

Horticultural Development within Serchhip District under the RKVY Program

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Abstract

Horticulture seems to get more attention and recognition in Mizoram. This is due to the growing health consciousness among the people, economic viability and feasibility of the horticulture crops, suitability of soil of the land etc. The topography of the state also has a significant contribution for the development of horticulture as large scale industries could not be set up due to the absence of vast flat land and scarcity of mineral resources, power etc. However, the climatic conditions and soil composition of Mizoram is found to be suitable for the cultivation of a vast variety of horticulture crops. Farmers in different regions are slowly weaning away from the age-old practice of Jhum cultivation which is detrimental to the environment and are moving towards permanent farming where they can grow more profitable crops with more environment friendly activities without having to shift and clear new plots every year. Even before the introduction of various Central and State horticulture programs and projects, horticulture occupied a very important place in the lives of the people of Mizoram. The Mizos used to be self-sufficient in foodgrains, fruits and vegetables. They grew most of the horticulture crops that are grown today but at a rather less commercial level. Most crops they grew were for their consumption alone. They hardly thought of making profits. However during those days, they gave more emphasis on cereals particularly rice which is the staple food item of the Mizos since time immemorial.

Keywords: Horticulture, growing, development, cultivation environment, activities, programs, commercial.

Introduction

Horticulture (Latin hortus = garden; cultura = cultivation), is the science and art of growing fruits, vegetables, flowers, shrubs and trees¹. It originally meant the practice of gardening and, by extension, now means the cultivation of plants once grown in gardens. It includes the growing of fruits (especially tree fruits), production of vegetable crops, production of flowers, and ornamental horticulture, known as landscaping gardening, which includes the maintenance and design of home grounds, public gardens and parks, private estates, botanical gardens, and recreational areas such as golf courses, football fields and baseball diamonds

The most advanced countries in the field of modern horticulture are the following: - in Europe, the Netherlands, Germany, France, Belgium and the United Kingdom: in Americas, the United States: in Africa, South Africa: and in Australasia, Australia, Tasmania and New Zealand. In recent years India, Japan, China and Russia have extended their horticultural crop production².

The history of horticulture is traced as it gradually developed independent of agriculture, into the sophisticated art and science that it is today. Its separation from agriculture as a distinct activity is usually dated from the Middle Ages in Europe. The history and evolution of horticulture is intimately connected to the history and development of agriculture. As such, horticulture is part of the story of humanity's desire to gain control over nature. Although horticulture and agriculture have many practices in common, horticulture is distinguished by its specialized practices, for example grafting, and by the smaller scale of its operation³.

With the changing lifestyle and food habit, the importance of vegetables and fruits in the human diet is being increasingly realized. Owing to the varied agro-climatic zones, abundance of natural resources like sunlight and water, existence of large number of small and marginal farmers and technology available for their production, India has considerable potential to increase its production of horticultural crops⁴. It is the fastest growing sector within agriculture. It contributes to poverty alleviation, nutritional security and provides ample scope for farmers to increase their income. It further helps in sustaining

¹ Singh, Bijender, (2009), *Horticulture at a glance*, New Delhi: Kalyani Publishers, pp.1.

² Prasad, S., and Kuma, U., (2005), *Principles of Horticulture*, Jodhpur: Agrobios, pp.1.

³ <https://www.eolss.net/sample-chapters/c09/e6-156-07-00.pdf> accessed on 16. 12. 2018

⁴ Singh, S.B., Prakash, N., and SV Ngachan, S.V., (2011), *New Perspective on Marketing of Horticultural Crops in North East India*, New Delhi: Today and Tomorrow's Printer and Publishers, pp.1.

large number of agro-based industries which generate huge employment opportunities. Presently horticulture contributes 28 per cent of agricultural Gross Domestic Product (GDP). The national goal of achieving 4.0 per cent growth in agriculture can be achieved through major contribution from horticulture growth⁵.

STATEMENT OF THE PROBLEM

As with the rest of the country, agriculture and its allied activities are the mainstay of the people of Mizoram. It would not be an exaggeration to say that there is literally no crop that cannot be grown in Mizoram.

Though there has been a remarkable increase of production in the horticulture sector, a very large quantity of the products are reported to get spoiled every year. This may be due to inadequate or improper harvesting, post-harvest handling, lack of processing facilities and the absence of linkage between the processors and the marketers of fruits and vegetables⁶.

Mizoram covers the geographical area of 21,081 Sq. km., out of which 11.56 lakh hectares (55%) is identified as potential area for horticulture crops. However, only 11.96 % of the total potential area is covered so far which proves that there is still a vast scope for further development of horticulture in the State⁷. It is, therefore, a very big challenge to utilise as many as the identified potential area for attaining self-sufficiency and achieving economic growth in Mizoram.

As per the reports on import and export of agriculture and allied commodities prepared by the Department of Trade and Commerce, Government of Mizoram, the total quantity of vegetables and fruits imported in 2017 was 181,410 Qtls and in 2018 it was 120,202 Qtls. Considering the amount of imported food items, self-sufficiency in food is still considered as the biggest challenge in Mizoram till today.

REVIEW OF LITERATURE

K L Chadha, A K Singh, S K Singh and W S Dhillon's (2013) book *Horticulture for Food and Environment Security* is a compilation of 56 lectures on diverse issues in horticulture given by scientists and experts from India and abroad.

S B Singh, NPrakash and S VNgachan (2011) in their book *New Perspectives on Marketing of Horticulture Crops in North East India* have highlighted that the production of horticultural crops has assumed great importance in the North-Eastern Hill region of India in view of the diversified topography, agro-climatic conditions and fertile soil resources.

E P Christopher's (2009) book *Introductory Horticulture* describes the various horticultural practices along with their scientific background. It deals with classification, structure and growth of plants: climatic requirement of horticultural crops: soil selection and management etc.

K V Peter's (2009) book *Basics of Horticulture* carries information on fundamentals of vegetables, fruits, ornamental plants, spices, medicinal and aromatic plants and post-harvest technology.

J Bimal Deb and B Ray Datta's (2006) edited book *Changing Agriculture Scenario in North East India* is the compilation of twenty six seminar papers. The book analyzes the impact of recent agricultural changes on population growth, migration and health of the rural people in the region.

D K Singh (2004) in his book *Hi-Tech Horticulture* deals with the basic concept of Hitech horticulture by mentioning that it is a chain system of cultivation having proper linkage right from selection of seed variety for sowing to supplying it to the end user.

SCOPE OF THE STUDY

Currently, various Central horticulture schemes have been implemented in Mizoram through the Department of Horticulture, Government of Mizoram. Mission for Integrated Development of Horticulture (MIDH), *Rashtriya Krishi Vikas Yojana (RKVY)*, *Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)* are some important Centrally Sponsored Schemes (CSS) implemented for the development of horticulture in the state. Under these schemes, thousands of horticulture farmers in the state have been assisted with the expenditure of huge amount of money. The progress in term of area coverage and productivity has also been noticeable.

OBJECTIVE OF THE STUDY: The following are the objectives of the research.

1. To study the institutional framework for horticulture development in Mizoram.
2. To explore the role played by the Government of Mizoram towards the development of horticulture.
3. To find out the effect of the horticulture schemes being implemented in Mizoram on the lives of the people.

⁵www.krishisewa.com/articles/miscellaneous/258-indian-horticulture-sector.html accessed on 21.12.2018

⁶ Meena, R.K., and Yadav, J.S., (2001), *Horticulture Marketing and Post Harvest Management*, Jaipur: Pointer Publishers, pp.2.

⁷ Department of Horticulture, *Important Achievements of Horticulture Department during 2019-2020*.(2020), pp.1.

4. To identify the problems in the path of horticulture development administration.
5. To explore and suggest remedial measures.

METHODOLOGY

Research Design

The present study is cross sectional in nature and descriptive in design. Mixed method was applied which involves an approach of enquiry that contains qualitative and quantitative techniques. The present study was undertaken with the help of both primary and secondary data. The primary data were collected through open-ended interview schedule and various other techniques such as field observation, in-depth interviews, reports, Acts and documentary examination to collect the relevant data for the study.

Sampling

Random purposive sampling method was adopted to collect primary data from horticulture farmers and government officials for the study area. Hence, for RKVY 28 farmers from Serchhip took part in the study. Unstructured and semi-structured interviews were also conducted with 17 officials of the concerned department. Along with the field interviews with the respondents, observation method, was also adopted to get information.

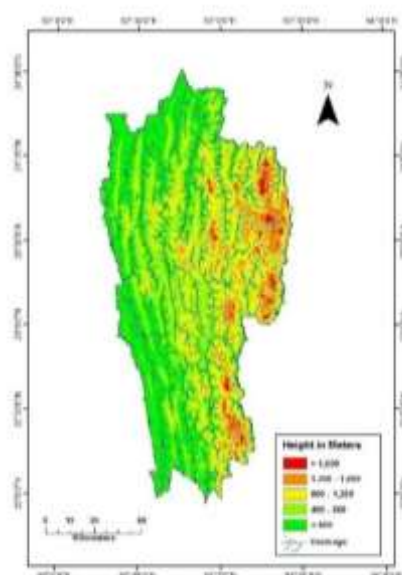
Sources of Data

For the present study, relevant data were collected from both primary and secondary sources. Primary data were collected through open ended semi structured interview schedule from 5 officials for RKVY and 28 beneficiaries and 5 government officials.

Secondary sources of data were collected from published documents of the Government of India and Mizoram viz., records of the Ministry of Agriculture and Farmers Welfare, Government of India, records of the Department of Horticulture, Government of Mizoram, records of the department of Agriculture, Government of Mizoram, reports of Economic Survey, Statistical Handbook of Mizoram. Further, it includes data collected from books, articles, journals, magazines, and concerned Government Websites etc.

Data Analysis

The collected data were processed and analyzed by using simple percentages and Descriptive Statistics.



Profile of Mizoram

Mizoram, as stated earlier, is a mountainous region situated in the north eastern corner of India. Geographically, it is situated between 92°15' E to 93°29' E longitude and 22°58'N to 24°35'N latitude⁸. The tropic of cancer runs through the state at the southern periphery of Aizawl city at 23°33' North latitude. The altitude ranges from 21 meters at Tlabung to 2,175 meters at Phawngpui. The area below the elevation of 500 meters above MSL (Mean Sea Level) is 10,56,269 hectares, between 500 to 1,000 meters is 7,09,136 hectares; from 1,000 to 1,300 meters is 1,96,350 hectares and above

⁸ Directorate of Economic and Statistic, Government of Mizoram, *Statistical Handbook* (2012), pp. XVII.

1,300 meters is 1,46,947 hectares on any slope of the land⁹. Hill ranges in Mizoram run from north to south. They are higher in the middle and smaller at both ends. The hills are rough and their heights irregular. The average height of the hills is 900 meters but the highest peak, the Blue Mountain also known as Phawngpuitlang by the Mizos reaches upto 2,165 meters high. It is in the southern part of Mizoram at Siaha District. As compared to the other hill states in the North East, hill slopes in Mizoram are steeper causing difficulties in cultivation of crops. Cutting through the narrow and deep gorges are swift rivers interspersed with rapid and sheer drops. Most of them eventually join the Barak river of Cachar District of Assam, though the Khawthlangtuipui meanders off into the Bangladesh plains and the Chhimtuipui (Kolodyne) into Myanmar¹⁰. The major rivers flowing towards the north are Tuivai, Tuivawl, Tuirial, Tlawng and Teirei. Rivers like Tupui, Tuichang and Mat are flowing towards the south. Tuichawng is the only river which flows toward the west. Amongst the rivers in Mizoram, Tlawng is the longest (185 km) and Chhimtuipui is the largest.

Climate/Rainfall : The climate of Mizoram is pleasant throughout the year. It is cool in the higher elevation and humid in the plains but still enjoyable. The climate of the entire state is directly influenced by monsoon. The state receives heavy rainfall between May and September. The average rainfall is 275 centimetres (2750 mm) every year. The north western portion of the state receives the highest rainfall- more than 350 centimetres (3500 mm) per year. The rainfall also increases southward with increase in humidity. In the capital Aizawl, rainfall is about 215 centimetres (2150 mm) and in Lunglei, another major centre, about 350 centimetres (3500 mm).

Year-Wise Monthly Rainfall in Mizoram (in mm) for 8 years

Sl. No	Month	Year							
		2020	2019	2018	2017	2016	2015	2014	2013
1	Jan	40.01	1.1	4.7	0.0	2.20	10.20	0.0	0.0
2	Feb	12.8	43.2	3.0	5.7	26.70	6.30	1.46	1.46
3	March	3.2	39.3	25.4	124.4	84.30	31.50	4.70	4.70
4	April	113.6	68.5	99.5	289.9	161.40	281.0	65.60	65.60
5	May	192.8	186.04	256.0	237.3	259.90	146.30	499.30	499.30
6	June	251	270.2	574.2	534.2	407.60	298.20	293.10	293.10
7	July	439.4	534.8	343.7	394.2	323.30	481.90	351.90	351.90
8	August	323.7	275.4	336.9	441.0	371.20	444.20	519.90	519.90
9	Sept	245	248.3	161.0	344.7	398.80	296.20	476	476
10	Oct	281.3	87.3	137.4	269.1	175.60	175.40	209.20	209
11	Nov	29.7	50.5	6.1	13.0	70.40	7.0	1.30	1.30
12	Dec	0	8.1	8.6	58.8	00	1.50	0.0	0.0
	Total	1943.8	1812.74	1958.5	2712.3	2213.7	2179.7	1821.20	2422.5

Source: Meteorological Data of Mizoram by Directorate of Economic and Statistic, Government of Mizoram

Based on variation and rainfall, there are three different types of seasons in Mizoram. These are:

- 1) The cold season or winter
- 2) The warm season or spring
- 3) The rainy season or summer

Soil : The soils of Mizoram are dominated mainly by loose sedimentary formation and are generally young, immature and sandy. They are developed from such parent rocks as sandstones, shales and siltstones. Derived soils with red, loamy texture are also found with high level of laterite. Acidity is high but low in potash and phosphorus. In uneroded soil, nitrogen content is comparatively higher which is still fostered by accumulation of organic matters. Soils in the river valleys are heavier as they are washed down by the rain from higher places. The surface soil of the hilly terrains is dark, highly leached and poor in bases, rich in iron and low in pH values ranging from 4.5-5.5 (highly acidity). Soils of the valley flat lands are dark brown, poor in bases, moderately acidic with pH ranging from 5.5-6.0, medium to high in organic carbon content, low available phosphate and medium to high potash.

HORTICULTURE: A CONCEPTUAL STUDY

The origin of horticulture can be traced back to the time when man began to cultivate gardens for growing vegetables and fruits. Before those men led a nomadic way of life. They kept on roaming around to hunt wild animals and collect plants and plant parts for their food. Soon after they consumed the food available in and around their place, they had to shift to

⁹ Ralte, Laltanpuui., (2005), *Agriculture Development Administration in Mizoram*, A Thesis submitted to Mizoram University for the Degree of Doctor of Philosophy, pp.3.

¹⁰ Ibid, p.3

another place where animals and plants were in abundance. Important landmark in the development of horticulture also occurred in Greek civilization. Greek civilization rose in 1800 BC and flourished during the Hellenic period (750-450 BC). It benefited horticulture as Greek writings on agriculture and horticulture notably spread in the Mediterranean region. They were also influenced by the earlier horticulture ideas and practices such as Persian garden model.

Importance of Horticulture

Global production of horticultural crops is in million tonnes. They provide us many essential components of our everyday meal. Horticulture generates employment- a profession for researchers and teachers and an occupation for gardeners or farmers. It has now become one of the most important components of trade at local, national and international level. It is a source of physical exercise and means to generate even a small income for individual amateurs. It also provides individual's aesthetic needs by providing garden full of beautiful flowers and other beautiful horticultural crops. Mental wellness and economic prosperity of individuals and nations are also greatly determined by horticulture.

Rashtriya Krishi Vikas Yojana (RKVY)

Rashtriya Krishi Vikas Yojana (RKVY) is another important scheme implemented for the development of horticulture in Mizoram. Horticulture has been one of the components of the scheme; its contribution towards the expansion of area coverage under horticulture has been recognized. The amount of funds allocated and utilized has contributed towards several positive changes on many horticulture activities in the state. Since the inception of the scheme, more than 6 thousand lakhs have been spent to cover more than 10 thousand hectares of land and for undertaking other activities such as construction of community and individual water tanks, setting up of greenhouses, construction of roadside markets, etc.

Gender Distribution

Gender of the Respondents under RKVY

In Serchhip district, there are 28 respondents. All of them are male. The male respondents constituted 100 percent whereas no female respondents are found in the area. Out of the total number of 28 respondents, 12 respondents (42.85percent) respondents are under fruit crops and vegetable. As can be seen in the below table no female respondents undertaking fruit and vegetable cultivation in the districts. Out of 28 respondents, 4 respondents, constituting 14.28% are under the infrastructure category and no female respondents are found in the district.

Sl.No	Trade	Serchhip		%
		Male	Female	
1	Fruit	12		42.85
2	Vegetable	12		42.85
3	Spice			
4	Infrastructure	4		14.3
5	Total	28		100

Educational Qualification

The below table shows the educational level acquired by the respondents in the districts. Among the total number of 28 respondents, there is no respondent who is illiterate, HSSLC (Higher Secondary School Leaving School) or any Post Graduate degree holders. Respondents who have passed Middle School standard are highest in number contributing 57.14 percent of the total number of respondents. They are followed by respondents Constituting 14.28 percent from Primary School, HSLC (High School Leaving Certificate) and Graduation.

Sl.No	Educational Level	Serchhip	%
1	Illiterate		
2	Primary School	4	14.28
3	Middle School	16	
4	HSLC	4	
5	HSSLC		
6	Graduate	4	
7	Post Graduate		
8	Total	28	

Marital Status

The marital status of the respondents in the districts is shown in the below Table. Of the total respondents, 24 respondents which constitute 85.71 percent are married and living with their family while 4 respondents i.e., 14.28 percent of the total respondents are single.

Name Of District	Male	Female
Serchhip	24	4

Age Groups

Table below depicts the age group of respondents in the districts. Respondents belonging to the age group of 41-50 are highest in number forming 42.85 percent of the total respondents while there are no respondents in the age group of below 18 years, 18-30 and 31-40. Respondents in the age group of 61-70 stood second in terms of the number of respondents which constitute 28.57 percent. The age group of 51-60 and 71 – 80 has only 4 respondents whose percent stands at 14.28 percent.

Sl.No	Age Group Category	No of respondents
1	Below 18	
2	18-30	
3	31-40	
4	41-50	12
5	51-60	4
6	61-71	8
7	71 Above	4

Trades Undertaken

The number of respondents based on the activity carried out under the scheme is shown in the table below. Respondents who are dealing with fruits and vegetable within the areas under study are highest in number with 42.85 percent each. They are followed by respondents under Infrastructure who constituted 14.28 percent

Sl.No	Trade	No of Respondents	Percentage
1	Fruit	12	42.85
2	Vegetable	12	42.85
3	Spice		
4	Infrastructure	4	14.28

Land Holding

The table below shows the land holding status of respondents in terms of area. Respondents having 2-3 hectares of land contributed the highest number among the respondents with 46.42 percent while respondents having 1-3 and 4-5 hectares of land contributed the least number constituting 14.28 percent only. Respondents having 3-4 hectares of land stood second in terms of area of land owned with 25 percent.

Table shwoing Land Holding Status (Area) under RKVY

District	Crop/Trade	Below 1 Hectare	1-2 Hectare	2-3 Hectare	3-4 Hectare	4-5 Hectare	5-6 Hectare	6 or more Hectare
Serchhip	Fruit			4	4	4		
	Veg		4	8				
	Spice							
	Infra			1	3			
Total			4	13	7	4		
Percentage			14.28	46.42	25	14.28		

Land Ownership

Table showing Land Ownership Status of the Respondents under RKVY

Sl.No	District	Crop/Trade	Owned	Rented
1	Serchhip	Fruit	12	

		Veg	8	4
		Spice		
		Infrastructure	4	
5	Total		24	4
6	Percentage		85.71	14.28

The above table depicts the land ownership status of the respondents. Out of the total of 28 respondents 24 (85.71 percent) possesses the land on which they are undertaking the scheme while 4 (14.28 percent) respondents are working on land owned by others. It may be highlighted here that respondent's dependent on land owned by others do so free of cost. Such lands are mostly owned by other beneficiaries who possess larger area of land as they are more convenient to establish clustering.

Among the respondents who had undertaken their horticultural activity on their own land under the scheme, the maximum number are those involved in fruit component at 42.85 percent, vegetable contributed 28.57 percent while infrastructure constituted 14.28 percent.

Assistance to Beneficiaries

Table below reflects whether respondents received assistance in cash or kind. 22(77.44 percent) respondents received assistance in cash only while 66 (53.22 percent) received assistance in kind only. 36(29.03 percent) received assistance both in cash and kind. Regarding the number of respondents receiving assistance in cash only, respondents with infrastructure constituted 45.45 percent being the highest followed by spice constituting 36.36 percent respondents and vegetables with 18.18 percent of the total respondents. No respondent belonging to fruit component received assistance in cash only.

In respect of the number of respondents who received assistance in kind only, fruits comprise 48.48 percent of the respondents, vegetables 36.36 percent, infrastructure 9.09 percent and spice 6.06 percent. Out of the 36 respondents who received assistance both in cash and in kind, spice constituted 66.67 percent while infrastructure, fruits and vegetables contributed 11.11 percent each.

Table showing Form of Assistance Received (Cash or Kind) under RKVY

Sl.No	District	Crop/Trade	In Cash	In Kind	Both
1	Serchhip	Fruit		8	4
		Vegetable		12	
		Spice			
		Infrastructure	2	2	
2	Total		2	22	4
3	Percentage		7.14	78.57	14.28

The Table below relates the number of installments received by respondents. 36 respondents which accounts for 29.03 percent received assistance only once while those who received assistance twice or thrice or more are similar in number comprising 35.48 percent each.

Table showing no. of Installments of Assistance Received under RKVY

Sl.No	District	Crop/Trade	1 Instalment	2 instalments	3 or more instalments
1	Serchhip	Fruit	8	4	
		Vegetable	4		8
		Spice			
		Infrastructure	4		
2	Total		16	4	8
3	Percentage		57.14	14.28	28.57

In Serchhip district, 16 respondents which constituted 57.14 percent received assistance only once, 14.29 percent twice and 28.57 percent thrice or more.

Among the fruit respondents, 28.57 percent respondents received one instalment, 14.28 percent received two instalments. About the number of respondents with vegetables, those who received assistance only once constituted 14.28 percent each while 28.57 percent received assistance three or more than three times. In respect of the respondents with infrastructure, 14.28 percent received assistance once.

Timely Receipt of Assistance

The table below reveals whether respondents received assistance on time. 85.71 percent could receive assistance on time without any delay whereas 14.28 percent witness delay in receiving assistance. In Serchhip have 4 respondents each who could not receive assistance on time. All respondents under the component of fruits received assistance on time. With regards to the number of the respondents with vegetables, 8 (28.57 percent) received assistance on time while 14.28 percent failed to receive on time. In respect of the respondents with infrastructure, all respondents could get assistance on time.

Table showing Timely Receipt of Assistance under RKVY

Sl.No	District	Crop/Trade	Yes	No
21	Serchhip	Fruit	12	
		Vegetable	8	4
		Spice		
		Infrastructure	4	
2	Total		24	4
3	Percentage		85.71	14.28

Membership in Farmer's Interest Group (FIG)

Table shows respondents' membership in any association or society related to their horticulture activities. 100 percent are registered in one or more associations related to their horticulture activities.

Table showing Membership in FIG

Sl No	District	Crop/Trade	Yes	No
1	Serchhip	Fruit	12	
		Vegetable	12	
		Spice		
		Infrastructure	4	
2	Total		28	
3	Percentage		100	

In relation to the components among the respondents with fruit and vegetables, 42.85 percent are members of their activity related association/society. Regarding spice respondents, 100 percent of the respondents are not with related association being the only component with all respondents having no membership. Among the respondents with infrastructure, 14.28 percent are members of associations related to their horticulture activity.

Participation in Training under the scheme

Table below highlights whether the respondent's attended training/s organised for their activity under the scheme. 57.14 percent attended one or more trainings whereas 42.85 percent did not attend any.

Table showing Whether attended Training (s)?

Sl.No	District	Crop/Trade	Yes	No
1	Serchhip	Fruit	4	8
		Vegetable	8	4
		Spice		
		Infrastructure	4	
2	Total		16	12
3	Percentage		57.14	42.85

Among the fruit respondents, 14.28 percent attended training and 28.57 percent have not. Regarding vegetables, the numbers of respondents who have attended training are of 28.57 percent while 14.28 percent have not attended any. With respect to respondents with spice, no respondents undergo training session and not participate in any training. Among the respondents with infrastructure, all of them have attended one or more training organised for their activities, constituting 14.29 percent.

Table showing Is/Are Training (s) Helpful?

Sl.No	District	Crop/Trade	Yes	No
1	Serchhip	Fruit	4	
		Vegetable	4	4
		Spice		
		Infrastructure	4	
2	Total		12	4
3	Percentage		42.85	14.28

As shown in above Table 42.85 percent have found the training(s) attended by them helpful in the course of their work whereas 14.28 percent felt that their training were not that helpful in relation to their performance in the chosen component of the scheme. Several of them cited that several of the skills and processes imparted during training were difficult to practice on farm.

Extension Services

Table below shows whether respondents under the scheme had received any extension guidance from the implementing agency. In Serchhip district respondents comprising 85.71 percent were given technical or extension guidance at least once while 14.28 did not received any.

Of the respondents with fruit, 28.57 percent were given guidance from the Department more than once while 14.28 percent did not receive any guidance or supervision. In respect of the number of respondents with vegetables, 42.85 percent received guidance from the Department. 4 respondents under infrastructure were given extension guidance from the concerned Department through technical staff.

Table showing Whether received technical/extension Guidance?

Sl.No	District	Crop/Trade	Yes	No
1	Serchhip	Fruit	8	4
		Vegetable	12	
		Spice		
		Infrastructure	4	
2	Total		24	4
3	Percentage		85.71	14.28

The under table enumerates the number of respondents who received inspection and monitoring from the Department to make sure that assistances rendered were utilized as stipulated in the scheme. 85.71 were inspected and monitored by the Department whereas 14.28 percent were not.

Table showing Inspection and Monitoring under RKVY

Sl.No	District	Crop/Trade	Yes	No
1	Serchhip	Fruit	8	4
		Vegetable	12	
		Spice		
		Infrastructure	4	
2	Total		24	4
3	Percentage		85.71	14.28

Regarding the number of inspected respondents, 66.66 percent respondents of fruit, 100 percent respondents of vegetables, 100 percent of infrastructure component were inspected by the Department at least once or more.

Problems and Issues of Respondents

Table below depicts the number of respondents who have problems and those who have no problems or issues during their activities under the scheme. 71.42 percent are facing some problems while 28.57 percent respondents carried out their activities without facing any big obstacle.

Table showing No of Respondents with and without problems and issues in the course of work

Sl.No	District	Crop/Trade	No of Respondents with Problems	No of Respondents without Problems
1	Serchhip	Fruit	8	4
		Vegetable	8	4
		Spice		
		Infrastructure	4	
2	G. Total		20	8
3	Percentage		71.42	28.57

In Serchhip respondents facing difficulties in their course of work are 71.43 percent respectively. Respondents who have not faced any issue in Serchhip are 28.57 percent. In Serchhip district as well, pests have been the biggest problem faced by most of the respondents who constituted 42.85 percent. They are followed by respondents facing problems such as plant diseases, theft and encroachment by wild animals constituting 14.28 percent each.

Table showing Nature of the Problems and Issues (District wise)

Sl.No	Problem/Issue	No of Respondent
1	Scarcity of water	
2	Poor quality of Soil	
3	Plant Disease	4
4	Poor Quality of Planting Materials	
5	Scarcity of fertilizers	
6	Storms/Flood/ other calamities	
7	Insufficient Assistance	
8	Pest	12
9	Theft	4
10	Inappropriate Location of Farm	
11	Wild Animals	4

Labour Utilisation

In Serchhip district also, 17.86 percent of the respondents rely on additional labour on regular basis while the percentage of respondents with occasional additional labour is 82.1

Table showing Utilization of Labour

Sl.No	District	Trade	Farmers with additional Labour (Regular)	Farmers with additional labour (Occasional)	Farmers without additional labour
1	Serchhip	Fruit	4	8	
		Veg		12	
		Spice			
		Infra	1	3	
2		Total	5	23	
3	Percentage		17.85	82.14	

Table show below reveals the trade-wise average monetary profits of respondents under RKVY. Among the respondents those who have not made any profit are 19.35 percent of which 83.33 percent are respondents with fruit, 16.67 percent with spice. There are 4 respondents from infrastructure alone which constitute 3.23 percent of the total number of respondents who could make profit below Rs 10,000 per annum. Respondents who could make profit between Rs 10,000 - 29,000 are from both fruits and vegetables constituting 3.22 percent each.

Among the 12.90 percent respondents with profit of Rs 30,000-49,000, vegetables and infrastructure constituted 25 percent each, spice with 50 percent. Out of the 38.70 percent of respondents with a profit of Rs.50,000 - 99,000, 16.67 percent are from fruits, 25 percent each are from vegetables and infrastructure, 33.33 percent are from spice.

9.67 percent of total respondents could make a profit of 1-1.9 lakh. Among these respondents, 33.33 percent each are respondents with fruits, vegetables and spice. A minute percentage of 6.46 of the total respondents could make a profit of 2 - 2.9 lakhs. This profit could be made only by respondents under fruits. With regard to the number of respondents who can make 3-3.9 lakhs profit, there are 3 respondents from infrastructure component constituting 3.22 percent of the total respondents.

Table showing Yearly Average Monetary Profit of Respondents (Crop Wise) under RKVY

Sl.No	Profit	No of Respondents				Total	Percentage
		Fruit	Vegetable	Spice	Infrastructure		
1	No Profit	20		4		24	19.35
2	Below 10000			4		4	3.23
3	10000-29000	4	4			8	6.45
4	30000-49000		4	8	4	16	12.90
5	50000-99000	8	12	16	12	48	38.70
6	1 Lakh-1.9 lakh	4	4	4		12	9.67
7	2 lakh-2.9 lakh		8			8	6.45
8	3 lakh-3.9 lakh				4	4	3.23
9	4 Lakh-4.9 Lakh						
10	5 lakh- 5.9 lakh						

Table below highlights the average district-wise monetary profits of the respondents under RKVY. All respondents from Serchhip district could make a certain level of profit.

Those with a profit in the range of Rs. 10,000 – 29,000 in a year all hail from Serchhip districts totalling to 14.28 percent of the respondents.

Table showing Yearly Average Monetary Profit of Respondents (District Wise)

Sl.No	Profit	Serchhip	Total	Percentage
1	No Profit			
2	Below 10000			
3	10000-29000	4	4	14.28
4	30000-49000			
5	50000-99000	12	12	42.85
6	1 Lakh-1.9 lakh	4	4	14.28
7	2 lakh-2.9 lakh	8	8	28.57
8	3 lakh-3.9 lakh			
9	4 Lakh-4.9 Lakh			
10	5 lakh- 5.9 lakh			

The different mechanisms for selling off the produces by the respondents are reflected in Table below. Respondents who sold their produces to the intermediaries are highest in number with 46.42 percent followed by 35.71 percent who could sell their produces in the market directly. 17.85 percent sold both directly and through intermediaries.

Table showing Marketing of the Produces

Sl.No	Mode of selling	No of respondent	Percentage
1	Sold directly	10	35.71
2	Sold to Intermediaries	13	46.42
3	Both Sl No 1 and 2	5	17.85
4	Through Dept Arrangement		
5	Both Sl no 2 and 4		
6	Not Sold		
	Total	28	100

Table showing Problems/ Issues in selling off the produces

Sl.No	District	Crop/Trade	Respondents with no problem	Respondents with problem
1	Serchhip	Fruit	12	
		Vegetable	4	8
		Spice		
		Infrastructure	4	
2	Total		20	8
3	Percentage		71.42	28.57

The above table represents the number of respondents with problems and those having no problem in marketing their produces. 71.42 percent of respondents could sell their produces without any obstacle whereas 28.57 percent are facing some problem in marketing their produces.

Table showing Whether Post Harvest Management is utilised

Sl No	District	Crop/Trade	No. of Respondents with PHM	No. of Respondents with no PHM
1	Serchhip	Fruit		12
		Vegetable		12
		Spice		
		Infrastructure		4
2	Total			28
3	Percentage			100

The above table represents the number of respondents who have or have not utilized Post Harvest Management activities. Post Harvest Management activities such as preservation in Cold Storage Facilities, Value Addition etc., 100 percent have not incorporated post-harvest management processes.

Future of the Respondents

Table showing reflects the plans of the respondents in relation to the continuance of their trades. Respondents who think that they can continue their horticulture activities only with assistance from the government or any other source are highest in number constituting 78.57 percent of the total number of respondents. 14.28 percent already gave up their activity and are giving up on their crop and plan to undertake a new crop.

Regarding the number of respondents who are planning to grow and expand their activities without further assistance, respondents in Serchhip district has only 7.69 percent. The number of respondents who can continue their activities only with further assistance in Serchhip are 35.48 percent.

Table showing Post-Scheme Plans of the Respondents

Dist	Crop/Trade	Respondents who can grow/expand without additional assistance	Respondents who can continue only with further assistance	Plan to change crop	Respondent who already gave up their trade
Serchhip	Fruit		8		4
	Vegetable		12		
	Spice				
	Infrastructure	2	2		
Total		2	22		4
Percentage		7.14	78.57		14.28

Additional Aid and Income Source

Table showing Serchhip district has the highest percentage of respondents having other supplementary source of income at 100 percent.

Table showing Additional Source of Income

Sl.No	District	Crop/Trade	Respondents with other Regular source of income	Respondent without other Regular source of income
1	Serchhip	Fruit	12	
		Vegetable	12	
		Spice		
		Infrastructure	4	
2	Total		28	
3	Percentage		100	

Additional Back Up for Respondents

Serchhip district has 57.14 percent of respondents who received additional back up and 42.86 percent who have not.

Table showing Farmers with additional back up from the Dept

Sl.No	District	Crop/Trade	Respondents with additional back up	Respondents without additional back up
1	Serchhip	Fruit	4	8
		Vegetable	8	4
		Spice		
		Infrastructure	4	
2	Total		16	12
3	Percentage		57.14	42.85

In respect of the number of respondents based on different crops/trade who received additional back up, vegetables contributed the highest number of respondents with 28.57 percent while other crops/trade such as fruit and infrastructure contributed 14.28 percent each. Regarding respondents who are without additional back up, fruits contributed highest number which constituted 28.57 percent while, vegetables have 12.28 percent. The respondents among spice and infrastructure runs without an additional back up.

Problems faced during the Study

During the conduct of the study, the researcher has faced some problems which hampered the smooth flow of the research. Some are caused by unavoidable circumstances. There were certain problems faced which, however, could be solved to keep the research going. Few of the problems encountered by the researcher are stated below:

1. Pandemic: COVID-19 lockdowns and the risk of infection stopped fieldwork for nearly two years. A researcher contracting the virus also caused a significant loss of time.
2. Difficulty in Procuring Data: Department officials, especially at Headquarters, were reluctant to share information. Each data request needed the Head of Department's approval, often leading to delays of two months or more.
3. Lack of Documentation: The relevant department and some beneficiaries often did not have proper records, making the study difficult. This was a major obstacle since government records are a key source for this kind of social science research.
4. Attitude of respondents: A small number of respondents interviewed by the researcher seemed suspicious and hesitant to answer questions until they received an explanation of the study's purpose. However, by the end of the interview, they became very helpful in finding answers to the research questions. Meanwhile, some respondents requested additional assistance from the researcher because they could not tell the difference between research and the government officials managing the scheme that provided them support. Although the researcher could not meet their needs, this greatly motivated them to put in more effort for the research.

Limitations of the Study

It is thought that further research on these schemes would be very helpful to understand the status of Horticulture in Mizoram.

Suggestion

As mentioned above, the implementing agency as well as the stakeholders of the scheme has encountered many obstacles in the process of the implementation of the scheme. Though several beneficiaries are still able to achieve

desirable progress, many are adversely affected and further compelled to give up their activities. The following are some possible measures which can be taken both by the government and the beneficiaries.

1. **Timely Release of Fund:** To ensure the efficient implementation of the schemes, fund allocated should be released on time at any level whether it is central, state or district. The beneficiaries should be able to take all necessary steps to commence their activities on time as most horticultural activities depend on the season, climate etc., one delay can adversely affect the whole year's activities.
2. **Appointment of more staff:** More staff (technical or non-technical) need to be recruited and appointed by the Government of Mizoram. Even if the creation of new posts is difficult, the vacant posts due to the death and superannuation of the personnel should be filled as early as possible to ensure the availability of the required manpower and skill for successful implementation of schemes.
3. **Awareness among the politician:** Politicians (at all levels) especially those in power should be aware of the importance of the schemes and the possible damages that can be caused due to the selection of those who do not deserve assistance. Exertion of undue pressure by the people for preferential treatment also needs to be done away with.
4. **Thorough study on the suitability of land:** Careful analysis on the suitability of land is a must before undertaking any horticultural activities. Though the topography of the state might not be comparatively conducive for the cultivation of all horticulture crops, but understanding the kind of crops for a particular type of soil can greatly enhance the working of horticulture. It has been discovered during the current study that cultivation of certain variety of crops successfully cultivated in other parts of the world has not had the expected outcome in terms of quality.
5. **Exploration and subsidization of suitable machineries:** Thorough study on the available small machineries suitable for use in the rugged topography of Mizoram would help in reducing the onus of farmers as well as in expediting their works. Further, provisions for subsidization for the farmers may be explored to enable them to have access to such machineries.
6. **Provision of connectivity:** The sites selected for carrying out horticulture activities should be easily approachable for easy transportation of planting materials and farm materials as well as the farm produces. The selected sites for implementation of schemes if not already armed with connectivity and linkages should be in areas where construction of link road will require less expenditure and where better-quality connectivity is possible.
7. **Supply of quality planting material:** Productivity and production of horticulture crops largely depend on the quality of planting materials supplied. Good quality planting materials means more productivity and production. In the same way, cultivation of poor-quality planting materials can adversely affect the quality and quantity of the produces which may further lead to the total failure. The concerned department should take all necessary steps to ensure that only quality planting materials are disbursed to the beneficiaries.
8. **Selection of deserving farmers for assistance:** The implementing agency should take all possible measures to ensure that only the deserving farmers get assistance. Pressure from political leaders or any individuals should not be taken into consideration. Therefore, it is imperative that the personnel who oversee the schemes should carry out their duties and responsibilities without fear or favour.
9. **Sufficient Assistance:** To make farmers successful in the activities undertaken under the schemes, assistance given to them should be sufficient to meet at least their basic needs. Emphasis should be given on the sufficiency of funds and availability of farm materials such as fertilizers, pesticides etc., for each farmer rather than the number of farmers to be assisted.
10. **Stable Market:** Stable market where the farmers can sell off their produces at reasonable and regular prices are necessary for successful working of agriculture and its allied sectors including horticulture. To avoid market problem which have been faced by many farmers across the state, channels for exporting the producers of the farmers needs to be explored. Government can make meaningful effort for this task.
11. **Utilization of Post Harvest Management Facilities/Activities:** More accessible cold storage facilities should be set up by the government to preserve the producers of the farmers. This is necessary for making the horticulture crop available in the market during the off season at profitable prices for farmers.
12. **Setting up of horticulture-based industries:** More agro/horticulture-based industries in the state should be set up to take up the activities of *value addition*. The provision for regulating such industries should be simplified and more user friendly so that more industry will come up where farmers can sell their produces at lucrative prices. The Government can make huge contribution in this regard.
13. **More irrigation facilities:** Rivers and streams in our state can solve water problems of farmers to a great extent if there are more irrigation facilities. Regarding irrigation, government intervention is a must to have a better system.

Conclusion

Regarding the implementation of RKVY in Mizoram, much effort has been put by both Government of India and the State Government in terms of fund allocation, dissemination of expertise through training, technical guidance, market arrangement etc. However, desirable results have not been achieved so far due to several problems such as cultivation of

poor-quality planting materials, shortage of technical and non-technical staff to look after the schemes, selection of undeserving beneficiaries, absence of stable market etc.

Horticulture is getting more recognition and appreciation due to the contributions of its produces towards the well-being of the people in respect of nutrition for better health and income generation. Its ability to achieve sustainability of small land holdings, employment generation, environment protection, more export potential etc., has added its significance. However, the importance of horticulture is said to be recognized since the 1980s only after the leaders of the country and the experts realized the said ability of horticulture for achieving the goals of the nation in some respects. As of today, horticulture has become one of the most important sectors which the Government of India has undertaken with the investment of more than 2000 crores.

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