield** 19.5 qtl/ha **Disease incidence** – 25%	IARI	19
51.	IPM on Stem and Fruit Borer of Brinjal	1. Clip and destroy borer damaged shoot 2. Release of *Trichogramma brasiliensis* @ 150000/ha or use of lucilure sex pheromone @ 100 traps/ha at 20-25 DAT and replacing lure at monthly interval till harvest. 3. Spraying 2-3 times Cypermethrin @ 4ml/10 lit water at 10-15 days interval **Crop yield** = 224 qtl/ha **No. of infested plant** at 10 days interval (11 plants) **Farmers practice :** **Crop yield** = 117 qtl/ha	IARI	6

		No. of infested plant at 10 days interval (38 plants)		
52.	Rhizome rot management in Ginger using Biofor-Pf2	a. Seed Treatment with Biofor-Pf-2 @ 10kg/kg seeds b. Soil treatment @ 1 kg Biofor-Pf2 /10kg cow dung c. Seed + soil treatment **Yield & Disease incidence** **Crop yield** = 125 qtl/ha **No. of infected plant** at 10 days interval (25 plants) **Farmers practice:** **Crop yield**= 82.5 qtl/ha **No. of infected plant** at 10 days interval (55 plants)	Department of Plant Pathology, AAU, Jorhat.	21
53.	Bacterial wilt management in Tomato using Biofor-Pf2	Seed Treatment with Biofor-Pf-2 @ 1gm/kg seeds, root treatment @1kg/2litre water/1000 seedlings, Soil treatment @ 1 kg Biofor-Pf2 /10gm mixed with 100gm cow dung/ plant, Seed + soil treatment **Yield & Disease incidence** **Crop yield** = 210 qtl/ha **No. of infected plant** at 10 days interval (15 plants) **Farmers practice:** **Crop yield**= 160 qtl/ha **No. of infected plant** at 10 days interval (40 plants)	Department of Plant Pathology, AAU, Jorhat.	31
54..	IPM in Brinjal	1) Removal of infested plants. 2) Use of lucilure sex pheromone traps @100 traps/ha. at 30 DAT 3) Release of *Trichogramma chilonis* @ 50000/release at weekly interval for 4-5 times. 4) Spraying 5% neem seed kernel extract to kill early stage larvae. 5) Spraying of Endosulphan@ 2ml/litre water. **Yield and Pest incidence** **Improved practice:** **Crop yield** = 230 qtl/ha **No. of infested plant** at 10 days interval (8 plants) **Farmers practice :** **Crop yield** = 130 qtl/ha **No. of infested plant** at 10 days interval (28	ICAR Mizoram Centre, Kolasib.	18

		plants)		
55.	IDM in Brinjal *Refined	1)Seed Treatment with Biofor-Pf-2 @ 1gm/kg seeds, 2)Root drip treatment @1kg Biofor Pf2/2litre water/1000 seedlings, 3)Soil treatment @ 1 kg Biofor-Pf2 /10gm mixed with 100gm cow dung/ plant, Seed + soil treatment 4) Soil drenching with Metalaxyl and Bordeaux mixture 1%. **Yield & Disease incidence** **Improved practice:** **Crop yield** = 220 qtl/ha **No. of infected plant** at 10 days interval (5 plants) **Farmers practice(Control) Crop yield** = 115 qtl/ha **No. of infected plant** at 10 days interval (34 plants)	Department of Plant Pathology, AAU, Jorhat.	7
56.	IDM in Tomato	1) Treating nursery bed with *Trichoderma* culture @ 2%. 2) Removal of infected plants. 3) For leaf curl, spraying of Malathion/ Dimethoate 1ml/litre water 3 weeks after transplanting and at 15 days interval. 4) For late blight, spraying of Metalaxyl and Mancozeb @ 2gm/litre water alternatively at the time of disease appearance. 5) For bacterial wilt, soil drenching with Bordeaux mixture 1%. **Yield & Disease incidence** **Improved practice:** **Crop yield** = 250qtl/ha **No. of infected plant** at 10 days interval (15 plants) **Farmers practice(Control) Crop yield** = 125 qtl/ha **No. of infected plant** at 10 days interval (40 plants)	ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib. 2009	8
57.	Disease Management in Ginger	1).Soil drenching with Mancozeb @ 0.3% 2).Seed/rhizome treatment with Carbendazim (0.3%) for soft rot 3). Combine treatment with Ridomil MZ (0.1%) + Carbendazim (0.1%) + Chlorpyriphos (0.05 %), by dipping the seed rhizomes for 30	ICAR (RC) for NEH Region	16

		minutes **Yield & Disease incidence** **Improved practices:** No. of infected plant at 10 days interval (125 plants/ha,) Yield record =97.48qtl/ha **Farmers' Practices :** No. of infected plant at 10 days interval (314 plants/ha,), 2.Yield record =67.4qtl/ha		
58.	IPM in Tomato	1).Seed treatment with Imidacloprid @ 5gm/kg seed 2). Sowing of trap crop, ie., Marigold as border crop. 3). Spraying of Imidacloprid @ 1 ml/3-4 litres water. **Yield and Pest incidence** **Improved practices:** No. of infected plant at 10 days interval (125 plants/ha,) Yield record (97.484qtl./ha), **Farmers' Practices :** **No. of infected plant** at 10 days interval (314 plants/ha), **Yield** record (67.4qtl/ha)	ICRISAT	19
59.	IPM in Chilli	1).Seed treatment with Imidacloprid @ 5gm/kg seed 2). Sowing of trap crop, ie., Marigold as border crop. 3). Spraying of Imidacloprid @ 1 ml/3-4 litres water. **Yield and Pest incidence** **Improved practices:** **No. of infected plant** at 10 days interval (311 plants/ha. for 5 times) **Yield** record (101.364 q./ha), **Farmers' Practices :** **No. of infected plant** at 10 days interval (935 plants/ ha, for 5 times), **Yield** record (54.58 q/ha)	ICRISAT	17
60.	Integrated Pest Management in Rice	1. Use of disease and insect free pure seeds. 2. Clipping of tip of seedlings at the time of transplanting. 3.Release of *Trichogramma japonicum* & *T. chilonis* 4. Spraying of **Cartap Hydrochloride** 50% SP@ 1000gm/ha for stem borer & leaf folder.	NCIPM	25

<table>
<tr><td></td><td></td><td>5. Spraying of Imidacloprid 17.8% SL @1.5ml/litre of water for plant hopper.
Yield and Pest incidence
Improved practices:
No. of infested plant at 10 days interval (15 plants/ha,)
Yield record (29.2qtl./ha),
Farmers' Practices : No. of infected plant at 10 days interval (35 plants/ha,),
Yield record (19.4qtl/ha)</td><td></td><td></td></tr>
<tr><td>61.</td><td>Integrated Disease Management in Okra</td><td>Use of resistant variety, viz Arka Anamika
Spraying of Imidacloprid @1.5 ml/litre water
Yield & Disease incidence
Improved practices:
No. of infected plant at 10 days interval (10 plants/ha)
Yield record (80qtl./ha),
Farmers' Practices :
No. of infected plant at 10 days interval (30 plants/ha),
Yield record (58qtl/ha)</td><td>TNAU, Coimbatore, Tamil nadu</td><td>34</td></tr>
<tr><td>62.</td><td>Evaluation of breed of milch cows</td><td>Technology Assessed:
Up gradation of local milch cows with Holstein Friesian, Jersey, sahiwal or either of their combination
Breed
HF cross breed milch cows
Data on parameter
<table>
<tr><th rowspan="2">Breed</th><th colspan="4">Parameter</th></tr>
<tr><th>Milk Yield (l. /day)</th><th>at %</th><th>NF%</th><th>B:C ratio</th></tr>
<tr><td>F cross breed milch cows</td><td>6.03</td><td>97</td><td>83</td><td>79:1</td></tr>
<tr><td>Local cows</td><td>3.40</td><td>2</td><td>1</td><td>39:1</td></tr>
</table></td><td>ICAR Research Complex for NEH Region, Umiam, Meghalaya,</td><td>4</td></tr>
</table>

63.	Varietal Evaluation of different fodder crops	**Crops:** Lucerne, Cow Pea, Berseem Adopted recommended package of practices of cultivation **Seed rate** : 20-25 kg /ha **Lucerne:** 1. Crop duration: 150 days as annual crop* **2.** Harvesting The first cutting 55–65 DAS The subsequent cuts; 30–35 days interval. No of cuts: 4–5 cuts Yield: 330 q/ha **B:**C ratio: 3.18:1 **Cow pea** **1. Crop duration:** 50-60 days **Harvesting:** 50-60 DAS at 50% flowering stage Summer crop 70-75 DAS **Yield :** 210q/ha **B:**C ratio: 2.65:1 **Berseem** 1. Crop duration: 120-125 days **2.** Harvesting The first cutting 55DAS The subsequent cuts; 25–30 days interval. No of cuts: 3-4 cuts Yield: 240 q/ha **B:**C ratio: 3.09:1	ICAR Research Complex for NEH Region, Umiam, Meghalaya	3
64.	Varietal Evaluation of piglet housing pen in reducing early piglet mortality	Backyard pig farmers rearing sows for piglet were provided piglet pen/rails and compared on piglet mortality and diseases due to overcrowding etc to those who did not provide such facility. Besides mortality due to scours or piglet anaemia mortality of piglets with provision of railings : 20.8% **Farmers' practice: *Mortality without railings: 32.8%*** **B:C ratio** Improved practice - 3.57:1 Farmer practice -2.7:1	ICAR Research Complex for NEH Region, Umiam, Meghalaya	5

65.	Green fodder cultivation a.Maize (African tall) b. Alfalfa (Hybrid Texas/Dallas -137)	Maize Dry Matter percentage: 13 Crude Protein percentage: 10.86 Crude fiber percentage: 25 Change in Milk yield: Fat%: 3.97 SNF%: 8.94 Alfalfa DM%: 9.66 CP%: 19.7 CF%: 10.53 Change in Milk Yield: Fat%: 3.2 SNF%: 7.2 *control: Fat%: 3.2 SNF%: 7.1 Maize (African tall) Average yield: 4.8 t/ha Duration: 95 days Alfalfa (Hybrid Texas/Dallas-137) Average yield: 235 t/ha Duration: one year	ICAR Research Complex for NEH Region, Umiam, Meghalaya,	2
66.	Breed evaluation Improved Pig Rearing: Hampshire	Body Weight gain: 1.56 kg edible kitchen waste was fed with an approximate 1 kg of locally available greens and an approximate 100 gms concentrate on a daily basis. The average monthly weight gain upto 10 months of age approximated 5.600 Kg	ICAR Research Complex for NEH Region, Umiam, Meghalaya,	3
67.	Improved dual purpose birds (BV-380)	The age at sexual maturity: 182 days ± 2 days The egg production: 13.8 eggs per month per hen for a period of 8 months Average egg weight: 56 gm	ICAR Research Complex for NEH Region, Umiam, Meghalaya,	7

68.	Fodder Quality a) Maize MYGROW-1303 RES (Dual purpose) b) Subabul K 8/B-42	a. Crop variety: Maize MYGROW-1303 and Subabul K 8/B-42 b. Sowing time: Late March to mid-April c. Land preparation: Land prepared thoroughly d. Fertilization: 33.6 kg N, 11 Kg P and 3.6 Kg K in the form of Urea, SSP and MOP e. Pest and Disease: As per package of practices when necessary **MYGROW – 1303** Average yield: 4.8 t/ha Duration: 95 days **Subabul K8/B-42** Average yield: 36 t/ha Duration: 2 years	ICAR Research Complex for NEH Region, Umiam, Meghalaya	2
69.	Breed Introduction Gramapriya	The age at sexual maturity: 159 days ± 3 days The egg production: 15.2 eggs per bird during 8 months of laying The average egg weight: 57.3 gm	ICAR Research Complex for NEH Region, Umiam, Meghalaya	3
70.	Fodder production and quality enhancement	a. Crop variety: Yellow Maize (African tall) b. Sowing time: Late March to mid-April c. Land preparation: Land prepared thoroughly d. Fertilization: 33.6 kg N, 11 Kg P and 3.6 Kg K in the form of Urea, SSP and MOP e. Pest and Disease: As per package of practices when necessary Average yield: 3.3 t/ha (green fodder) Duration: 95-102 days	ICAR Research Complex for NEH Region, Umiam, Meghalaya	3
71.	Fodder production Green Fodder Cultivation Using: a.Maize RCM 75	a. Crop variety: Maize RCM 75 b. Sowing time: Late March to mid-April c. Land preparation: Land prepared thoroughly d. Fertilization: 33.6 kg N, 11 Kg P and 3.6 Kg K in the form of Urea, SSP and MOP e. Pest and Disease: As per package of practices when necessary Average yield: 5.5 t/ha Duration: 80 days	ICAR Research Complex for NEH Region, Umiam, Meghalaya	3
72.	Improved dual purpose bird: Vanaraja	The age at sexual maturity: 151 ±2 days The egg production: 15.6 eggs per hen during a period of 8 months The average egg weight: 58 gm	ICAR Research Complex for NEH Region, Umiam, Meghalaya	14

73.	Fodder production Green Fodder Cultivation Using: a.Maize QPM-1	a. Crop variety: QPM-1 b. Sowing time: Late March to mid-April c. Land preparation: Land prepared thoroughly d. Fertilization: 33.6 kg N, 11 Kg P and 3.6 Kg K in the form of Urea, SSP and MOP e. Pest and Disease: As per package of practices when necessary Average yield: 5.9 t/ha Duration: 90-95 days	ICAR Research Complex for NEH Region, Umiam, Meghalaya	4
74.	Breed introduction: Dual purpose Kamrupa	The age at sexual maturity: 118 ±2 days The egg production: 14.8 eggs per hen during a period of 8 months The average egg weight: 52 gm	ICAR Research Complex for NEH Region, Umiam, Meghalaya	3
75.	Breed introduction Improved meat purpose bird: Krishibro	The weight within 60 days: 1625 gm The Dressing percentage: 68%	ICAR Research Complex for NEH Imphal	12
76.	Paddy cum fish culture	Species: *Cyprinuscarpio* 2. Stocking density 5000nos./ha 3. Liming 500 kg/ha/year 4. Cow dung 20 tons/ha/year 5. Feeding 2 % of fish body weight 6.Productivity Fish: 440 kg/ha/5 months Rice: 29.62 q/ha Disease: No 7. Survivability of fish:82%	College of Fisheries, AAU, Assam	3
77.	Paddy cum fish culture * Refined (Stocking density increased 5000 nos. to 10000 nos. per ha**)**	1.Construction of strong dyke with provision of weirs and screens at the sluice gate 2. Construction of lateral trenches (20% of the total area) 3. Lime : 500kg/ha 4. Manure: 30 ton/ha 5. Fish species: *Cyprinus carpio* 6.Stocking density: 10,000nos./ha 7. Feeding: rice bran and oil cake(7:3) 2% of body weight 8.Paddy variety: local 9.Productivity Fish: 594 kg/ha/5 months Rice: 28.35 q/ha	College of Fisheries, AAU, Assam	3

		Disease: Nil 10. Survivability of fish: 63%		
78.	Carp seed rearing at backyard pond	1. Species: Spawn of catla, rohu and mrigal 2. Pond size: 200m^2 Depth: 1m 3. Lime : 1.75 kg/.02ha 4. Application of MOC (5kg) 5 days before stocking 5. Application of soap oil emulsion 6. Feeding with rice bran and oil cake (1:1), 1-5 days 4 times of the initial body weight, 6-12 days 8 times of the initial body weight 7. Survivability 55 % 8. Average size of the harvest Length (mm) Weight (mg) Catla 21 93 Rohu 20.1 90 Mrigal 19.2 66 9. Numbers recovered 55000 nos.	AAU, Jorhat	7
79.	Common carp seed rearing at backyard pond	1. Species: Spawn of Common carp (*Cyprinus carpio*) 2. Pond size: 200m^2 Depth: 1m 3. Lime : 1.75 kg/.02ha 4. Application of MOC (5kg) 5 days before stocking 5. Application of soap oil emulsion 6. Feeding with rice bran and oil cake (1:1), 1-5days 4 times of the initial body weight, 6-12 days 8 times of the initial body weight 7. Survivability 54 % 8. Average size of the harvest Length-19.5mm, Weight – 18.7mg 9. Numbers recovered 54000 nos.	AAU, Jorhat	6
80.	Feeding carps with balanced diet	Fish stocking density @ 10,000 kg/ha b. Stocking ratio: Catla -20%, Silver carp-20%, Rohu-20%, Mrigal- 15%, Grass carp- 10% and Common carp-15%. c. Lime is applied @500 kg/ha/yr d. Feed ingredients: rice bran and mustard oil cake-1:1,mixed with mineral mixture @1% on daily basis e. Followed by application of Raw cow dung,	AAU	3

		Urea and SSP @ 20,000/ha, 240 kg/ha and 300 kg/ha respectively. f. Feeding rate: 3 % of the total biomass per day **g**. **Growth rate & Productivity** **balance diet**: Growth rate- 315 g/fish/yr Productivity- 2520 kg/ha Mortality- 2% Disease- No **Control:** Growth rate- 61.22 g/fish/yr Productivity- 620 kg/ha Mortality- 5% Disease- No		
81.	Cattle fish integration	1. Fish Species: catla, rohu, mrigal, grass carp, silver carp and common carp 2. Stocking density: Fish-10,000 nos./ha , Cattle- 5nos./ha 3. Liming 500 kg/ha/year 4. Daily manual application of cow dung 5. **Growth rate & Productivity** **Fish** Growth rate- 300 g/fish/yr Productivity- 2940 kg/ha Mortality- 2% Disease- No **Cattle:** cross breed *Holstein Friesian* Milk : 2840 lt/cow/year Calf: 5 nos. Disease- No	ICAR, Barapani	3
82.	Integrated duck fish farming	Integrated duck fish farming 1. Liming: 500kg/ha 2.Stocking density of fish : 8000fingerlings/h & duck: 500 nos. /ha 3. Fish Species *Catla catla* - 20%, *Labeo rohita*-10%, *Cirrhinus mrigala*-20%, *Hypophthalmichthys molitrix*-20%, *Ctenopharyngodon idella*-20% and *Cyprinus carpio*10%. 4.Duck species- Indian Runner and Khaki Campbell 5. 3-4 weeks old ducklets are kept 6. Feed composition: Paddy-70%, Rice polish-28%, Salt-0.5% and mineral mixture-1.5%.	ICAR, Barapani,	3

		7. **Growth rate & Productivity Fish**: Growth rate- 244 g/fish/yr Productivity- 2420 kg/ha Mortality- 2% Disease- No **Duck:** Growth rate-0.00397kg/day Productivity- 716.3 kg/ha Duck egg- 20608 nos. Mortality- 1.2% Disease- No **Control:** Growth rate- 61.22 g/fish/yr Productivity- 620 kg/ha Mortality- 5% Disease- No		
83.	Fish pickle preparation	1. Mix the fish thoroughly with 3% of its weight of salt and keep for two hours. Light salted and partially dried fish also may be used. 2. Fry the fish in minimum quantity of oil. Set apart the fried fish. 3. Fry the ingredients (mustard, green chillies, garlic, ginger) in the remaining quantity of oil and then add chilli powder, piper powder and turmeric powder and mix well over low flame for a few minutes. Remove from fire, add fried fish and mix well. 4. When cooled, add vinegar, powdered cardamom, clove, cinnamon, sugar and remaining salt and mix thoroughly. 5. Sufficient quantity of boiled and cooled water may be added to cover the ingredients well. Transfer to clean, sterile g1ass bottles and seal with acid proof caps. Take care to see that there is a layer of oil over the contents in the bottle. 6. Flexible pouches made of 12 micron polyester laminated with l 18micron LD-HD co-extruded film can also be use for packing the pickle. 13.Profit- Rs. 115/kg 14. B:C ratio: 1.54	College of Fisheries, AAU, Assam	25

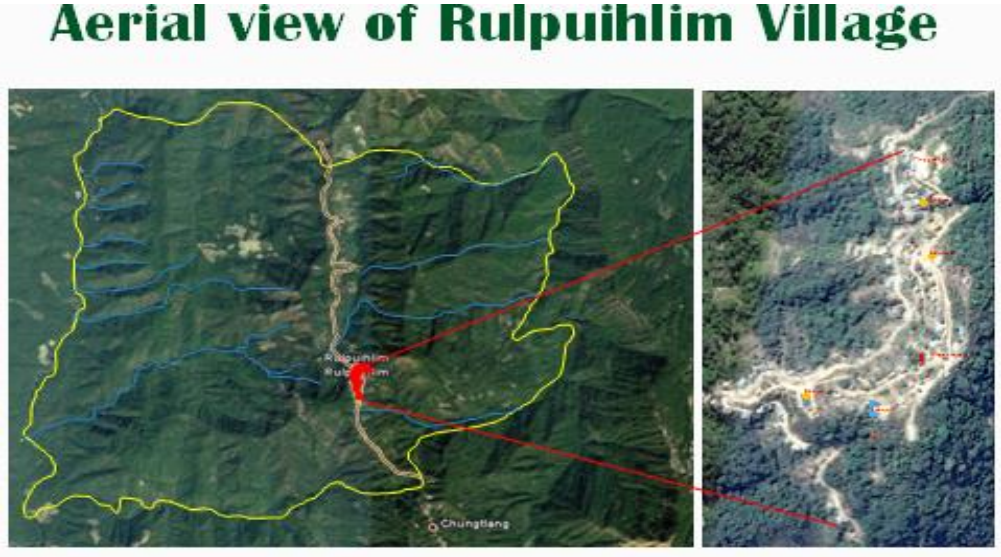
5.3. Achievements of KVK Mamit Centre in 'Doubling Farmers Income (DFI)

KVK, Mamit, has made laudable achievements for 'Doubling Famers' Income (DFI)' by adopting different strategies. KVK Mamit had selected Rulpuihlim village as a pilot project for "Doubling Farmers Income." By way of proving this claim, the researcher has made a case study of Rulpuihlim village where this Pilot Project has been implemented. The Profile of Rulpuihlim is as follows:

Village Profile:

Name of the village	**Rulpuihlim**
Block	Reiek RD Block, Mamit District
Location	Latitude: 23°42.578′N, Longitude : 92°33.616′E
Number of Household	110
Number of families involved in agriculture and allied activities	90
Total Population	479 (M -239, F -240)
Topography	Undulating hilly terrain
Agro climatic zone	Subtropical hill zone
Agro-ecosystem	Jhuming, horticulture, backyard livestock rearing
Soil type	Laterite, Clay and Sandy loam

Fig.5.3: Aerial View of Rulpuihlim Village



Some of the most important strategies adopted by KVK Mamit for making achievements in 'Doubling Farmers Income (DFI)' in Rulpuihlim village upto 2022 are:

1) Conducting OFT & FLD on nutrient management in oil palm, ginger, turmeric, protected cultivation of vegetables, IPM & INM in Mandarin orange and banana, back yard poultry farming, improve pig rearing and management.

2) Diversification of crops by distributing seeds of tomato, chilli, brinjal, French bean, okra, pumpkin and maize with recommended packages of practices.

3) Established two community nursery to ensure supply of vegetable seedlings in the village.

4) Popularization of backyard farming of *Vanaraja* poultry bird.

5) Diagnostic visits, group discussions, need based trainings and farmer-scientist interactions were conducted.

6) Establishment of seven numbers of shade net houses under the scheme "promoting usage of agro-textiles in North – East region" for round the year vegetable cultivation.

7) Training on Management practices of improved breeds of Pig.

8) Entrepreneurship development in the stream of pickle making, cake making and soap making for three selected women which by now depended on their income through it.

9) Method demonstration on technique of soil sample collection for its analysis and issuing of 87 numbers of soil health card to the farmers.

10) Popularization of Integrated Pest Management (IPM) and Integrated Disease Management (IDM) on Khasi mandarin, banana, pumpkin, tomato, brinjal, Cole crops and distribution of plant protection chemicals.

11) Popularization of Integrated Nutrient Management (INM) in vegetables.

12) Processing of local vegetables and fruits to minimize post-harvest losses and value addition in different crops.

13) Awareness on marketing channel of local vegetables and products for obtaining maximum profit.

As a consequence of the above mentioned interventions, the average yield of various crops has increased to a great extent and in some cases the increase in yield was more than 39 % within 2 years of intervention. Likewise, the monthly average income of the farmers from all sources has increased to Rs. 5606.00 (2017-18) and Rs.7056.00 (2018-19) from the baseline monthly income of Rs. 4,407.00 in August, 2017.

5.3.1. Impact of KVK's Interventions in Rulpuihlim Village of Mamit District

The Intervention made by KVK Mamit along with the efforts rendered by other sister departments has transformed the village into one of the forefronts of organic farming in the district. The constructions of 7 (seven) shade nets houses under the scheme called "Promotion of usages of Agro textile in North Eastern region," the village had become a model for greenhouse farming. The establishment of community nursery had helped the village to produce their own seedlings which were not practised before.

Practice of Pickle making, Hair Vitamins, Cake Making and Soap making have put the village on the face of the map of Mizoram, with their products found in every mini-mart in Aizawl. Specifically, C. Rinsangpuii of "3 kids Pickle" had participated in an entrepreneurship competition where she was placed in the top 20 successful participants of the state.

Distribution of seedlings such as tomatoes, brinjals, cabbages, chillies and fruits such as mangoes and papaya had made it into their primary export and their main source of income. Distribution of poultry birds such as *Vanaraja* & Rhode Island Red had also played an important role in their self-sufficiency.

As anticipated by the Govt. of India, selected village under DFI for the district of Mamit (an aspirational district) showed improvement from its early stage alone. The farmers of Rulpuihlim had a hunger to increase their productivity but were somehow in the dark until KVK introduced the various technologies. Though diversification of crops and expansion in cultivation area can result to an increase in production. It was the eager and willing woman as well as the youth of the village that actually made the difference. Repeated reminding by the Scientists of the KVK through trainings, personal phone calls, social media *etc*.enforced the

working homemakers to increase their knowledge on value addition, layer poultry and piggery farming. With the advent of shade net house under Scheme Promotion of agro textile in North East India which totalled 7 beneficiaries, round the year vegetable production was carried out by the concerned KVK as OFT and later as FLD. Having highlighted the increase in production by this village it may be prudent to state that another 1-2 years would be required to reach the ultimate goal of Doubling Farmers Income. The following photographs show some of the interventions in the adopted village**:**

Fig. 1 & 2: Dignostic visits

Fig. 3- 10: Products of Entreprenuer from adopted village

Fig.3 Turmeric & Soap

Fig.4 Pickles

Fig. 5 Soap Making from palm oil **Fig. 6 Soap Making from palm oil**

Fig. 7-8 Cosmetics produced by Entrepreneur of DFI Village

Fig.7 Face Pack **Fig. 8 Hair Vitamin**

Fig. 9-10 Different Value Added Products

Fig. 11-14: Cultivation & popularization of Tomato at Rulpuihlim village

Fig. 11

Fig. 12

Fig.13

Fig.14

Fig. 15 & 16 : Distribution of Seedlings

Fig.15

Fig.16

Fig. 17 Awareness campaign on soil health

Fig. 18 & 19: Cultivation of Banana & Tree bean

In addition to Testing of Technologies and Doubling of Farmers' Income, KVK, Mamit, has made other remarkable **achievements**, some of them are:

1) **Weather Advisory to farmers with the help of AWS (Automatic Weather Station**): Proper farming decisions are the primary benefits of anticipating the weather state of a location at a given moment. Prior weather knowledge allows farmers to make decisions that reduce expenses while increasing agricultural outputs and revenues. As a result, farmers can limit their sensitivity to excessive environmental effect. Automatic Weather Station (AWS) was installed at KVK, Lengpui in 21st December, 2020. This Automatic Weather Station (AWS) is used for real-time information on weather at the farm level. The AWS also provides information on soil moisture and soil temperature, giving better information on the irrigation requirement. Undoubtedly, AWS is a great tool in supporting the farmers.

KVK, Mamit conducts training and supportive extension programmes to increase climate awareness among the farming community and to disseminate climate resilient technologies to increase farming resiliency to weather anomalies and hill agriculture profitability. Notable here is that KVK, Mamit is the only centre amongst all the other KVKs in Mizoram to have an Agro-Met scientist and is the only centre to establish an Automatic Weather Station (AWS). This can indeed be regarded as "a state of the art" for the whole district of Mamit and Mizoram as well.

2) **Seed replacement**: Seed replacement of local variety of turmeric with high curcumin content variety, i.e. lakadong variety. Turmeric (*Curcuma longa*) has long been used in traditional Indian medicine. KVK Mamit replaced the local variety of turmeric with lakadong variety and started this pilot project at Reiek RD Block with the fund received from NABARD in collaboration with Reitlang Organic Producer Company Limited (ROPCO). The current area under Lakadong is around 50 ha with a total production of 255 tons (2021-2022) and a productivity of 5 tons per hectare is enough to feed the demand for seed multiplication. To address this issue and meet future demands the project aims to increase the productivity to 7 tons per hectare.

3) **Combating Fall Army Worm**: In the year 2019, there was a serious outbreak of Fall Army Worm in Mizoram. Mamit district was also severely affected in which maize crops from 29 villages of the district were heavily infested by the insect pest. KVK Mamit had intervened successfully in controlling the pest by scientific management, namely Integrated Pest Management (IPM). IPM is an integrated strategy of pest control which aims at prevention of pests and its damage through a combination of techniques such as chemical, biological, new cropping system, modification of cultural practices, use of resistant varieties and through mechanical methods.

IPM emphasizes the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms. The following are the methods and strategies taken up by KVK Mamit to tackle this issue:

i) **Seed treatment and use of resistant varieties:** Treating the seeds with recommended pesticides especially biopesticides will help in reducing the early

damage of the seedlings and laying of egg masses. Cultivation of resistant varieties is also an effective management technique.

ii) **Crop management:** One of the best methods with zero input cost is through the crop management practices. Going for early planting and avoiding late planting and staggered planting will reduce pest incidence. Good soil health and adequate moisture help to raise a healthy crop which can withstand infestation. Unbalanced fertilizer application especially high nitrogen application will increase the oviposition of the insect. Keeping the field clean and managing the crop residue will improve the crop.

iii) **Cropping system:** It is observed that the infestation is more in monocropping of maize. Growing inter crops like legumes will reduce infestation. Certain flowering plants like Coriander, Marigold, Fennel, etc. attract beneficial insects which are natural enemies. Trees also play a major role as they harbour birds which are natural enemies. The "PUSH-PULL" strategy is a habitat management in which a repellent crop or attractive trap crop is grown to repel pests and attract natural enemies.

iv) **Mechanical control:** It is very important and generally followed in small holdings. Collection and destruction of egg masses and young larvae can be taken up. Application of sawdust or sand into the whorls leads to the aberration and desiccation of the young larvae. Use of traps, bird perches can also be taken up.

v) **Biological control:** Naturally existing enemies act as bio control agents. Parasitoids come under this category. These Parasitoids lay eggs on egg masses, larvae or adult of FAW which destroys the host by growing on them. KVK Mamit had saved 550 farmers so far.

4) **Soil Health Card**: Giving farmers' accurate utilization of fertilizers with the help of Soil Health Card Scheme. A Soil Health Card is used to assess the current state of soil health and, when used over time, to determine changes in soil health that are influenced by land management. A Soil Health Card provides soil health indicators as well as descriptive terms. The indicators are typically based on farmers' practical experience and understanding of local natural resources. KVK Mamit is equipped with soil testing laboratory since its inception. The centre had so

far tested 3600 soil samples collected from the district. Based on these soil test results, 3000 soil health cards were issued to the farmers.

5) **Skill Training for Rural youth (STRY**): The government's flagship program is called Skill Development for Rural Youth. In line with the National Policy on Skill Development & Entrepreneurship 2015, the Ministry of Agriculture & Farmers Welfare, Government of India, has taken the lead in implementing the Sub-Mission on Agricultural Extension (SAME) of the National Mission on Agricultural Extension & Technology (NMAET)'s Skill Development Component, which includes Skill Training of Rural Youth (STRY) and Farmers Capacity Assessment & Certification (FCAC).KVK Mamit had taken up of extensive scientific training programmes to the rural youth of the district to acquire permanent income generation. Eg- pickle making, mushroom cultivation, vermicompost, bee keeping, ornamental fish rearing, poultry, piggery and composite fish culture. So far the centre had successfully trained 350 rural youths under STRY.

6) **Breeding of fish:** KVK Mamit is equipped with fish hatchery (Chinese hatchery) for breeding and multiplication of fingerlings of different species of fish. The hatchery is having production capacity of 2.5 million fingerlings in one breeding season. Every year, the centre produced fingerlings of different species such as common carp, grass carp, silver carp and Indian major carps. The uniqueness of this centre is that it is the only centre in Mizoram to have successfully bred silver barb (*Puntius gonionotus*) species in Mizoram. The silver barb is one of the five most important aqua-cultured freshwater species. It is a short-cycle species which can be reared with low technology and relatively less effort than other species.

7) **Introduction of new varieties of tomato:** KVK Mamit had successfully introduced high yielding and multiple disease resistant varieties of tomatoes i.e. Arka Abhed and Arka Samrat variety way back in 2021. The seeds were procured from Indian Institute of Horticultural Research (IIHR), Bangaluru. A total of 150 farmers had benefitted in the district. The success story of this crop has been popularized in other districts of the state of Mizoram and now had become the most popular variety of the state.

5.5. Major Problems and Challenges

Following are some of the major problems and challenges faced by KVK, Mamit:

1. Lack of proper coordination and cooperation from other allied functionaries: Although KVK is to work hand in hand with other sister departments, many a times, the allied functionaries do not co-operate with the centre.

2. The one major challenge which is continuously faced in agricultural research by KVK is the realization that not all technologies developed are equally applicable to every agro-climatic zone.

3. Allied functionaries, host institutes and even the ICAR institutes do not consider the technology assessments of the KVKs as research and do not involve the KVKs in their research deliberations at all.

4. Understaffed: Staff like MTS (Multi-tasking staff) who can operate tractors, power Tillers, etc. which will definitely ease the work load are still not approved by the ICAR.

5. The district development departments, the allied functionaries and even the host department are always eager to achieve the targets of their technical programmes largely by using the KVK scientists, thus compromising on the KVK mandates.

6. Limited fund from ICAR- Only 18 lakh rupees is granted annually by the ICAR for the management of all the activities.

7. Lacking of advanced infrastructural facilities: The centre is lacking various infrastructural facilities such as animal clinic, hi-tech nursery for raising horticultural crops, demonstration unit for poultry, piggery, dairy are also not satisfactory.

8. Permanent labour problems: There is no provision for recruitment of permanent labour post for the execution of the day to day field works.

9. Insufficient provision for mobility: The centre is provided with only one office vehicle which hampers the smooth functioning of the seven scientists and other technical staff.

10. Lack of promotion channel for the staff of KVK: The staff recruited in KVK do not have any scope for promotional avenues. However, Career

Advancement Scheme is being provided by the host institute, i.e. Agriculture Department, Government of Mizoram.

11. No provision for building maintenance: There is no budgetary provision for the maintenance of the existing buildings of the centre. It lies at the mercy of the host institute, i.e. Agriculture Department, Government of Mizoram.

12. Insufficient revolving fund: The centre received one time grant of only one lakh rupees as revolving fund from ICAR which is inadequate to generate income for maintenance of the farm activities. The centre had so far generated only seven lakh rupees.

13. Inadequate funds and lack of travelling allowances: There is a provision of only 2.5 lakhs under travelling expenses which is not sufficient to meet the expenditure incurred in connection with the travelling expenses of scientists and other staff.

14. All the staff are facing problems such as lack of provident funds, lack of retirement benefits and worried about job security. Senior Scientist and Head also reported that Subject Matter Specialists and Programme Assistants try to join some other institutes due to the fact that there is a feeling that their job is not permanent and at the same time there is so much financial constraints that KVK staff do not get salary for 2-3 months which indirectly hampers the performance of the centre.

15. Post of an employee shown in KVK but placed at some other place: Recently, Subject Matter Specialist (Fishery) was transferred to KVK, Kolasib. This hinders the on-going activities under Fishery discipline as the substitute is not posted.

5.6. Remedial Measures

The following are some of the remedial measures suggested by the researcher for overcoming the aforesaid challenges**.**

1. Since KVK is the centre that works strenuously for the upliftment of the farming community, it is the responsibility of the allied functionaries to cooperate with it for achieving optimum result.

2. KVK should conduct more multi locational testing of different technologies so that the technologies will be equally applicable to every agro-climatic zone.

3. While conducting assessment of technology, KVK scientists should confine themselves in following proper research methodology so that their findings will be valued by the host institute as well as ICAR.

4. Recruitment of multi-tasking staff such as tractor operators, power tiller operators, etc. which will certainly improve the field work capacity of the centre.

5. The host department and other line departments should refrain themselves from engaging KVK scientists for their technical programmes so that KVK can successfully achieve their mandated activities.

6. As the contingency fund received is only 18 lakh rupees, it is desirable that if the ICAR could increase the fund as per the demands of the centre, it would prove to result in better functioning and management of the various mandatory activities.

7. ICAR and the state government should provide more fund so that requirement of infrastructural facilities will be enhanced.

8. Creation of Group D permanent post for the fulfilment of the smooth execution of the mandated activities.

9. As mentioned earlier, the centre is provided with only one vehicle, if ICAR can increase the allotment of office vehicles, it will definitely increase the working capacity of the field staff.

10. The staff of KVK, both clerical and technical, do not have any promotional avenue during their entire career. Therefore, it is the need of the hour for the ICAR to make new provisions for promotion in order to boost their morale.

11. The administrative buildings, farmer hostels and staff quarters are constructed 15 years ago and they have started deteriorating. Renovation of these buildings is urgently required.

12. An additional amount of at least rupees 10 lakhs maybe provided by ICAR as an incentive so as to generate more income from the existing revolving fund.

13. Provision of at least 9 lakh rupees as travelling allowances will enable the staff of KVK to perform their out-station duties satisfactorily.

14. Securities such as Provident fund and Pension Benefits should also be facilitated to the staff of KVK as truly deserved by them, so that they will have a sense of belongingness to KVK and will not aspire to join other institutes.

15. In future, the host institute should not transfer the technical staff while he is engaging with important on-going research works.

5.7. Conclusion

In this chapter, it is leaned that KVK Mamit District had so far successfully tested and demonstrated 83 technologies developed by various agricultural universities and institutes through On Farm testing and front line demonstration, which had eventually helped the farmers of Mamit district to a great extent. We can also understand the different achievements made by KVK Mamit District. The challenges faced by it are also discussed and finally, the remedial measures were also highlighted.

CHAPTER -VI

RESULTS AND DISCUSSIONS

6.1. Introduction

Krishi Vigyan Kendra (KVK), Mamit District, has been considered as playing a vital role for the upliftment and welfare of the farmers through implementation of various agricultural projects and schemes within the district. By way of collecting empirical data with regard tothe effectiveness or otherwise of the organisation towards achieving their goals and also the hurdles which stand on the way to implementation of agricultural projects and schemes by KVK, Mamit District, two sets of Questionnaires- structured and unstructured - were framed. One set of Questionnaires wasadministered to the officials of KVK and its allied functionaries, such as ATMA, DAO and DHO who are being posted within Mamit district. Similarly, another set of structured and unstructured Questionnaires wasframed and administered to the beneficiaries of the projects and schemes implemented by KVK, Mamit District, with the aim of finding out the contributions of KVK, Mamit Centre, for the upliftment and welfare of farmers.

The study of implementation of agricultural projects and schemes by KVK, Mamit, is an attempt to find out whether the working of KVK, Mamit, is benefitting the farmers to improve their livelihood or not. Thefollowing data collected from the respondentswith the help of closed ended and open-ended questionnaires have been analysed and interpreted formaking the reliable findings as follows:

6.2. Analysis of Responses to the Questionnaires by the KVK Officials

As stated above, Questionnaires were framed and administered to KVK officials with a hope of collecting information concerning the management, the policy, man-power and the funding pattern of the organisation. So, officials who are concerned with such matters have been selected by the researcher. The total number of respondents selected by the researcher is 50, out of which 100 % of the targeted officials had given their responses.

(a) Question relating to Fund received from ICAR

With a view to understanding the perception of the officials of KVK, Mamit District, regarding the adequacy or otherwise of fund received from ICAR, the respondents were asked to state whether KVK has received adequate fund from ICAR for the management of mandated activities or not. The data in the following table represents the results of their responses.

Table 6.1: Adequacy or otherwise of the Fund received by KVK from ICAR

Yes	%	No	%	No Idea	%
8	16	38	76	4	8

The data in the above table reveals that only 16% of the officials of KVK, Mamit District, are of the opinion that the fund they have received from ICAR is adequatefor implementation of the projects and schemes whereas 76% of the respondents representing the officials disclose that the fund received from ICAR is insufficient to meet the demands of KVK for implementation of the projects and schemes. In the meantime, 8% of the respondents have no idea.

The major findingthrough the analysis of data in the above table is that, since KVK is fully funded by ICAR having Agriculture Department of Mizoram as its host institute, the insufficient fund may be supplemented by the State Government through allocation of substantial amount of fund for the smooth and efficient functioning of the Centre to serve the interest of farming community within the district.

(b) Questions relating to sufficiency or otherwise of Manpower in the Organisation of KVK, Mamit District.

For understanding manpower position in KVK under study, Questionnaire was framed and administered to the KVK officials for eliciting their opinion about the staff strength in their Kendra. Accordingly, the respondents were asked to state whether manpowercurrently engaged with the fund provided to them by ICAR was/is sufficient to cater the overall welfare of farmers within the jurisdiction of Mamit District, their responses to the Questionnaire are the following:

Table 6.2: ***Man-power position of KVK, Mamit District***

Yes	**%**	**No**	**%**	**No Idea**	**%**
20	40	30	60	0	0

The data in the above table reveal that 60 % of the respondents concluded that the existing staff strength is not adequate to handle and cater the overall management of the Centre while 40%, of 50 respondents from KVK, Mamit District, feel that the present staff strength is adequate.Even though the size of the organisation is not big as compared to other allied departments, there is still a need to increase the staff strength for better functioning of the Centre.

Since the total sanctioned post of KVK is limited by ICAR to 16 in number, there is a need for increasing the staff strength especially of Subject Matter Specialists (SMS) of some disciplines. Presently, the Centre is having 7 Subject Matter Specialists. It is felt necessary to increase thenumber of posts for Subject Matter Specialistsby at least 3 more numbers. Therefore, the posts for SMS (Agronomy), SMS (Extension) and SMS (Agriculture Engineer) may be created to cater the needs of the farming community in the district. In addition, it is felt necessary to recruit more Multi-Tasking Staff who can operate both Tractors and Laboratory Equipments.

c) Impact of implementation of various Schemes by KVK for the welfare and benefit of farmers

In order to make impact assessment of various projects and various welfare schemes implemented by KVK, Mamit District, the respondents from the officials were asked to state whether various schemes implemented by them have an impact on the wellbeing of the farmers.

Table 6.3: Impact of implementation of Projects and Schemes by KVK, Mamit District

Yes	%	**No**	%	**No Idea**	%
50	100	0	0	0	0

The above table shows that 100% of the official respondents accept that various projects and welfare schemes implemented under KVK, Mamit District, have an impact on the wellbeing of the farmers by cater to their needs. It can, therefore, be construed that the projects and schemes, such as Doubling Farmers' Income, RKVY, NFSM, PKVY, Seed Village Programme, NARI , KSHAMTA, DAMU, implemented by KVK have a great positive impact for the benefits of farmers in the district.

d) Impact of trainings for generation of sustainable economic development.

With a hope to collect a reliable data on whether the various trainings conducted by the organisation have generated sustainable economic development, the following question was generated.

Do you think that various training programmes conducted by KVK have generated enough sustainable economic stability so far?

Table 6.4: Impact of various trainings conducted by KVK, Mamit

Yes	%	**No**	%	**No Idea**	%
46	92	1	2	3	6

The above table revealed that 46 respondents out of 50 agreed the fact that various trainings conducted by KVK had generated economic stability to the farmers especially the rural youth who had gained practical knowledge through skilled trainings imparted from time to time.

e) Convergence

With the intention to gather information about the convergence of KVK with other allied functionaries, the following questions were enquired from the same 50 officials.

(i) Is the convergence of KVK with other allied district offices like ATMA, DAO etc. good enough for the progress of agriculture as well as the upliftment of farmers of the district?

Table 6.5.e.i: Convergence of KVK with other allied district offices

Yes	%	**No**	%	**No Idea**	%	**to some extent**	%
18	36	22	44	4	8	6	12

Table 6.5.e.i had shown that 36% of the respondents admitted that the convergence of KVK with other district offices is good. On the contrary, 44% of officials claimed that convergence is not good. In the meantime, 8% have no idea and 12% of the respondents stated that convergence of KVK with allied functionaries is good upto some extent.

Although KVK is to work hand in hand with the sister departments of the district like ATMA,DAO, DHO, etc. ,it is very unfortunate to say that many a times the allied functionaries are not actively cooperating with the centre.

(ii) Are you a member of Whatsapp Group meant for technical discussions created by KVK ?

Table 6.5.e.ii: Inclusion in Whatsapp Group for technical discussion

Yes	%	**No**	%
50	100	0	0

The above table indicated that 100% of the respondents are members of Whatsapp Group created for technical discussions of various agriculture issues. This platform proved to be very useful for building cordial relationships amongst the various allied functionaries.

(iii) Do you conduct meetings in which common problems faced by KVK and allied departments are discussed?

Table 6.5.e.iii: Meetings conducted for discussion of common problems

frequently	%	**sometimes**	%	**never**	%
30	60%	18	36	2	4

Data from table 6.5.e.iii had shown that 60% of the respondents admitted that they had conducted meetings in which common problems faced by KVK and allied departments are discussed. 36% of the respondents claimed that they had conducted the same meeting, while the remaining 4% never do so. Deliberations on common problems faced by different offices of the district can bring about fruitful solutions for all the participating agencies.

(iv) Do you think that various agricultural technologies disseminated by KVK Mamit has large scale adoption in the district for the upliftment of farmers of the district?

Table 6.5.e.iv: Impact of implemented agricultural technologies

Yes	%	**No**	%	**No Idea**	%
47	94	1	2	2	4

Table 6.5.e.iv indicated that 94% of respondents agreed that there is large scale adoption of agricultural technologies disseminated by KVK Mamit for upliftment of farmers of the district. Only 1% from the respondent opposed the same and 4% of respondents have no idea. This revealed that KVK Mamit district is spreading useful and feasible technologies to the farmers in their jurisdiction.

f) Constraints faced by KVK

What are the major constraints faced by KVK for helping and supporting the farmers of Mamit District?

The respondents were provided a space to scribe down few lines on the problems faced by them in the process of guiding and helping farmers. Some of the points may be highlighted below:-

The biggest problem faced by KVK Mamit is fund constraints to conduct certain important activities like OFT, FLD, various training programmes, awareness campaign, etc. Many a times, KVK is not able to support farmers for providing critical inputs such as fertilizers, seeds and irrigation facilities at the time when the farmers needed the most . Maintenance of farmers' hostel which is very crucial for campus training is also difficult due to fund constraint.

Other notable constraints identified by the respondents are lack of advanced infrastructural facilities such as animal clinic, high tech nursery, demonstration unit for poultry, piggery and dairy. Shortage of vehicle is also another limitation for the mobility of the staff especially the field staff for effective field supervision.

6.3. Analysis of Responses of the Beneficiaries to the Questionnaires

In order to obtain the effectiveness of the organisation, need is being felt to contact beneficiaries. Accordingly, the questionnaires were administered to the beneficiaries. 250 numbers of beneficiaries were contacted and series of questionnaires were framed with a view to obtain the contributions of the organisation for the welfare of farmers. The reflections of the response were as follows:

a) **How do you come to know about various agricultural welfare schemes of KVK?**

Table 6.3.A: Information about various agricultural welfare schemes of KVK

Social media		**Friends**		**Newspapers**	
Respondent	%	Respondent	%	Respondent	%
127	50.8	51	20.4	72	28.8

This question was raised with a hope to acquire information about the awareness in regard to welfare schemes. 50.8% of the respondents reflected that they come to know these schemes through social media mostly through whatsapp and facebook and another 20.4% of the respondents revealed that they heard it through friends and another 28.8% got the information from newspapers.

For the successful implementation of the important welfare schemes, it is essential that information is given to people as much as possible, make them aware about the importance and how they go about it for successful implementation of the same.

It is suggested that all the training programmes and schedules are flashed in the local newspapers, local cable networks and internet as well. In order to get the

best result, it is necessary to educate people. Therefore, awareness programmes should be conducted as much as possible. The existing fund received by KVK for awareness campaign is not sufficient enough. The success of every scheme lies so much on the awareness of the people.

b) Have you obtained important welfare schemes promulgated through KVK?

Table 6.3.B: Benefits obtained from the promulgated agricultural schemes of KVK

Yes		**No**	
Respondent	%	Respondent	%
230	92	20	8

With a hope to get information on how far the KVK schemes have an impact on the beneficiaries, the above question was raised. The above table shows that 92% of the respondents had obtained benefits from the centre such as training programmes, skill training, inputs like seeds, fertilizers, pesticides and so on. Whereas, 8% of the respondents claimed that they do not receive benefits.

c) Do you feel that KVK Mamit is doing its job for handling the various welfare measures of the farmers?

Table 6.3.C: Satisfaction about the effectiveness of KVK Mamit

Yes	%	**No**	%	**No Idea**	%
200	80	32	12.8	18	7.2

The question sought to get information on how the KVK discharges its function for the overall management and welfare of the farmers. 80% of the respondents agreed that they were positive about the functioning of KVK with

regards to transfer of technologies to the farmers. 12.8% are of the opinion that the centre is not functioning as per the mandates while 7.2% have no idea.

c) Have you acquired benefits from the centre in one way or the other?

Table 6.3.D: Satisfaction about the centre i.e. KVK Mamit

Yes	%	**No**	%	**No Idea**	%
250	100	0	0	0	0

The question was framed to obtain information on whether they benefitted from the department. 100% of the respondents agreed that they had gained benefits from the centre. It was revealed that the scientists and technical staff of KVK are very helpful in dispersing all the necessary information as well as redressing the problems of the farmers. Majority of the respondents disclosed that the staff are always ready to receive and welcome their clients anytime.

d) Do you really make use of this Centre to avail all the available / entitled welfare schemes?

Table 6.3.E: Utilisation of the centre to avail entitled welfare schemes

Yes	%	**No**	%	**No Idea**	%
231	92.4.	0	0	19	7.6

Replies to the questionnaire as reflected in the above table revealed that 92.4% respondents feel that they really make use of the centre to obtain all the available / entitled schemes. While 7.6% of the respondents had responded that they had no idea about it. This could possibly be due to lack of awareness and ignorance amongst them.

f) Write down few points on how you are not satisfied with KVK.

The reflections of the above questions may be summarised below:

The respondents revealed that KVK is provided only with one vehicle, hence it is impossible for the seven Scientists and technical staff to perform their field duties at different locations at the same time. For instance, during the outbreak of Fall Army Worm (FAW) of maize in 2019, the scientists of KVK could not combat the pest at multi locations

Due to the introduction of e-Governance, many of them (especially the illiterate farmers) find it difficult to utilise the internet facilities and they could not receive useful information, updates, field advisories, etc.

Although KVK has been promulgating useful technologies through various trainings and demonstrations to the doorsteps of the farmers, it has very limited fund for financial assistance to the farmers needed for critical agricultural inputs like seeds, fertilizers, weedicides, etc.

The respondents also pointed out that while visiting the centre for redressing their problems, they often faced food and lodging problems because the farmers' hostel is not maintained as it should be due fund constraint. They also mentioned that if other line departments like DAO, DHO, DVO are fully cooperating with KVK, it would definitely result in more output of KVK.

5.7. Conclusion

From this chapter, it can be understood the results of the analysis of responses to the questionnaire by 50 officials and 250 beneficiaries, in which the working and convergence of KVK, Mamit District with the allied functionaries were reflected. Also, effectiveness of the centre for the upliftment of farmers within the district was obtained from the opinions and responses of the beneficiaries.

CHAPTER-VII
CONCLUSION

7.1. Introduction

The present study on the organisation and working of Krishi Vigyan Kendra in Mamit District is the first of its kind. The Centre has undertaken various schemes and programmes funded mainly by ICAR for delivering services for the upliftment of farming community within the district.

7.2. Objectives of the Study

The specific objectives of the study are to-

1) examine the role and functions of KVK, Mamit District.
2) understand the organisational structure and working of KVK to achieve its objectives in Mamit District.,
3) analyse the Plans, Policies, Programmes and Schemes of the State and the Central Governments implemented by KVK, Mamit District.
4) study the different achievements made by KVK for the welfare of the farmers in Mamit District.
5) study the problems and challenges faced by KVK and suggest remedial measures for the effective functioning of KVK Centre for the development of agriculture in Mamit District.

7.3. Research Questions

The following research questions have been answered in this study:

1) What are the role and functions of KVK for the upliftment and welfare of farmers within Mamit District?
2) How is KVK, Mamit District, organisationally structured to become more effective to achieve its objectives?
3) What are the different Plans, Policies, Programmes and Schemes of the State and the Central Governments implemented by KVK, Mamit District?

4) What are the different achievements made by KVK for the welfare and upliftment of farmers in Mamit District?

5) What are the problems and challenges faced by KVK and the corresponding remedial measures suggested for the effective functioning of KVK to develop agriculture in Mamit District?

7.4. Methodology

The study is basically historical and qualitative in nature. Primary data have been collected through surveys, interviews and focus group discussions for eliciting information from fifty government functionaries like DAO, Scientists and Personnel from ATMA, NABARD and also from two hundred fifty beneficiaries. For collecting primary data, Questionnaires have also been prepared and administered to the officials, beneficiaries as well as the concerned functionaries like Village Council Members within Mamit District.

The secondary data have been collected from published and unpublished documents on the related topics, such as books, articles, journals, publication of the Government of India as well as Government of Mizoram. Web sources have also been used as the source of secondary information.

7.5.Summary of the Study

The whole study is divided into *seven*Chapters. The *first* Chapter is an introductory chapter which begins with the introduction of background of the study, the importance of agriculture for human civilization and also with the introduction about KVK whose functioning is paramount important for fostering the growth of agriculture and its allied sectors for the welfare of farming community. It also contains Review of related literature, Research Problem, Scope of the Study, Objectives of the Study, Research Questions, Methodology and Chapterisation.

The *second* Chapter on *Krishi Vigyan Kendra: A Conceptual Study*deals with the conceptual study of KVK and also focuses onthe origin, growth, unique features, principles and objectives of KVK. It also briefly gives the highlights of eight KVKs in the State of Mizoram.

The *third* Chapter on *Organisational Structure of Krishi Vigyan Kendra, Mamit District*deals with the organizational structure and the scheme of hierarchy of officers and staff ofKVKCentres in relation to the host Department, that is, Agriculture Department of Mizoram Government. It also discusses the pivotal functions and role of KVK for bringing about farmers' welfare. The administrative and financial control of the KVK Centres by the host Department and ICAR is focused in this Chapter.

In the *fourth* Chapter on *Working of KVK for Implementation of Policies, Programmes and Schemes of the Central and State Governments,*an attempt has been made to study the working of the KVK for the implementation and execution of important agricultural policies and schemes of the Central and State Governments for the welfare of the farming community of Mamit District. The aim of thisChapter is also to studyvarious on-going schemes and initiatives taken up by the Kendra with the aim of increasing farmer's income, financial support and improving their living conditions. This Chapter also discusses the convergence of KVK, Mamit District, with the allied functionaries of the district has also been briefly discussed in this Chapter.

In the *fifth* Chapter on *Achievements and Challenges of KVK, Mamit District,*an attempt has been made to find outmajor achievements made by the Centre and the challenges faced by it in the process and journey of promoting the welfare of farmers and the suggested remedial measures.

The *sixth* Chapter on *Results and Discussion* provides an analysis of the responses to the interview and the questionnaire by both the officials and the beneficiaries. Questionnaires have been framed for eliciting information to give answers to the research questions on the functions and organisation of KVK in Mamit District and different policies, schemes and programmes taken up for implementation by the organisation which has contributed to the welfare and upliftment of farmers in the district.

The *seventh* Chapter is the concluding Chapter which has brought out the summary and findings of the study in response to the research questions.

7.6. Major Findings

An attempt was made to answer the first research question*? What are the role and functions of KVK for the upliftment and welfare of farmers within Mamit District*? The KVK Mamit was sanctioned in 2005 under the directorate of Agriculture (Research and Education), Government of Mizoram and it was formally inaugurated on 31st May, 2008 at Lengpui, Mamit District, Mizoram- 796410. The staff of the KVK were recruited freshly on May, 2008. The KVK has got two demonstration farms, one is near the Office building and another one is 10 km away from the office campus. Out of the total area under the KVK (27 ha), demonstration farm covers an area of 25 ha. Presently it is performing its job fully and successfully with well-developed farms. The role and functions as narrated by the respondents, that is, seven scientists and senior scientist of KVK are summarized as follows:

1) Demonstrate the latest agricultural technologies to the farmers as well as extension workers of the State Department of Agriculture and allied to reduce the gap between the technology generation and its adoption

2) Identify the technological and training needs of the farming community of the operational area which are carried out with the help of Participatory Rural Appraisal (PRA) tools or conducting scientific survey, group interviews and personal visits

3) Test and verify the technologies in the farmers' socio-economic conditions.

4) Study the production constraints and to modify the technologies to make them appropriate as well as to demonstrate the potentialities of various technologies which are recommended for their adoption in maximizing yield or income per unit of time and area under different resource conditions.

5) Impart training to the practicing farmers/farm women, rural youths and field level extension functionaries by following the method of "Teaching by Doing" and "Learning by Doing."

The second research question is: *How is KVK, Mamit District, organisationally structured to become more effective to achieve its objectives*? Regarding this question, the answers given by the technical staff of the centre can be recapitulated as follows:

KVK, Mamit, is hosted by the State Agriculture Department to become more effective to achieve the objectives of KVK.The host organization must have the pride of ownership and possessiveness of KVKs as they are meant for helping the farming communityin enhancing the popularity and visibility of the Centre in the district. Therefore, the following Recommendations are made by the respondents to inculcate a sense of belongingness towards KVK Mamit by the host organization:

1) Available financial provisions of ICAR shall be supplemented by the host organization to develop the KVK infrastructure in such a way that the farm is a miniature of the agro-climatic situation of the district with representation of major crops and enterprises.

2) Investment and effective involvement should come from the top leadership in host organization for implementation of activities of KVK.

3) Promotion of interface in different blocks and villages of the district to build a communication strategy by involving innovative and progressive farmers and other stakeholders for enhancing awareness towards KVK.

The third research question is: *What are the different Plans, Policies, Programmes and Schemes of the State and the Central Governments implemented by KVK, Mamit District.?* Since its inception, KVK Mamit had taken up various steps to promote and help the farming community within the district. The study revealed that the centre had undertaken man schemes and projects for the benefits of farmers. Some of the important major schemes and policies implemented by the centre are Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), National Mission for Sustainable Agriculture (NMSA), Paramparagat Krishi Vikash Yojana (PKVY) , Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Mission Organic Value Chain Development for North Eastern Region (MOVCD-NER), National Mission on Oil Seeds and Oil Palm (NMOOP), Seed Village Programme , NARI- Nutri Sensitive Agricultural Resources and Innovations, Swachhta Pakhwada, Knowledge Systems and Homestead Agriculture Management in Tribal Areas (KSHAMTA) , Establishment of District Agricultural Meteorological Unit (DAMU), ‘Doubling Farmers' Income,’Soil Health Card Scheme and Capacity Development and Advisory services.

The fourth research question is:*What are the different achievements made by KVK for the welfare and upliftment of farmers in Mamit District*? An attempt was made to study the achievements of the Centre. Based on the data collected from the office of KVK by means of interview,following are the major achievements made by KVK Mamit:

1) **Testing of Technologies:**Under the mandated activities, the centre had demonstrated 83 technologies developed by various agricultural universities and agricultural research institutes.

2) **Doubling Farmers Income:** The centre had successfully implemented a pilot project of Doubling Farmers Income at Rulpuihlim village.

3) **Seed replacement of local variety of turmeric with high curcumin content variety, i.e. lakadong variety:**KVK Mamit successfully replaced the local variety of turmeric with lakadong variety and started this pilot project at Reiek RD Block with the fund received from NABARD in collaboration with Reitlang Organic Producer Company Limited (ROPCO).

4) **Combating Fall Army Worm:** In the year 2019, there was a serious outbreak of Fall Army Worm in Mizoram. Mamit district was also severely affected in which maize crops from 29 villages of the district were heavily infested by the insect pest. KVK Mamit had intervened successfully in controlling the pest by scientific management namely Integrated Pest Management (IPM).

5) **Soil Health Card:** Giving farmers' accurate utilization of fertilizers with the help of Soil Health Card Scheme. A Soil Health Card is used to assess the current state of soil health and, when used over time, to determine changes in soil health that are influenced by land management. A Soil Health Card provides soil health indicators as well as descriptive terms. The indicators are typically based on farmers' practical experience and understanding of local natural resources. KVK Mamit is equipped with soil testing laboratory since its inception. The centre had so far tested 3600 soil samples collected from the district. Based on these soil test results, 3000 soil health cards were issued to the farmers.

6) **Skill Training for Rural youth (STRY):** The government's flagship program is called Skill Development for Rural Youth. In line with the National Policy on Skill Development & Entrepreneurship 2015, the Ministry of Agriculture

& Farmers Welfare, KVK Mamit had taken up of extensive scientific training programmes to the rural youth of the district to acquire permanent income generation. Eg- pickle making, mushroom cultivation, vermicompost, bee keeping, ornamental fish rearing, poultry, piggery and composite fish culture. So far the centre had successfully trained 350 rural youths under STRY.

7) **Breeding of fish:** KVK Mamit is equipped with fish hatchery (Chinese hatchery) for breeding and multiplication of fingerlings of different species of fish. The hatchery is having production capacity of 2.5 million fingerlings in one breeding season. Every year, the centre produced fingerlings of different species such as common carp, grass carp, silver carp and Indian major carps. The uniqueness of this centre is that it is the only centre in Mizoram to have successfully bred silver barb (*Puntius gonionotus*) species in Mizoram. The silver barb is one of the five most important aquacultured freshwater species. It is a short-cycle species which can be reared with low technology and relatively less effort than other species.

8) **Introduction of new varieties of tomato:** KVK Mamit had successfully introduced high yielding and multiple disease resistant varieties of tomatoes i.e. Arka Abhed and Arka Samrat variety way back in 2021. The seeds were procured from Indian Institute of Horticultural Research (IIHR), Bangaluru. A total of 150 farmers had benefitted in the district. The success story of this crop has been popularized in other districts of the state of Mizoram and now had become the most popular variety of the state.

9) **Weather Advisory to farmers with the help of AWS (Automatic Weather Station):** Proper farming decisions are the primary benefits of anticipating the weather state of a location at a given moment. Prior weather knowledge allows farmers to make decisions that reduce expenses while increasing agricultural outputs and revenues. As a result, farmers can limit their sensitivity to excessive environmental effect. Automatic Weather Station (AWS) was installed at KVK, Lengpui in 21st December, 2020. This Automatic Weather Station (AWS) is used for real-time information on weather at the farm level. The AWS also provides information on soil moisture and soil temperature, giving better information on the irrigation requirement. Undoubtedly, AWS is a great tool in supporting the farmers.

The final research question is: *What are the problems and challenges faced by KVK and the corresponding remedial measures suggested for the effective functioning of KVK to develop agriculture in Mamit District?* The following are the major problems and challenges as well as the remedial measures suggested by different staff of the Centre.

1) **Inadequate coordination and cooperation from other associated functionaries:** Despite KVK's obligation to collaborate with sister departments, the allied functionaries frequently fail to do so.

2) KVK's agricultural research is constantly beset by the awareness that not all technologies are created equal and suitable for use in all agroclimatic zones.

3) Allied officials, host institutions, and even ICAR institutes do not view the KVKs' technology assessments as research and do not consult the KVKs in any way when making decisions about their studies.

4) **Understaffed:** The ICAR has not yet approved the hiring of MTS (multitasking staff) employees, who can run tractors, power tillers, and other equipment that will undoubtedly lighten the workload.

5) Constantly striving to meet the goals of their technical programs, the district development departments, the associated functionaries, and even the host department compromise on the KVK directives in order to do so.

6) **Limited funding from ICAR:** The ICAR only provides 18 lakh rupees a year to manage all of the activities.

7) **Lacking of advanced infrastructural facilities:** The centre is lacking various infrastructural facilities such as animal clinic, hi-tech nursery for raising horticultural crops, demonstration unit for poultry, piggery, and dairy are also not satisfactory.

8) **Issues with permanent labour:** Hiring permanent workers is not planned for in order to carry out daily fieldwork.

9) **Insufficient provision for mobility:** The centre is provided with only one office vehicle which hampers the smooth functioning of the seven scientists and other technical staff.

10) **Lack of promotion channel for the staff of KVK:** The staff recruited in KVK do not have any scope for promotional avenues. However, Career

Advancement Scheme is being provided by the host institute, i.e. Agriculture Department, Government of Mizoram.

11) **No provision for building maintenance:** There is no budgetary provision for the maintenance of the existing buildings of the Centre. It lies at the mercy of the host institute, i.e. Agriculture Department, Government of Mizoram.

12) **Insufficient revolving fund:** The centre received one time grant of only one lakh rupees as revolving fund from ICAR which is inadequate to generate income for maintenance of the farm activities. The centre had so far generated only seven lakh rupees.

13) **Inadequate funds and lack of travelling allowances:** There is a provision of only 2.5 lakhs under travelling expenses which is not sufficient to meet the expenditure incurred in connection with the travelling expenses of scientists and other staff.

14) All the staff are facing problems such as lack of provident funds, lack of retirement benefits and worried about job security. Senior Scientist and Head also reported that Subject Matter Specialists and Programme Assistants try to join some other Institutes due to the fact that there is a feeling that their job is not permanent and at the same time there is so much financial constraints that KVK staff do not get salary for 2-3 months which indirectly hampers the performance of the centre.

15) **Post of an employee shown in KVK but placed at some other places:** Recently, Subject Matter Specialist (Fishery) was transferred to KVK, Kolasib. This hinders the on-going activities under Fishery discipline as the substitute is not posted.

7.7. Suggested Remedial Measures

Corresponding to the above findings, the following remedial measures have been suggested by the researcher.

1) In Mizoram, more than 70% of the people are engaged in agriculture for their sustenance. Since KVK is the centre that works strenuously for the upliftment of the farming community, it is necessary for the allied functionaries to cooperate with it for achieving optimum results.

2) KVK should conduct more multi-locational testing of different technologies so that the technologies will be equally applicable to every agro-climatic zone.

3) While conducting assessment of technology, KVK scientists should confine themselves in following proper research methodology so that their findings will be valued by the host institute as well as ICAR.

4) Recruitment of multi-tasking staff such as tractor operators, power tiller operators, etc. which will certainly improve the field work capacity of the centre.

5) The host department and other line departments should refrain themselves from engaging KVK scientists for their technical programmes so that KVK can successfully achieve their mandated activities.

6) As the contingency fund received is only 18 lakh rupees, it is desirable that if the ICAR could increase the fund as per the demands of the centre, it would prove to result in better functioning and management of the various mandatory activities.

7) ICAR and the state government should provide more fund so that requirement of infrastructural facilities will be enhanced.

8) Creation of Group D permanent post for the fulfilment of the smooth execution of the mandated activities.

9) As mentioned earlier, the centre is provided with only one vehicle, if ICAR can increase the allotment of office vehicles, it will definitely increase the working capacity of the field staff.

10) The staff of KVK, both clerical and technical, do not have any promotional avenue during their entire career. Therefore, it is the need of the hour for the ICAR to make new provisions for promotion in order to boost their morale.

11) The administrative buildings, farmer hostels and staff quarters are constructed 15 years ago and they have started deteriorating. Renovation of these buildings is urgently required.

12) An additional amount of at least rupees 10 lakhs maybe provided by ICAR as an incentive so as to generate more income from the existing revolving fund.

13) Provision of at least 9 lakh rupees as travelling allowances will enable the staff of KVK to perform their out-station duties satisfactorily.

14) Securities such as Provident fund and Pension Benefits should also be facilitated to the staff of KVK as truly deserved by them, so that they will have a sense of belongingness to KVK and will not aspire to join other institutes.

15) In future, the host institute should not transfer the technical staff while he is engaging with important on-going research works.

7.8. Limitations of the Study

The Scholar admits that the usefulness of the study is counterbalanced by several limitations. There is no precedent on the study of Organisation and Working of Krishi Vigyan Kendra. Theoretically, the scholar finds it difficult to trace secondary data such as books and journals relating to Krishi Vigyan Kendra in Mizoram. The subject of Krishi Vigyan Kendra in Mizoram is a difficult topic left untouched by writers and scholars. In the wider context of searching secondary sources outside the State, the scholar also finds difficulty in locating relevant materials. Such being the case, the scholar spent seven months with the staff of Krishi Vigyan Kendra to interact, interview and accompany them to field visits.

The scholar finds practical limitations in assessing the level of convergence between KrishiVigyan Kendra and Allied Departments in the district. The concept of convergence sounds ambiguous and difficult to comprehend for official functionaries of KVK as well as farmers in the area of study.

7.9. Scope for Further Research

The findings of the researcher and the limitations of the study so identified by him haveuncovered new scope for further research in the area of Krishi Vigyan Kendra. Therefore, few areas of research can be pursued further such as –

1) A comparative study of two or more KVKs- Since the present research work is confined to one KVK only, it is felt necessary to do further Research pertaining to a comparative study of two or more KVKs within the state or interstate.

2) The study finds that women contribute significant work force in agriculture and allied sector. Substantial numbers of respondents, that is, 25 percent of respondents, are woman farmers who were being often neglected and side-lined as there is an absence of specific women-centric schemes and programmes in schemes and programmes of KVK. An empirical study towards role of women in KVK is an area of research that needs to be undertaken in future.

3) The study revealed that 98 percent of the respondents have personal access to mobile internet. KVK Mamit handled advisory services such as Weather Advisory, crop advisory and Animal Husbandry in which the vital information for the farmers are disseminated through mobile phones .Now, there are various agricultural schemes and programmes such as PM Kisan, Soil Health Card , NARI, KSHAMTA that can be benefitted from the internet services. In the meantime, there are many farmers who are still digital illiterate to fully utilize the service rendered by KVK Mamit. Therefore, it is the need of the hour to conduct further research on this aspect.

APPENDIX – I

Ph.D. RESEARCH

ON

ORGANISATION AND WORKING OF KRISHI VIGYAN KENDRA IN MAMIT DISTRICT, MIZORAM

Questionnaire for Officials of Krishi Vigyan Kendra, Mamit District & Allied Functionaries

1. The success and development of Agriculture and Allied sector hugely depends on the official functionaries of Krishi Vigyan Kendra and Allied Functionaries in Mamit District. It is vital to consider their views and opinions as they are the executing arms and legs at the field level.

2. This questionnaire is administered purely for academic purposes having no connection whatsoever with departments of the State Government.

3. There is no means to identify the respondent. As a result, the respondent is encouraged to answer freely on the basis of one's true opinions and experiences.

SAMUEL LALRAMDIKA HNAMTE
Research Scholar

DEPARTMENT OF PUBLIC ADMINISTRATION
MIZORAM UNIVERSITY
TANHRIL

Questions for officials relating to the funding pattern for the smooth functioning and management of the office

i) Do you think KVK has received adequate fund from ICAR for the management of mandated activities?

Yes No No Idea

Questions relating to sufficiency of man-power in the organisation.

i) Do you think KVK is provided with sufficient man-power to cater the overall welfare of farmers of the district?

Yes No No Idea

Impact of various schemes implemented by KVK for the welfare and benefit of farmers

i) Do you think that various schemes implemented by KVK have an impact/benefits for the upliftment of the farmers of the district?

Yes No No Idea

Convergence

i) Is the convergence of KVK with other allied district offices like ATMA,DAO etc. good enough for the progress of agriculture as well as the upliftment of farmers of the district ?

Yes No No Idea To some extend

ii) Are you a member of Whatsapp Group meant for technical discussions created by KVK?

Yes No

iii) Do you conduct meetings in which common problems faced by KVK and Allied departments are discussed?

Frequently Sometimes Never

iv) Do you think that various agricultural technologies disseminated by KVK Mamit has large scale adoption in the district for the upliftment of farmers of the district?

Yes No No Idea

Constraints faced by KVK

i) What are the major constraints faced by KVK for helping and supporting the farmers of Mamit District?

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APPENDIX – II

Ph.D. RESEARCH

ON

ORGANISATION AND WORKING OF KRISHI VIGYAN KENDRA IN MAMIT DISTRICT, MIZORAM

Questionnaire for Beneficiaries i.e. Farmers within Mamit District

i) Farmers are the major stake holder in the process of administering agriculture and allied services. It is vital to consider the views and opinions of the concern farmers and not only depend on the opinions of the official functionaries.

ii) This questionnaire is administered purely for academic purposes having no connection whatsoever with departments of the State Government.

iii) There is no means to identify the respondent. As a result, the respondent is encouraged to answer freely on the basis of one's true opinions and experiences.

SAMUEL LALRAMDIKA HNAMTE
Research Scholar

DEPARTMENT OF PUBLIC ADMINISTRATION
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TANHRIL

QUESTIONNAIRE FOR BENEFICIARIES

i) How do you come to know about various agricultural welfare schemes of KVK?

Social Media Friends Newspapers

ii) Have you obtained important welfare schemes promulgated through KVK?

Yes No

iii) Do you feel that KVK Mamit is doing its job for handling the various welfare measures of the farmers?

Yes No No Idea

iv) Have you acquired benefits from the centre in one way or the other?

Yes No No Idea

v) Do you really make use of this centre to avail all the available / entitled welfare schemes?

Yes No No Idea

vi) Write down few points on how you are not satisfied with KVK.

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APPENDIX III

LIST OF HEADS OF OFFICES / INSTITUTIONS			
MAMIT DISTRICT			
SN	**Designation & Department**		**Present Incumbent**
1.	Deputy Commissioner	:	V.L. Remliana
2.	Superintendent of Police	:	Lalthangpuii Pulamte
3.	Addl. District & Session Judge	:	R. Vanlalena
4.	Superintending Engineer, PHE	:	HB Chakma
5.	Superintending Engineer, P & E	:	Lalzorama
6.	Project Director, DRDA	:	Ethel Rothangpuii
7.	Principal, Govt. Champhai College	:	P. Lalhmingliana
8.	District Transport Officer	:	Zoremthara Ralte
9.	Dist. Local Administrative Officer	:	K. Lalhmuakliana
10.	Dist. Urban Development Officer, UD & PA	:	K. Lalhmuakliana
11.	Executive Engineer, PWD	:	Vanlaldika
12.	Executive Engineer I & W Revenue Department	:	Laldingliana Hrahsel
13.	Dist. Programme Officer, Social Welfare	:	H. Zaimawii
14.	Chief Medical Officer	:	Dr. R. Lalawmpuia
15.	District Civil Supplies Officer	:	Lalthanmawia
16.	Settlement Officer	:	Lalnunfela Chawngthu
17.	Block Development Officer, Reiek	:	R. Lalrinzuali, MCS
18.	Block Development Officer, Zawlnuam	:	H. Vanlalbiakzauva, MCS
19.	Block Development Officer, West Phaileng	:	Dr. Saithangpuia, MCS
20.	Medical Superintendent	:	Dr. Zatluanga
21.	Divisional Forest Officer	:	C. Lalbiaka
22.	District Agriculture Officer	:	George Lalthangmawia
23.	Dist. Labour & Employment Officer i/c	:	Lalremruata
24.	District Education Officer	:	C. Lalbiakzauva
25.	District Sericulture Officer	:	B. Lalchhuana
26.	Dist. Sports & Youth Officer	:	Lalnunfela Chawngthu
27.	Dist. AH & Vety Officer	:	Dr. M. Zohmingthangi
28.	District Treasury Officer	:	Lalchhuanliana Sailo

LIST OF HEADS OFOFFICES / INSTITUTIONS			
MAMIT DISTRICT			
SN	**Designation & Department**		**Present Incumbent**
29.	District Sericulture Officer	:	B. Lalchhuana
30.	Dist. Sports & Youth Officer	:	Lalnunfela Chawngthu
31.	Dist. AH & Vety Officer	:	Dr. M. Zohmingthangi
32.	District Treasury Officer	:	Lalchhuanliana Sailo
33.	District Fisheries Development Officer	:	Lucy Lalrinpuii
34.	Information & Public Relations Officer	:	Dr. Lallawmkima
35.	Dist. Child Protection Officer	:	R. Lalrinchhani
36.	District Research Officer, Eco & Stats	:	B. Lalrinhlua
37.	Dist. Marketing Officer, Commerce & Industries	:	B. Zoramchhana
38.	District Librarian	:	Zothanglawra
39.	District Agriculture Officer	:	T. Lalhmingmawia
40.	District Horticulture Officer	:	B. Lalzarliana
41.	Assistant Commissioner of Excise & Narcotics	:	B. Zoliana
42.	Deputy Commissioner of Tac	:	P. Lalrinmawia
43.	Asst. Registrar, Co-operative Society	:	C. Lalbethlehema
44.	Superintendent District Jail	:	Zosangliana
45.	Functional Manager, Dist. Industries Centre	:	Lalrinawma
46.	RO, Land Resources Soil & Water Conservation	:	Lalrozama
47.	Asst. Controller, Legal Metrology	:	V. Lalfakzuala
48.	Asst. Tourist Officer	:	K. Lalhlimpuia
49.	Dy. Central Intelligent Officer, SB	:	G. Vanlalmalsawma
50.	Manager SBI	:	Pauthianmung Tombing
51.	Manager, MCAB	:	Rozamliana
52.	Manager, Mizoram Rural Bank	:	P. Lalzuiliana
53.	Superintendent, Custom Prevention Force	:	Robert Lotha
54.	Superintendent, Land Custom Stations	:	J. Lophul
55.	Junior Telecom Officer	:	Lalremruatthanga
56.	Officer Comanding, 74RCC	:	RK Prakash
57.	Chief Manager, Lead Bank	:	SP. Sharmah
58.	Post Master	:	Lalrintluanga

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DATE OF ADMISSION	:	03.11.2020

APPROVAL OF RESEARCH PROPOSAL :

1. BOARD OF STUDIES : 05.05.2021
2. SCHOOL BOARD : 18.05.2021

MZU REGISTRATION NO. : 2065 of 2010-11

PH.D. REGISTRATION NO. & DATE : MZU/Ph.D./1495 of 03.11.2020

Date: March, 2024 (PROF. SRINIBAS PATHI)

ABSTRACT

ORGANISATION AND WORKING OF KRISHI VIGYAN KENDRA IN MAMIT DISTRICT, MIZORAM

AN ABSTRACT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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DEPARTMENT OF PUBLIC ADMINISTRATION

SCHOOL OF SOCIAL SCIENCES

MARCH, 2024

ORGANISATION AND WORKING OF KRISHI VIGYAN KENDRA IN MAMIT DISTRICT, MIZORAM

BY

SAMUEL LALRAMDIKA HNAMTE

DEPARTMENT OF PUBLIC ADMINISTRATION

Supervisor: Prof. Lalrintluanga

Submitted

In partial fulfilment of the requirement of the Degree of Doctor of Philosophy in Public Administration of Mizoram University, Aizawl.

ABSTRACT OF THE THESIS

1.1. Introduction

Agriculture was a key tool in the rise of sedentary human civilization, as farming of domesticated species resulted in food surpluses that fostered and nurtured civilization's development. The history of Agriculture's history dates back thousands of years, and its evolution has been greatly influenced by climatic conditions, cultural aspects, and technological inputs. However, all farming relies on specific techniques, tools, and equipment to expand and maintain the lands in order to raise domesticated species in a sustainable manner.

Krishi Vigyan Kendras (KVKs) in the states focus on testing and introduction of suitable and viable technologies to achieve the targets set forth and create developing agricultural sector. For sustainable development, the tailor-made action programmes to garner the need of precision farming and organic agriculture have to be visualized where the KVKs will play the prominent role. Horticulture and Floriculture have tremendous potential and will greatly expand the agricultural economy while animal Husbandry will help retain scarce financial resources within the state. The KVKs as “Knowledge Centres,” have to link up with public-private partnership in a workable manner to sustain the envisioned development of all agriculture and allied sectors.

1.2. Objectives of the Study

The specific objectives of the study are to-

1) examine the role and functions of KVK, Mamit District.
2) understand the organisational structure and working of KVK to achieve its objectives in Mamit District.,
3) analyse the Plans, Policies, Programmes and Schemes of the State and the Central Governments implemented by KVK, Mamit District.

4) study the different achievements made by KVK for the welfare of the farmers in Mamit District.

5) study the problems and challenges faced by KVK and suggest remedial measures for the effective functioning of KVK Centre for the development of agriculture in Mamit District.

1.3. Scope of the Study

The proposed study will focus on the organisational structure and working of the KVK with a special focus on the administration of KVK for the welfare and upliftment of the farmers within Mamit District. However, efforts will also be made to study the growth and development of KVK, Mamit District in Mizoram. The study will also analyse the Policies, Programmes and Schemes (Centrally Sponsored Schemes and State Schemes) implemented by KVK and highlight the problems and challenges faced by KVI Centre and the farmers while addressing agricultural problems. Corresponding to the problems and challenges so identified, remedial measures will be suggested for the development of agriculture for the welfare of the people in general and the famers in particular.

1.4. Research Gap

The above published works under review have not specifically dealt with Krishi Vigyan Kendras (KVKs) in Mizoram. In fact, most of the works under review have covered studies of Agriculture in other parts of India in general without specifically studying KVK in Mizoram which has recently received the National Award from the President of India in recognition of its significant contribution for promoting the welfare of the farmers in Mizoram. Hence, the present researcher has taken up this area for the study.

1.5. Statement of the Problem

The objective of the KVK is to work on assessment, refinement and transfer of agricultural and allied technologies and transfer of skill through training in agriculture and allied sectors for the farmers of the district.Accordingly, KVK for Mamit District was inaugurated on 31st May'2008 at Lengpui with the aforesaid objective to improve the socio-economic condition of the farming community and to accelerate the agricultural production.

Mamit District is one of the young districts of Mizoram whose economic base is largely dependent on agriculture and its allied sectors. The major crops grown by the farmers in the district are rice, maize, sugarcane, bird's eye chillies, ginger and vegetables like tomatoes, cabbages, beans, etc. Since its inauguration as a district level farm science centre, KVK, Mamit District, has been provided with proper organisational structure to fulfil its objectives to address and overcome the challenges faced by the farmers. The Officers & staff of KVK, from Lengpui moved to action to bring forth changes to the farming community of Mamit District and undertook different activities like trainings, farm demonstrations, animal camps, on and off campus trainings, detailed survey of Mamit Districts. Thus, KVK, Mamit District, plays a very vital role in imparting training to the farmers, transferring and imparting technology to the farmers for the improvement of agricultural productivity.

While agriculture can play a vital role in the economic development of the district, there arebasic factors adversely affecting the working of KVK, Mamit District, such as soil exhaustion, the vagaries of nature and lack of the required knowledge of technologies by the farmers for agricultural development. All these drawbacks have prompted KVK to impart proper trainings to the farmers.

Despite intensive and lengthy efforts played by KVK throughout the district, the farmers are still facing a huge yield gap from time to time. The major challenges faced by the farmers are lack of proper irrigation especially during the Rabi seasons, pests attack like Fall Army Worm, big competitors regarding the market

supply chain from outside the state as well as within the state, loss of fertile land holdings due to shifting cultivation, etc.

The other problems faced by majority of the farmers are poor access to reliable and timely market information, absence of supply and demand forecasting, poorly structured and inefficient supply chains, inadequate cold storage facilities and shortage of proper food processing units, large intermediation between the farmers and the consumers.

Briefly, it has been felt necessary to make an in-depth study of the functions, role and working of KVK, Mamit District for agricultural development for the welfare of the farmers. Therefore the proposed study will try to provide an overview of the functioning of KVK and identify the problems and challenges encountered by it in the delivery mechanism of agriculture technology to the farmers. The study will also give suggestions that may contribute towards solutions of the problems and meet the challenges so identified.

1.6. Methodology

The study is basically historical and qualitative in nature. Primary data have been collected through surveys, interviews and focus group discussions for eliciting information from fifty government functionaries like DAO, Scientists and Personnel from ATMA, NABARD and also from two hundred fifty beneficiaries. For collecting primary data, Questionnaires have also been prepared and administered to the officials, beneficiaries as well as the concerned functionaries like Village Council Members within Mamit District.

The secondary data have been collected from published and unpublished documents on the related topics, such as books, articles, journals, publication of the

Government of India as well as Government of Mizoram. Web sources have also been used as the source of secondary information.

1.7. Chapterisation

The whole study is divided into *seven* Chapters. The *first* Chapter is an introductory chapter which begins with the introduction of background of the study, the importance of agriculture for human civilization and also with the introduction about KVK whose functioning is paramount important for fostering the growth of agriculture and its allied sectors for the welfare of farming community. It also contains Review of related literature, Research Problem, Scope of the Study, Objectives of the Study, Research Questions, Methodology and Chapterisation.

The *second* Chapter on *Krishi Vigyan Kendra: A Conceptual Study* deals with the conceptual study of KVK and also focuses on the origin, growth, unique features, principles and objectives of KVK. It also briefly gives the highlights of eight KVKs in the State of Mizoram.

The *third* Chapter on *Organisational Structure of Krishi Vigyan Kendra, Mamit District* deals with the organizational structure and the scheme of hierarchy of officers and staff of KVK Centres in relation to the host Department, that is, Agriculture Department of Mizoram Government. It also discusses the pivotal functions and role of KVK for bringing about farmers' welfare. The administrative and financial control of the KVK Centres by the host Department and ICAR is focused in this Chapter.

In the *fourth* Chapter on *Working of KVK for Implementation of Policies, Programmes and Schemes of the Central and State Governments,* an attempt has been made to study the working of the KVK for the implementation and execution of important agricultural policies and schemes of the Central and State Governments for the welfare of the farming community of Mamit District. The aim

of this Chapter is also to study various on-going schemes and initiatives taken up by the Kendra with the aim of increasing farmer's income, financial support and improving their living conditions. This Chapter also discusses the convergence of KVK, Mamit District with the allied functionaries of the district has also been briefly discussed in this Chapter.

In the *fifth* Chapter on *Achievements and Challenges of KVK, Mamit District,* an attempt has been made to find out major achievements made by the Centre and the challenges faced by it in the process and journey of promoting the welfare of farmers and the suggested remedial measures.

The *sixth* Chapter on *Results and Discussion* provides an analysis of the responses to the interview and the questionnaire by both the officials and the beneficiaries. Questionnaires were framed for eliciting information to give answers to the research questions on the functions and organisation of KVK in Mamit District and different policies, schemes and programmes taken up for implementation by the organisation which has contributed to the welfare and upliftment of farmers in the district.

The *seventh* Chapter is the concluding Chapter which has brought out the summary and findings of the study in response to the research questions.

1.8. Major Findings

Following are the major findings of this research works corresponding to the research questions:

An attempt was made to answer the first research question*? What are the role and functions of KVK for the upliftment and welfare of farmers within Mamit District*? The KVK Mamit was sanctioned in 2005 under the directorate of Agriculture (Research and Education), Government of Mizoram and it was formally inaugurated on 31st May, 2008 at Lengpui, Mamit District, Mizoram- 796410. The staff of the KVK were

recruited freshly on May, 2008. The KVK has got two demonstration farms, one is near the Office building and another one is 10 km away from the office campus. Out of the total area under the KVK (27 ha), demonstration farm covers an area of 25 ha. Presently it is performing its job fully and successfully with well-developed farms. The role and functions as narrated by the respondents, that is, seven scientists and senior scientist of KVK are summarized as follows:

1) Demonstrate the latest agricultural technologies to the farmers as well as extension workers of the State Department of Agriculture and allied to reduce the gap between the technology generation and its adoption

2) Identify the technological and training needs of the farming community of the operational area which are carried out with the help of Participatory Rural Appraisal (PRA) tools or conducting scientific survey, group interviews and personal visits

3) Test and verify the technologies in the farmers' socio-economic conditions.

4) Study the production constraints and to modify the technologies to make them appropriate as well as to demonstrate the potentialities of various technologies which are recommended for their adoption in maximizing yield or income per unit of time and area under different resource conditions.

5) Impart training to the practicing farmers/farm women, rural youths and field level extension functionaries by following the method of "Teaching by Doing" and "Learning by Doing."

The second research question is: *How is KVK, Mamit District, organisationally structured to become more effective to achieve its objectives*? Regarding this question, the answers given by the technical staff of the centre can be recapitulated as follows:

KVK, Mamit, is hosted by the State Agriculture Department to become more effective to achieve the objectives of KVK. The host organization must have the pride of ownership and possessiveness of KVKs as they are meant for helping the farming community in enhancing the popularity and visibility of the Centre in the district.

Therefore, the following Recommendations are made by the respondents to inculcate a sense of belongingness towards KVK Mamit by the host organization:

1) Available financial provisions of ICAR shall be supplemented by the host organization to develop the KVK infrastructure in such a way that the farm is a miniature of the agro-climatic situation of the district with representation of major crops and enterprises.

2) Investment and effective involvement should come from the top leadership in host organization for implementation of activities of KVK.

3) Promotion of interface in different blocks and villages of the district to build a communication strategy by involving innovative and progressive farmers and other stakeholders for enhancing awareness towards KVK.

The third research question is: *What are the different Plans, Policies, Programmes and Schemes of the State and the Central Governments implemented by KVK, Mamit District.?* Since its inception, KVK Mamit had taken up various steps to promote and help the farming community within the district. The study revealed that the centre had undertaken man schemes and projects for the benefits of farmers. Some of the important major schemes and policies implemented by the centre are Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), National Mission for Sustainable Agriculture (NMSA), Paramparagat Krishi Vikash Yojana (PKVY) , Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Mission Organic Value Chain Development for North Eastern Region (MOVCD-NER), National Mission on Oil Seeds and Oil Palm (NMOOP), Seed Village Programme , NARI- Nutri Sensitive Agricultural Resources and Innovations, Swachhta Pakhwada, Knowledge Systems and Homestead Agriculture Management in Tribal Areas (KSHAMTA) , Establishment of District Agricultural Meteorological Unit (DAMU), 'Doubling Farmers' Income,' Soil Health Card Scheme and Capacity Development and Advisory services.

The fourth research question is: *What are the different achievements made by KVK for the welfare and upliftment of farmers in Mamit District*? An attempt was made to study the achievements of the Centre. Based on the data collected from the office of

KVK by means of interview, following are the major achievements made by KVK Mamit:

1) **Testing of Technologies:** Under the mandated activities, the centre had demonstrated 83 technologies developed by various agricultural universities and agricultural research institutes.

2) **Doubling Farmers Income:** The centre had successfully implemented a pilot project of Doubling Farmers Income at Rulpuihlim village.

3) **Seed replacement of local variety of turmeric with high curcumin content variety, i.e. lakadong variety:** KVK Mamit successfully replaced the local variety of turmeric with lakadong variety and started this pilot project at Reiek RD Block with the fund received from NABARD in collaboration with Reitlang Organic Producer Company Limited (ROPCO).

4) **Combating Fall Army Worm:** In the year 2019, there was a serious outbreak of Fall Army Worm in Mizoram. Mamit district was also severely affected in which maize crops from 29 villages of the district were heavily infested by the insect pest. KVK Mamit had intervened successfully in controlling the pest by scientific management namely Integrated Pest Management (IPM).

5) **Soil Health Card:** Giving farmers' accurate utilization of fertilizers with the help of Soil Health Card Scheme. A Soil Health Card is used to assess the current state of soil health and, when used over time, to determine changes in soil health that are influenced by land management. A Soil Health Card provides soil health indicators as well as descriptive terms. The indicators are typically based on farmers' practical experience and understanding of local natural resources. KVK Mamit is equipped with soil testing laboratory since its inception. The centre had so far tested 3600 soil samples collected from the district. Based on these soil test results, 3000 soil health cards were issued to the farmers.

6) **Skill Training for Rural youth (STRY):** The government's flagship program is called Skill Development for Rural Youth. In line with the National Policy on Skill Development & Entrepreneurship 2015, the Ministry of Agriculture & Farmers

Welfare, KVK Mamit had taken up of extensive scientific training programmes to the rural youth of the district to acquire permanent income generation. Eg- pickle making, mushroom cultivation, vermicompost, bee keeping, ornamental fish rearing, poultry, piggery and composite fish culture. So far the centre had successfully trained 350 rural youths under STRY.

7) **Breeding of fish:** KVK Mamit is equipped with fish hatchery (Chinese hatchery) for breeding and multiplication of fingerlings of different species of fish. The hatchery is having production capacity of 2.5 million fingerlings in one breeding season. Every year, the centre produced fingerlings of different species such as common carp, grass carp, silver carp and Indian major carps. The uniqueness of this centre is that it is the only centre in Mizoram to have successfully bred silver barb (*Puntius gonionotus*) species in Mizoram. The silver barb is one of the five most important aquacultured freshwater species. It is a short-cycle species which can be reared with low technology and relatively less effort than other species.

8) **Introduction of new varieties of tomato:** KVK Mamit had successfully introduced high yielding and multiple disease resistant varieties of tomatoes i.e. Arka Abhed and Arka Samrat variety way back in 2021. The seeds were procured from Indian Institute of Horticultural Research (IIHR), Bangaluru. A total of 150 farmers had benefitted in the district. The success story of this crop has been popularized in other districts of the state of Mizoram and now had become the most popular variety of the state.

9) **Weather Advisory to farmers with the help of AWS (Automatic Weather Station):** Proper farming decisions are the primary benefits of anticipating the weather state of a location at a given moment. Prior weather knowledge allows farmers to make decisions that reduce expenses while increasing agricultural outputs and revenues. As a result, farmers can limit their sensitivity to excessive environmental effect. Automatic Weather Station (AWS) was installed at KVK, Lengpui in 21st December, 2020. This Automatic Weather Station (AWS) is used for real-time information on weather at the farm level. The AWS also provides information on soil

moisture and soil temperature, giving better information on the irrigation requirement. Undoubtedly, AWS is a great tool in supporting the farmers.

The final research question is: *What are the problems and challenges faced by KVK and the corresponding remedial measures suggested for the effective functioning of KVK to develop agriculture in Mamit District?* The following are the major problems and challenges as well as the remedial measures suggested by different staff of the Centre.

1) **Inadequate coordination and cooperation from other associated functionaries:** Despite KVK's obligation to collaborate with sister departments, the allied functionaries frequently fail to do so.

2) KVK's agricultural research is constantly beset by the awareness that not all technologies are created equal and suitable for use in all agro-climatic zones.

3) Allied officials, host institutions, and even ICAR institutes do not view the KVKs' technology assessments as research and do not consult the KVKs in any way when making decisions about their studies.

4) **Understaffed:** The ICAR has not yet approved the hiring of MTS (multitasking staff) employees, who can run tractors, power tillers, and other equipment that will undoubtedly lighten the workload.

5) Constantly striving to meet the goals of their technical programs, the district development departments, the associated functionaries, and even the host department compromise on the KVK directives in order to do so.

6) **Limited funding from ICAR:** The ICAR only provides 18 lakh rupees a year to manage all of the activities.

7) **Lacking of advanced infrastructural facilities:** The centre is lacking various infrastructural facilities such as animal clinic, hi-tech nursery for raising horticultural crops, demonstration unit for poultry, piggery, and dairy are also not satisfactory.

8) **Issues with permanent labour:** Hiring permanent workers is not planned for in order to carry out daily fieldwork.

9) **Insufficient provision for mobility:** The centre is provided with only one office vehicle which hampers the smooth functioning of the seven scientists and other technical staff.

10) **Lack of promotion channel for the staff of KVK:** The staff recruited in KVK do not have any scope for promotional avenues. However, Career Advancement Scheme is being provided by the host institute, i.e. Agriculture Department, Government of Mizoram.

11) **No provision for building maintenance:** There is no budgetary provision for the maintenance of the existing buildings of the Centre. It lies at the mercy of the host institute, i.e. Agriculture Department, Government of Mizoram.

12) **Insufficient revolving fund:** The centre received one time grant of only one lakh rupees as revolving fund from ICAR which is inadequate to generate income for maintenance of the farm activities. The centre had so far generated only seven lakh rupees.

13) **Inadequate funds and lack of travelling allowances:** There is a provision of only 2.5 lakhs under travelling expenses which is not sufficient to meet the expenditure incurred in connection with the travelling expenses of scientists and other staff.

14) All the staff are facing problems such as lack of provident funds, lack of retirement benefits and worried about job security. Senior Scientist and Head also reported that Subject Matter Specialists and Programme Assistants try to join some other Institutes due to the fact that there is a feeling that their job is not permanent and at the same time there is so much financial constraints that KVK staff do not get salary for 2-3 months which indirectly hampers the performance of the centre.

15) **Post of an employee shown in KVK but placed at some other places:** Recently, Subject Matter Specialist (Fishery) was transferred to KVK, Kolasib. This hinders the on-going activities under Fishery discipline as the substitute is not posted.

1.9. Suggested Remedial Measures

Corresponding to the above findings, the following remedial measures have been suggested by the researcher.

1) In Mizoram, more than 70% of the people are engaged in agriculture for their sustenance. Since KVK is the centre that works strenuously for the upliftment of the farming community, it is necessary for the allied functionaries to cooperate with it for achieving optimum results.

2) KVK should conduct more multi-locational testing of different technologies so that the technologies will be equally applicable to every agro-climatic zone.

3) While conducting assessment of technology, KVK scientists should confine themselves in following proper research methodology so that their findings will be valued by the host institute as well as ICAR.

4) Recruitment of multi-tasking staff such as tractor operators, power tiller operators, etc. which will certainly improve the field work capacity of the centre.

5) The host department and other line departments should refrain themselves from engaging KVK scientists for their technical programmes so that KVK can successfully achieve their mandated activities.

6) As the contingency fund received is only 18 lakh rupees, it is desirable that if the ICAR could increase the fund as per the demands of the centre, it would prove to result in better functioning and management of the various mandatory activities.

7) ICAR and the state government should provide more fund so that requirement of infrastructural facilities will be enhanced.

8) Creation of Group D permanent post for the fulfilment of the smooth execution of the mandated activities.

9) As mentioned earlier, the centre is provided with only one vehicle, if ICAR can increase the allotment of office vehicles, it will definitely increase the working capacity of the field staff.

10) The staff of KVK, both clerical and technical, do not have any promotional avenue during their entire career. Therefore, it is the need of the hour for the ICAR to make new provisions for promotion in order to boost their morale.

11) The administrative buildings, farmer hostels and staff quarters are constructed 15 years ago and they have started deteriorating. Renovation of these buildings is urgently required.

12) An additional amount of at least rupees 10 lakhs maybe provided by ICAR as an incentive so as to generate more income from the existing revolving fund.

13) Provision of at least 9 lakh rupees as travelling allowances will enable the staff of KVK to perform their out-station duties satisfactorily.

14) Securities such as Provident fund and Pension Benefits should also be facilitated to the staff of KVK as truly deserved by them, so that they will have a sense of belongingness to KVK and will not aspire to join other institutes.

15) In future, the host institute should not transfer the technical staff while he is engaging with important on-going research works.

1.10 Conclusion

In conclusion, Agriculture has given so much to society. But it has its own pros and cons that we can't overlook. Furthermore, the government is doing its every bit to help in the growth and development of agriculture, but still, it needs to do something for the negative impacts of agriculture. Krishi Vigyan Kendras commonly known as KVKs are the agricultural science centres established as innovative institutions for imparting vocational training to the practicing farmers, school dropouts and filed level extension functionaries. It is an integral part of the National Agricultural Research System (NARS), aims at assessment of location specific technology modules in agriculture and allied enterprises, through technology assessment, refinement and demonstrations. It is obvious that the prime goal of KVK is to impart training as per needs and requirements in agriculture and allied enterprises to all farmers so as to uplift and help them to accomplish sustainability in the field of agriculture.

It can be concluded that Krishi Vigyan Kendras provide requisite knowledge through trainings and other activities to improve the skill and attitude of the people towards a particular subject, provide proper guidance to solve any problem faced by the farming community in agriculture and allied fields.