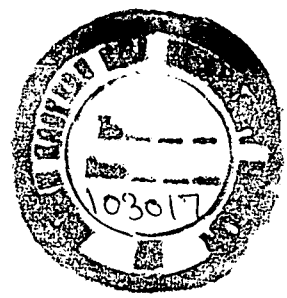
STUDIES ON HORTICULTURE PROSPECTS IN MIZORAM



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This is to certify that the term papers entitled "Studies on Horticulture Prospects in Mizoram" has been written by Lalrinchhana under my supervision as a partial fulfillment of the Master Degree of Arts in Economics.

Dated Aizawl,
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LALRINCHHANA.

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CHAPTER I

INTRODUCTION.

This write up is an attempt to present a broad picture of horticulture in Mizoram.Shifting cultivation or Jhumming a primitive mode of cultivation is widely practised in Mizoram on varying degrees of hill slopes.The evil effects of this mode of cultivation are well known in terms of soil degradation,soil erosion,floods in the plain and so on.The increasing pressure of population and the weakening opportunities of seeking employment in the government sector has forced the people to remain engaged in agriculture or to remain unemployed.The mounting pressure on land for agriculture has resulted in shortening of the jhum cycle from 20 years to 5 years or 3 years in many case which do not allow the land surface recoup the fertility of the top soil resulting in low productivity.The Indian Council of Agriculture Research (ICAR) complex at Shillong has suggested three tier structures to solve the problems so that depletion of forest can be checked and people will get sufficient income to earn their livelihood in a respective manner of horticulture in the middle belt and agriculture in the foothill areas.

The importance of horticulture lies in suitability of climate,rainfall and temperature.The biggest problem in promoting horticulture in the hills is absence of enthusiasm amongst the villagers due to absence of marketing

and scientific knowledge to promote horticulture and so on.Whatever horticulture crops are grown locally,the growers find difficulty in getting renumerative price for their produce.This hampers their interest and ultimately go for taking out land from the forest for agricultural purpose.To solve the problem promotion of horticulture is the best solution to solve many problems such as, stopping depletion of valuable forest resources,soil degradation and erosion,maintaining balance in eco-system and also rising income @pportunities to horticulturists from horticulture crops and industries based on these crops.

Since there are many problems related with horticulture development we find appropriate to take up a case study of horticulture,its present status and the problems related with the development to come out with some concrete suggestions which may be helpful in removing many of the bottlenecks in horticulture promotion and growing income to the villagers.With this idea the study was taken up which is based mainly of official,semi-official, reports,documents and records,reports of various commissions and committees,seminar papers,reports of surveys undertaken by various authorised bodies,books and booklets, journals etc.Also informations and suggestions from some resource persons as well as government officers served as useful source materials.Due to scarcity of reliable data

the paper may not be up to the expectation.However the writer hope that the analysis that has been attempted in this write up would give an idea to the readers about the prospects of horticulture in Mizoram.

GENERAL BACKGROUND.

Mizoram with its geographical area of 21,081 sq.km.is predominantly a hilly state with varying altitudes ranging from 40m. upto a minimum elevation of 2,360m.It falls under Sub-Region(iii) of Eastern Himalayan Zone according to demarcation of 15 Agro-Climatic Region in the country.It enjoys tropical and sub-tropical climate where most of the horticultural crops flourish.Mizoram is best endowed with rich resources of soil and agro-climatic conditions making it one of the fertile regions of the country.This reflects the suitability of horticulture in Mizoram.

LOCATION.

Mizoram located at 20.20 degree East Longitude and 92.20 degree North Latitude.It covers an area of 21, 081 sq.km. and is administratively divided into three districts.It has 122 kms border with Assam,66 kms with Tripura,95 kms with Manipur,404 kms with Burma and 306 kms with Bangladesh.It is a hilly state with fairly steep slopes.

306
404
710kms

CLIMATE.

The climate is characterised by its coldness, high relative humidities nearly all the year around and abundant rainfall.The year may be divided into four seasons.The cold season from December to February is followed by the summer season from March to the last week of May.The South West Monsoon which follows thereafter continued till the last week of October.The rest of October and November constitute the autumn season.The valleys are unhealthy during the rains,the climate,even in the lower hills is moist and enervating.In the higher ridges it is fairly cool and pleasant even at the hottest season of the year.

RAINFALL.

On account of the hilly nature of the terrain, the rainfall varies very much from place to place.The South-West Monsoon sets in by about the eng of May and lasts till about the end of October.The rainfall during the period from June to September constitutes about 60 percent of the annual rainfall.About 20 percent of the annual rainfall occurs during the pre-monsoon months and is mostly in the form of thunder-showers.

TEMPERATURE.

Temperature ranges from 20 degree C to 30 degree C in summer and 8 degree C to 18 degree C in winter.

January is the coldest month with the mean daily maximum temperature at 20.2 degree C and the mean daily minimum of 11.4 degree C at Aizawl.From March the temperature begins to rise rapidly.April and May are the warmest months with the mean daily maximum at about 26.3 degree C and the mean daily minimum at 17.5 degree C at Aizawl. With the withdrawal of the monsoon early in October both day and night temperature decreases.

The highest maximum temperature recorded at Aizawl was 33.3 degree C in 1938,April 17th and the lowest minimum was 3.9 degree C in 1945,January 8th and 13th February,1950.Average temperature in winter -11.8 degree C to 21.30 degree C,in summer-20.80 degree C to 29.8 degree C.

HUMIDITY.

The air is highly humid nearly all the year around.Relative humidities are highest during the South-West Monsoon when they are above 90 percent.The period from February to April is comparatively drier when the relative humidities are between 60 and 70 percent.

POPULATION.

The population according to 1991 census is 686,217.It has the highest literacy rate of 82.77 % in the North East and second highest in India.About 317,040 of the population lives in urban area and the rural population is about 3,69,177.The percentage ratio of

urban population to rural population is 46.20:53.80 and the density of population is about 33 per sq.km.The Mizo people are basically cultivators and about 70 % of the people are engaged in agricultural activities.

The state has a very high percentage (95.38) of scheduled tribe population,the highest in North East.Similar position is held by Mizoram in respect of urban population.The following table indicates the percentage of main workers as distributed in different occupation group.

Table 1.1 PERCENTAGE OF MAIN WORKERS DISTRIBUTED IN DIFFERENT OCCUPATIONS.

Occupations		1971	1981	1991
1.Cultivator	Males	74.18	61.38	52.59
	Females	96.43	86.31	73.82
2.Agriculture	Males	0.44	2.67	3.96
labour	Females	0.27	2.16	3.38
3.Household	Males	0.27	1.64	1.25
industry	Females	0.05	0.73	1.24
4.Others	Males	23.11	34.31	42.21
	Females	3.54	10.81	21.55

Source:Agro-Horticulture Survey.

CHAPTER - II

LAND UTILISATION.

The nature of land use in an area reflects the level of Socio-Cultural and economic development of the people.The development of agriculture depends on land resource utilisation both quantitatively and qualitatively.In Mizoram,agriculture claims the largest share of land use virtually all types of production is attributable to agricultural activity.

Land use statistics are not properly maintained.Out of the total geographical area of 21,08,000 ha. forests constitutes 61.99 % and net sown area 3.09 %. Total operational holdings were 5200 ha. in 1985-88.Out of these marginal holdings constituted 40 %,small 36 %, semi-medium 2 % and large only negligible.

A large proportion of the land is not uninhabited but impossible to cultivate or inhabit,and only clearing in this jungle exists where human hands have made them in order to secure a village site,or a place on the rough slopes to sow the crops.Basic statistics of North Eastern Region 1990 and 1992 and Directorate of Economics & Statistics,Ministry of Agriculture,Government of India qoute distribution of total land area of Mizoram among various categories based on figures of 1974-75.The figures as available are reproduced in table 2.2.1.

Table 2.1 AREA UNDER VARIOUS LAND UTILISATION CATEGORIES IN MIZORAM.

Land use classification	Area(000'ha)	Percentage.
1.Forest	1303	61.99
2.Not available for cultivation	211	10.04
3.Other uncultivated land excluding fallow.		
a)Cultivable waste	74	3.52
b)Others	7	0.33
4.Fallow land.		
a)Current fallow	183	8.71
b)Old fallow	259	12.32
5.Net sown area	65	3.09
6.Total reporting area for land utilisation statistics	2102	100.00
7.Total geographical area	2108	

(21,08 see p.3)

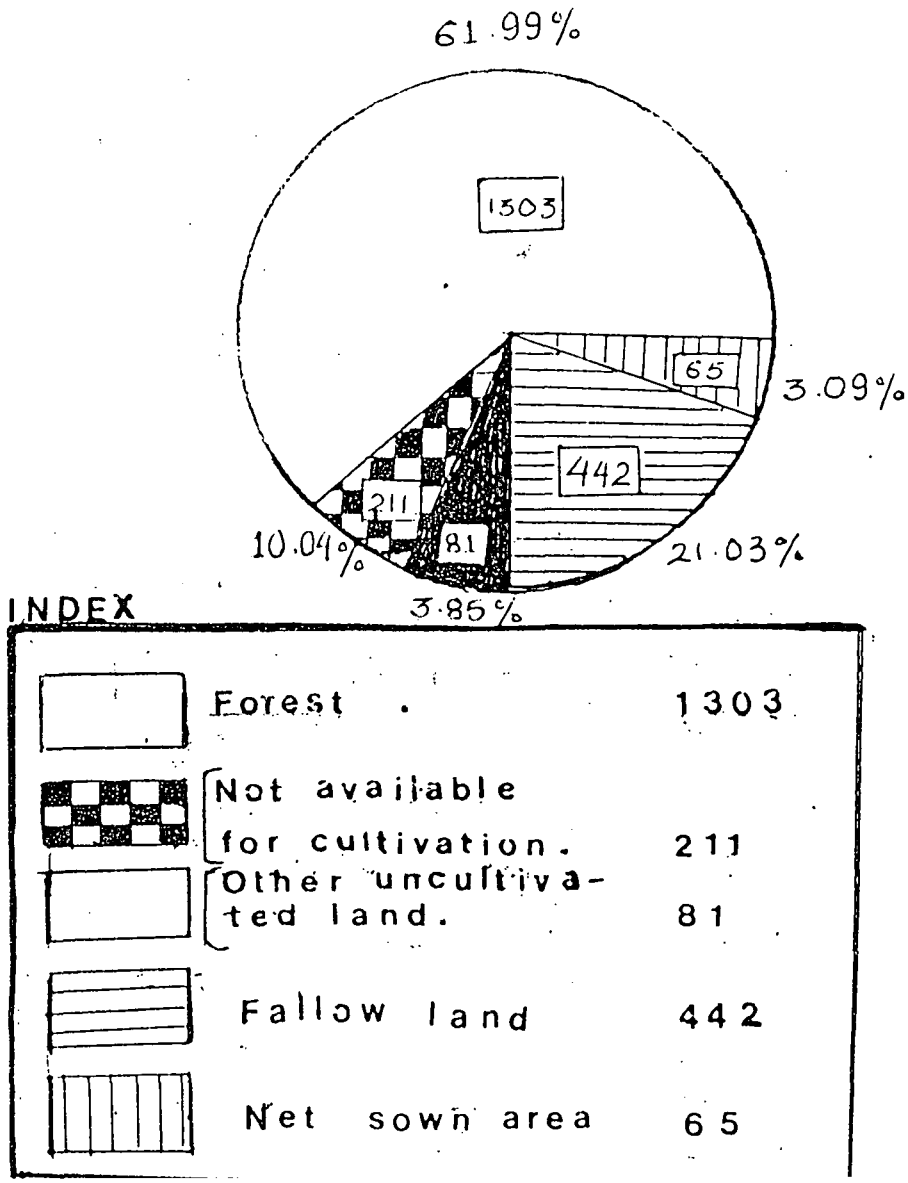
Source:Agro-Horticulture Survey.

As evident from table 2.1 more than about 70 % of the cultivable area remained unutilised or underutilised for cultivation which indicate a very wasteful pattern of allocation of land resources.Thus it is the great necessity to take up measure for preventing the relatively abundant supply of land from the wild destruction of shifting cultivation.

CHART NO 2.1

LAND UTILISATION IN MIZORAM

AREA (000 ha)



OPERATIONAL HOLDINGS.

The last agricultural census of operational holding in 1985-86 had shown that there were in all about 52 thousand operational holdings covering an area of 82 hectares.The number of such operational holdings in 1980-81 was around 43 thousand which covered an area of 69 thousand hectares.The number and area as distributed in five class group of holdings during the two census was under.

Table 2.2 NUMBER AND AREA OF OPERATIONAL HOLDINGS IN DIFFERENT SIZE GROUPS.

Size/Group	1980-81 Census		1985-86 Census	
	No.(000)	Area(000ha)	NO(000)	Area(000ha)
Marginal (upto 1.0ha)	16(33.5)	11(15.5)	21(40.4)	15(18.5)
Small (1.0 to 2.0ha)	19(41.1)	26(38.0)	19(38.5)	28(34.0)
Semi-medium (2.0 to 4.0ha)	10(22.3)	25(36.0)	11(921.2)	31(38.3)
Medium (4.0 to 10.0ha)	1(3.0)	7(9.7)	1(1.9)	6(7.4)
Large (10.0 to above)	Neg(0.1)	1(0.8)	Neg.	1(1.2)
All 43?	47(100.0)	69(100.0)	52(100)	82(100.0)

Source:Mizoram Integrated Development Project Report.

Substantial number of holding in both counts were in smaller size group categories showing skewed distribution of holdings as found elsewhere in the country.The over-all average showed a marginal increase from 1.5 ha in 1980-81 to 1.6 ha during 1985-86.

CROPPING PATTERN.

Rice is the major crop covering an area of 61927 ha(58.8 %) followed by maize with only 6781 ha. (6.44 %)According to Department of Agriculture Statistics fruit covers 9.70 %,vegetables 7.93 % and spice crops 3.66 % of total.Area covered under horticultural crops is 22.42 ha including root crops.

58.80
6.44
9.70
7.93
3.66
86.53

Table 2.3.RICE AREA PRODUCTION AND PRODUCTIVITY DURING DIFFERENT YEARS.

Year	Area (000 ha)	Production (000 tonnes)	Production (Kg/ha)
1985-86	49.00	45.30	924
1986-87	48.30	45.80	948
1987-88	48.50	49.20	1014
1988-89	50.60	54.70	1081
1989-90	52.99	59.24	1179
1990-91	51.32	63.79	1243
1991-92	55.64	70.97	1276
1992-93	61.30	83.95	1370

Source:Mizoram Integrated Development Project Report.

CHAPTER+ III

STATUS OF HORTICULTURE CROPS IN MIZORAM .

INTRODUCTION.

Out of the total area of 21 lakh hectares, potential areas available for horticulture crops is around 4.40 lakh hectares.The existing areas under horticulture of 25,000 hectares account only 5.68 % of the total potential areas.As such,there is a vast scope for further horticulture activities in Mizoram.According to demarcation of 15 Agro-Climatic Regions in the country Mizoram falls under Sub-Region No(iii) of Eastern Himalayan Zone II.It enjoys tropical and Sub-tropical climate where most of the horticultural crops flourish.

Kind wise status of various sub-groups are reviewed below:-

1.FRUIT CROPS.

The main horticultural crops are citrus like Mandarin,Orange,Sweet Orange,Hatkora,Assam Lemon,Kagzi lime,Jamir,Banana,Pineapple,Papaya,Passion Fruit,Guava and Mango.However,only Mandarin Orange,Pineapple and Banana are cultivated on commercial basis.

With regard to citrus plantation,rejuvination of old and unproductive trees was started during 1991-92 which gave succesful results of the crops in the next years fruiting.The improvement aimed at is prophylatic measure especially in the case of dieback disease

which has started emergence in a number of orchards.The cultivation of the above mentioned three fruits crops of mandarin orange,banana and pineapple are extended by supplying planting materials to the farmers at cent percent subsidies during 1989-90 to 1990-91.Assistance has also been given to the farmers for jungle clearance,pit digging weeding and basket fencing for citrus crop under horticulture expansion programme at the rate of Rs 5200/- per hectare.But now the scheme is no longer in operation and the Rural Development Department started taking up in a selected Community Development Blocks under New Land Use Programme(NLUP).Apart from citrus,banana and pineapple fruit crops,one crop called passion fruit has started gaining popularity and the Government is very much alive to this and shortly appropriate processing plant is to be set up in the state.

2.SPICE CROPS.

During monsoon,Mizoram has good climatic conditions required for the cultivation of spices crops like ginger,turmeric,chillies,pepper,cinnamom and cardamom.All these crops will be cultivated on commercial basis during the 8th plan period and the present area and production of different spices crops in the last five years are as follows:-

TABLE 3.1 .PRODUCTION OF SPICES CROPS.

A=Area in ha. P=Production in MT.

Name	1988-89		1989-90		1990-91	
	A	P	A	P	A	P
Spices	3,433	10,457	4,123	13,443	4,650	11,978

Name	1991-92		1992-93	
	A	P	A	P
Spices	3,842	8,345	3,855	11,190

Source:Survey Data,Directorate of Horticulture.

Among the spices crops ginger area had varied between 2068 ha (1990-91) to 2909 ha during 1990-91.Due to its unstable market price the production cannot be encouraged in a larger scale.However,its cultivation is very popular because of easy management and that people can earn their livelihood if the market is good and give a remunerative price.However it had to be marketed outside the state and it is only occassionally that Mizoram ginger command reasonable rates at Silchar,Guwahati,Calcutta, Patna etc.The local variety of ginger which has been grown in Mizoram is fibrous and low in oleorasin and oil content. Lately, a new variety(Nadia) has been introduced to replace the local varieties.Scheme is also on the anvil for sun-drying of ginger so that whatever green ginger is left

after meeting the local demand,the same could be dried and thus ensure reasonable prices outside the state.As per the existing marketing system,the area under ginger as at present(745 ha during 1991-92 and782 ha during 1992-93) against 2397 ha during 1989-90 seems to have shrunk because of marketing problem of fresh ginger.

The cultivation of turmeric is very small in comparision with ginger and the production also is low. However,improvement of its quality seems to be required due to less content of curcumin.Therefore it is proposed to increase area under cultivation upto 400 ha at the end of the 8th plan.Pepper and cardamom are the two spices crops for which the state government is seriously planning to bring increased area under such crops.Planting material is being multiplied and farmers had been sent to Sikkim and Kerela to study the pepper and cardamom cultivation.

3.VEGETABLES.

Many varieties of vegetables are grown in Mizoram and most of these meet the local demand.One vegetable which is typical for this state is Squash,large quantities of which are marketed outside the state at Silchar.There are no firm estimates regarding the quantities of squash marketed in Silchar.The cross section estimate for a period of five months(May-October) indicate

that about 800 quintals of squash was marketed everyday to Silchar.The Farmers' Co-operative Societies and the state government keep tab on the rate at which squash is sold outside the state.

Under Vegetable Development Scheme provision is made to distribute seeds and seedlings at 50 % subsidy and more emphasis will be given to those items which are having high nutritive value.

4.FLORICULTURE.

Floriculture has also gained popularity especially in and around town areas and the interested growers are sent to study tours to New Delhi,Bangalore etc .to see the Flower Show and 'Mela'.It is a new introduction to urban and some rural areas and play and important role which can earn a living to small and marginal farmers in nearby town areas.

5.ROOT AND TUBER CROPS.

Under root and tuber crops,potato, cassava,colocassia and sweet potato are cultivated and the area under cassava is increased recently to meet the requirement of plant meant for feeding animals.A Master Plan for Development of Horticulture Crops is being prepared by Agriculture Finance Corporation and the Plan is yet to be finalised.The target areas tentatively fixed

for different crops are as follows:-

Table 3.2.TARGET AREAS FOR DIFFERENT CROPS.

1.Fruit crops	33,900 ha.
2.Vegetable crops	10,350 ha.
3.Spices crops	12,850 ha.
4.Plantation crops	4,935 ha.
5.Floriculture crops	250 ha.
6. Root & Tubers ?	

Source:Directorate of Horticulture,Survey Data.

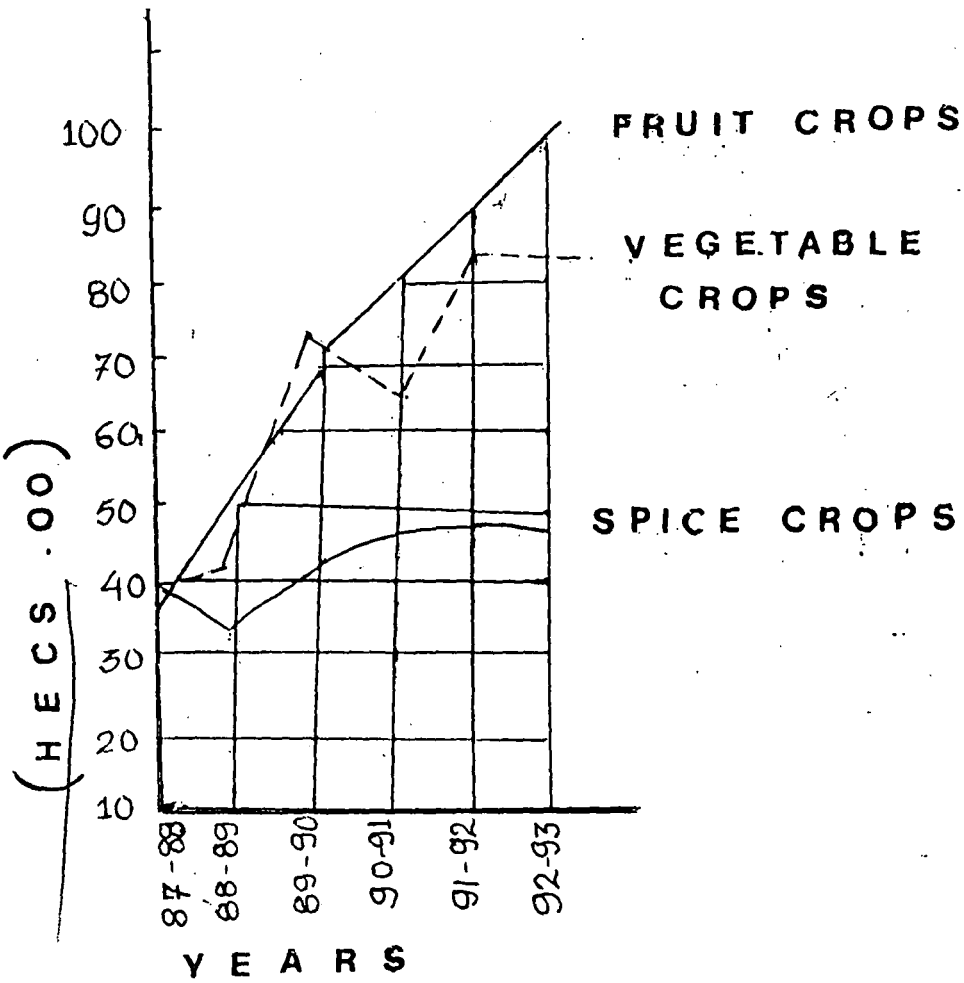
A Master Plan which is being prepared with 15 years projection will be effective from 1993-94 and will involve financial outlay of Rs.20 crores.

The State Horticulture Department Which was seperated from the Directorate of Agriculture on 7th June 1993 has estimated potential horticulture area in Mizoram.Out of the total area of 21 lakh hectares in the state it is felt that all area under gentle to moderate slope is fit for this group of crop which is estimated to be 4.40 lakh hectares.As per this estimate the State Government has accounted for the 1992-93 area of 22,434 ha. to cover 5.60 percent of the total potential area. Here also it is felt that the gentle-moderate slope of different hill systems is guess-estimation with reliability being of the same character as in case of land utilisation statistics.In respect of cropping details of the six

CHART NO. 3.1

AREA UNDER HORTICULTURE CROPS

(1987—88 to 1992—93)



year period,it is found that the area under horticulture crops in the year 1992-93 was 21.29 % of the total cropped area.The following table will make it clear.

Table 3.3.AREA CROPPED AND THAT UNDER HORT. CROPS.

Year	Total cropped area	Area under hort. crops	Percentage col.3 to col.2.
(1)	(2)	(3)	(4)
1987-88	71,934	11,538	16.04
1988-89	75,385	12,665	16.80
1989-90	90,658	18,946	20.90
1990-91	94,791	19,550	20.62
1991-92	102,876	21,568	20.97
1992-93	105,310	22,424	21.29

Source:Agro-Horticulture Survey.

The above table revealed that there has been 46.40 % increase in total cropped area and the area under horticulture crops has registered 94.35 % increase in past six years.

Data available for last six years in respect of horticulture crops is classified into three sub-groups,i.e. fruits,vegetables and spices is indicated in table 3.4.

Table 3.4 AREA UNDER HORTICULTURE CROPS IN MIZORAM.

Area in ha.

Sub-Group	1987-88	1988-89	1989-90
1.Fruit crops.	3,760	4,957	7,201
2.Vegetable crops	3,801	4,075	7,622
3.Spice crops	3,977	3,433	4,123
Total=	11,538	12,665	18,946

Sub-Group	1990-91	1991-92	1992-93
1.Fruit crops	8,133	9,353	10.211
2.Vegetable crops	6,762	8,373	8,354
3.Spice crops	4,650	3,842	3,859
Total=	19,550	21,568	22,424

Source:Agro &Horticulture Survey, - - - - ?

PRODUCTIVITY.

Productivity per hectare is an important indicator for evaluating the progress and status of horticulture industry in a state.The following table indicate the highest,lowest yield thus far recorded over the six year period i.e, 1987-88 to 1992-93.

Table 3.5.YIELD OF HORTICULTURE CROPS IN MIZORAM FOR THE SIX YEAR PERIOD 1987-88 to 1992-93.

Crop	Yield tonne/ha	
	Highest Yield	Lowest Yield
1.Orange	4.96	3.09
2.Banana	7.38	3.78
3.Pineapple	7.61	4.51
4.All fruits	6.11	3.74
5.Squash	42.56	15.00
6.All vegetables	8.84	4.69
7.Chillies	1.33	0.47
8.Ginger	8.71	3.62
9.All spices	3.26	1.98
All horticulture crops	5.34	4.17

Source:Agro-Horticulture Survey.

The above set of figures indicates a wide variation over the lowest and highest yield recorded in Mizoram over the six year period.The following table shows

development of horticulture in Mizoram.

Table 3.6.DEVELOPMENT OF HORTICULTURE IN MIZORAM.

Area add Production of horticultural crops during the last five years.

A=Area-(in HAC),P=Production-(in MT)

Sl. No.	Name of Horti.Crops	1988-89		1989-90		1990-91	
		A	P	A	P	A	P
1.	Fruit crops	4,957	30,271	7,201	34,906	8,133	32,264
2.	Veg. crops	2,467	12,870	5,088	43,782	4,775	38,403
3.	Spices crops	3,433	10,457	4,123	13,443	4,650	11,978
4.	Root crops	1,808	8,070	2,534	8,954	1,992	9,756
Total:		12,665	61,668	18,946	1,01,085	19,550	19,40

Sl. No.	Name of Horti.Crops	1991-92		1992-93	
		A	P	A	P
1.	Fruit crops	9,353	34,923	10,211	43,668
2.	Veg. crops	5,642	40,833	5,203	45,978
3.	Spices crops	3,842	8,345	3,855	11,190
4.	Root crops	2,732	12,870	3,155	19,150
Total:		21,569	96,971	22,424	1,19,986

Source:Directorate of Horticulture

From the figures it appears that production of fruits had gone up from 30,271 MT to 43,668 MT from 1988-89 to 1992-93.Likewise,considerable increase in production of vegetables,spices and root crops is made. Central assistance have also been utilised with desired results.The following Central Scheme are being utilised in the state:-

(1)Integrated development of tropical and arid zone fruits.

(2)Integrated programme for development of spices.

(3)Nutritional Garden.

(4)Production of fruits and vegetables.

(5)Sprinkles/ Irrigation.

Besides these schemes,a number of shemes are coming up within the new financial year for post harvest infrastructure,betelvine,floriculture and temperate fruits development.Detailed proposal is being prepared for the consideration of the State Government.

HORTICULTURE IN MIZORAM VIS-A-VIS NORTH EAST REGION(NER).

The North Eastern Council Publication Basic Statistics 1992 has given data in respect of all the North Eastern States for horticulture crops for 1990-91. During the year 1990-91 total area under fruits,vegetables and spices in the North East Region was 5.08 lakh ha. the highest area being in Assam(2.67 lakh ha.) followed

by Meghalaya (0.80 lakh ha.) and Tripura (0.65 lakh ha.). Mizoram reported only 0.15 lakh ha. under horticulture during the same period.The following table gives area proportion under fruits,vegetables and spices in the North Eastern States:-

Table 3.7.PERCENTAGE OF HORTICULTURE CROPS IN DIFFERENT STATES DURING 1990-91.

Sl No.	State	PERCENTAGE OF AREA UNDER Fruits.	Vegetables.	Spices	All hort. crops.
1.	Arunachal Pradesh	6.0	9.2	3.3	7.3
2.	Assam	40.5	59.4	57.6	52.5
3.	Manipur	11.0	3.2	6.8	6.4
4.	Meghalaya	17.5	13.0	21.9	15.8
5.	Mizoram	4.1	1.5	5.2	2.9
6.	Nagaland	1.6	3.1	0.4	2.3
7.	Tripura	19.3	10.6	4.8	12.8
Total=		100.0	100.0	100.0	100.0

Source:Mizoram Integrated Development Project Report.

It is clear from the above table that Mizoram occupies a minor position as far as area and production of horticulture crops in NER is concerned.It may be mentioned that in order to improve its position Mizoram will have to concentrate on its specialities like Squash,Pine-apple,Orange, etc.Amongst fruits,its main fruits are oranges

banana, and pineapple.Chillies and ginger are two important spice crops.In respect of these specific items comparative area/ production in Mizoram and the NER is indicated in the following table.

Table 3.8.AREA AND PRODUCTION OF HORT. CROPS (1990-91).

Crop	Area(000'ha)		PRODUCTION(000'tonnes)	
	MIZORAM	NER	MIZORAM	NER
Fruits				
Orange	2.8(13.1)	21.4	9.5(9.1)	104.9
Banana	2.7(5.4)	50.1	15.0(4.23)	353.0
Pineapple	0.8(2.6)	30.2	48.0(1.6)	307.8
Spices				
Chillies	2.3(10.0)	23.0	3.2 (18.1)	17.7
Ginger	1.1(7.6)	14.5	6.4(4.5)	143.4

N.B.Figure in bracket are Mizoram area/Production of NER total. percentage?

Source:Mizoram Integrated Development Project Report.

CHAPTER-IV

MARKETING OF HORTICULTURE PRODUCTS.

The objective of all economic activities is the satisfaction of human wants.In order to achieve this objective,the manufacturers,miners and farmers undertake production of goods and services.But they will fail to achieve their objectives if the goods and services produced do not reach the consumers who demand them at a time when they need them.It is marketing which helps making goods useful to the society by getting them where they are wanted and by transferring them to those people who want them.

EXISTING MARKET CONDITION IN MIZORAM.

The existing market condition even in the capital is deplorable.In the absence of basic facilities farmers are compelled to display their produce on the roadside and exposed to flies,dust,mud,sun and rain.Lack of even the basic infrastructural facilities hits the farmer hard and in the case of peri-shable commodities quality deterioriation is even higher and lack of storage facilities in the market also prompts the farmer to sell his produce at whatever price he can sell.

The horticulture produce is either sold in the local nearby town or sent to distant market within the state.Only few commodities are sent outside the state.

LOCAL SALES FOR INTERNAL CONSUMPTION.

Under this system the produce is sold in roadside stalls or in the nearby town or city.Sheds on roadside are set up by the sellers who are either producers or local women.The stalls in the town and cities have generally been constructed by the Department of Agriculture.Several sellers use the same shed and local demand is met by these sale points.The producer gets maximum returns under this system.The producer's share in consumers(buyers) payment may be 80% to 90%.This system should be encouraged and handling and storage made more scientific and efficient.This will prevent spoilage and wastage.Another advantage is the employment of local people mostly women.A quick survey revealed that the products are being sold at fairly good prices even in the interior.For instance,pineapple was being sold at the rate of Rs. 20 for three pieces,banana Rs. 12 per dozen,cucumber(big ones fully ripe) Rs. 1-2 each,lemons Rs 10 for 6 fruits.The rates are much higher than many distant markets.

TOWN AND CITY MARKETS.

Surplus produce from these areas is brought to towns and cities to meet the requirement of town population.There is a busy fruit and vegetable market at Aizawl which sells a wide range of commodities by the small scale retailers many of which are producers.In

addition to,fruits and vegetables juices,fish and other products are also sold here.

LONG DISTANCE MARKETING.

The nearest market for Mizoram is Silchar. Only few products are sent to Silchar.These are squash, sometimes ginger,small quantities of chillies(green) and banana.Only bulk selling is of squash which start from May and end in October.In peak period of June to September about 400 quintals arrive daily while it may be 200 quintals in May and October.It may be mentioned that the growers are exploited by the middlemen who joins hand to make capital out of unorganised growers.Ginger consignments do sometimes go to Guwahati.The importance of long distance marketing cannot be overemphasized. Future planning has to take this into consideration.For example,squash production is more than 50 % of the entire vegetable production(24728 out of 48978 tonnes in 1992-93) because of its large scale market in Silchar.

BORDER TRADE.

It is a common knowledge that middlemen do come to Mizoram and bargain for the purchase of fruit crops.The main commodity in this respect is squash and orange.Hatkora is also purchased.Other products also cross the border in small quantities.Extent of trade is

not much known in this respect.There are all conjectures. Also sources informed that majority of orange production goes to Bangladesh.

COMMON MARKETSHED.

The people of the three adjoining countries (Mizos,Bangladeshi and Burmese) have had historical links in production,culture and trade.Production planning marketing and trade got interlinked as a common economic zone.Boundaries of the countries came much later.Still trade continues.Then came barriers and check just to control or prevent illegal trade.This has given a serious set back to perishable horticulture industry in the North Eastern Region.Their marketshed areas have changed from next door to over thousands of kilometres of rugged roads, time consuming,expensive and waste prone system.

MARKETING SYSTEM/FACILITIES.

There is no proper system followed for marketing produces of horticulture crops.No proper grading system is in operation and no grading yard is established.However,the Government of Mizoram recently established the Mizoram Agricultural Marketing Corporation Ltd.(MAMCO) to deal with the procurement and marketing of agricultural and horticultural surplus produces like ginger,chillies,squash etc.As for orange fruits,the growers sell their surplus produce to outside traders through negotiation.

The Department of Agriculture is now undertaking construction of one cold storage near the capital town of Aizawl for storage of vegetables and fruits.This storage facility will be the first of its kind in the state and has the capacity of 400 MT.Besides this,the Department constructed a number of godowns and market sheds in rural areas to facilitate the poor farmers to store their surplus produces and sell in the market. The number of rural godown and market shed constructed so far is 7 no's and 25 no's respectively.

PROCESSING.

For the development of horticulture industry processing is a must.It is a common knowledge that processing is an integral part in the advanced countries for the expansion of horticulture industry.It is also a necessary adjunct and provides great support for the horticulture production and programme.As far as Mizoram is concerned bulk of the ginger and chillies production in future should be and will be dehydrated which is a part of processing.However,scope of processing of fruits and vegetables is commodity specific and its market value will be in competition with similar products from rest of India.Unlike fresh fruits and vegetables their processed products are available throughout the year.These are

also generally manufactured in the whole country unless the raw material is not available elsewhere.The cost of production in the plains of India is cheaper as excepting raw material everything else is brought from outside.The choice of processing factory and the products has therefore to be made with great care and thought.

Mizoram has at present four processing units. An additional plant is under construction.The existing plants had unsatisfactory result and had been even nonfunctional for quite sometime.These may be because of old machinery,lack of infrastructural facilities,inadequate supply of raw material and even wrong planning.An additional plant which is projected to cost Rs 177.25 lakhs is under construction.The service of Central Food Technology Research Institute,Mysore (CFTRI)have been commissioned on turn-key basis for implementation and satisfactory completion of the project (MIDP) by end 1993 early 1994.The situation of plants is as under:-

(1) Fruit Preservation Factory,Vairengte,since renamed Food Preservation Factory,is cuttently engaged in canning of Baibing and Rawtuai (Bamboo Shoots).The plant is planned to process Pineapple,Orange,Baibing etc. with processing capacity of one tonne per day.

(2) Ginger oil and Oleoresin plant,Sairang,Since renamed (Spices Processing Plant), is being organised to

process Turmeric,Ginger chillies,Tapioca. It is expected that the plant should be working for six months in the year.

(3) Maize Milling plant,Khawzawl with a capacity of 3.2 tonnes per day.However,Maize is not available to the extent of the plant's capacity.

(4) Ginger Dehydration plant,Sairang. Since renamed Food Processing plant to process Orange,Pineapple,Passion fruit,etc

(5) Fruit Juice Concentration plant,Chhingchhip under construction.The management of some of there units had change hands more than once.Every new comer is enthusiastic and hopes are genetated that now it will opetate sucessfully.

MODERN MARKET FOR HORTICULTURE PRODUCTS

Horticulture production in Mizoram is planned for improving the economic status of the people as also optimisation of production and income per unit area(land).Thus, it is necessarily a production strategy for in excess of the local requirements for marketing to other states in India and abroad.The Government of Mizoram has taken the right steps in creating organisations for the processing(MIFCO) and marketing(MAMCO) of horticulture produce.The Mizoram Agricultural Marketing Corporation(MAMCO) can play a crucial role if managed efficiently.

Presently,Mizoram does not have any disciplined,organised and regulated market which could cater to the specific requirements of Mizoram.This could be done

only through an Act which should ensure market operations in disciplined and regulated way.It is gratifying that Government of Mizoram is now contemplating to enact,"The Mizoram Agriculture Produce Markets Bill." This would be essential and a necessary pre-requisite for scientific organisation of the marketing systems.The bill has been drafted on the pattern of other states like Haryanu, Punjab etc.whose major surpluses are durable crops.In contrast,Mizoram has a very little (or no) surplus agriculture produce.The market (s) will be primarily for the surplus produce (surplus to Mizoram requirements).The existing marketing system is such that internal requirements of towns/villages are met locally and only surplus commodities will come to Aizawl or other cities for sending outside besides meeting part requirements of the city.As such major emphasis has to be to develop Aizawl as a distribution market from where commodities are despatched to consuming markets.This can be a substitute of Silchar market to a major extent.For this purpose,special facilities will be required to be provided to wholesale purchasers (both Mizoram residents and outsiders) so that they could purchase in bulk and despatch to major consuming markets eleminating (at least to some extent) even Silchar.They will need shops,sheds for grading and packing,storage space,trucking and loading facilities,a network of reliable communication system,reliable and efficient market information and

Intelligent Service for all other important markets.This has to be done if Government of Mizoram desire to have best bargain in their own Territory and under their regulations.

Silchar is no doubt the major market for Mizoram perishable products.However, it is not a regulated market and is exploited by commission agents and their association.They are taking the advantage of their locations and are exploiting the growers of Mizoram as well as Tripura, Manipur,Assam and Meghalaya.It is necessary that the governments of these states should work unitedly as per regulation of Silchar marker and nomination of the representatives of producers from where the produce comes, only by such a united action, that the interest of growers will be protected in these states.

MARKETING PROBLEMS : Under the existing market system in terminal market,there are too many sellers and too few buyers. Thus,these markets have become buyers market where the sellers(growers) compete with each other to sell their produce. The buyers,wholesalers and retailers are few and many times (rather most of the time)they join together to exploit the situation at the cost of the growers.The farmers(or producers) have no say in the market rates, mode and method of handling of their produce and allied aspects.What further accentuates the situation is almost absence of the producers from the markets.The marketing is an off farm activity

and cannot be attended by the producer himself in far off places.Each consignment represent a farmer.In fact, these market have become middlemen oriented and operated markets particularly where the market(s) has not been regulated (Silchar).These problems need to be overcome in a modern marketing system.

One example of exploitation can be noticed from Squash marketing.Of course,the Goverhment of Mizoram fixed the rates or procurement price.However, the commission agents of Silchar joins hands and agreed to pay not more than Re 1 per kg. eventhough the actual or intensive sale rate in the market may be Rs 2 or so. This was due to too many individual growers keen to sell their produce.This is also another problem to overcome.

Another example of exploitation of the producers is the cartel of the transporters.They charge both ways(Silchar to Aizawl and back).While coming to Aizawl they charge about Rs 4000 on the plea that they do not get load on their way back.However,they do bring load in many cases.For instance,about 25,000 tonnes of Squash alone was produced in Mizoram in 1992-93.This needs about 3000 trucks trip at the rate of Rs 2000 per truck load.This should mostly a return journey and cost growers of Mizoram a huge sum of money.

8½ Lakhs
25-0000
3,0000

CHAPTER-V

NEW LAND USE POLICY AND HORTICULTURE.

In the wake of the central government proposal to implement the Integrated Rural Development Programme for the entire Community Development Blocks of the country from 1979 -1980, the Government of Mizoram has also started to draw up a new scheme for rural upliftment under the integrated programme by evolving a New Land Use Policy (NLUP).

The main occupation of rural people in Mizoram is Hill Side Cultivation ;shifting from one place to another yearly.Shifting hill side cultivation not only damages soil fertility,ecology and forest wealth but rendered the cultimation most unproductive.Mizoram administration has therefore taken up steps to elevate the depressed economic situation by evolving new programme which will enable the rural people to improve their economy by taking up various schemes offered by the State Government for permanent occupation.Each of these schemes are worked out to suit the capabilities of a normal rural family with Government Assistance within the ceiling of Rs. 30,000 per family.

To establish permanent occupation in horticultural/Plantation operation is one of the main objectives of NLUP.Initially,the scheme goes by the name of 'Garden Colony' with the objective of colonizing selected families

in suitable farm lands for permanent agricultural operation. The scheme is intended to colonize several families in a compact area of settlement in order to introduce progressive horticulture plantation in a confined manner, with a hope ultimately lead them to abandon shifting cultivation. The physical achievement of Garden Colony Scheme for the first two years of operation is given in table 5.1 below:

Table 5.1 PHYSICAL ACHIEVEMENT OF GARDEN COLONY DURING THE FIRST TWO YEARS.

Sl.No.	Categories	1977-78	1978-79
1.	No. of Villages	10	31
2.	No. of families	100	1445
3.	Area in hectares	200	1445
4.	No. of seedling distributed	195659	638945

Source: Department of Agriculture, Notes on Agriculture 1981

Development of horticulture settlement has also been undertaken during the Sixth plan and projected the estimated cost of developing horticulture as shown in table 5.2. As seen from table 5.2 during the first years 23.79 % of the total expenditure was given to beneficiaries and so on. Mention may be made that one weakness of the scheme is lacking in fixing a target to be achieved

within a stipulated time when the flow of expenditure is distributed year wise in a planned order.

Table 5.2.YEAR WISE EXPENDITURE ON HORTICULTURE DEVELOPMENT DURING THE SIXTH PLAN.

Sl. No.	Year	Expenditure	% to total
1.	First year	Rs.3450	23.79
2.	Second year	Rs.6050	41.72
3.	Third year	Rs.2100	14.48
4.	Fourth year	Rs.900	6.21
5.	Fifth year	Rs.2000	13.80

Source:Govt. of Mizoram:Sixth Five year Plan,Aizawl.P-96.

In 1987-88,annual plan period,the State Government singled out Aibawk Community Development Block for intensive operation of the Jhum control programme under the caption,"Aibawk Jhum Control Project".This was the first instance whereby concerted efforts have been rendered to implement the scheme of New Land Use Policy. Accordingly,beneficiaries were mostly of the Mizo Jhumia families of 16 compact area covering 2069 households.Out of these,horticulture development draw the largest number of families,i.e,46.15 % families out of the total number of beneficiaries.

Table 5.3. No.OF BENEFICIARIES FOR HORTICULTURE DEVELOPMENT UNDER NLUP DURING 1987 - 88, 1991 - 92.

Trade	NO.OF FAMILIES 1987-88, 1991-92		% to total
Horticulture	889	955	46.15

Source:Survey Data, Rural Development.

Under Agriculture and Allied Sectors of NLUP, there are about 18 different items of trade, which are broadly classified into paddy field plantation of horticulture,sericulture and pisciculture.Plantation of horticulture crops covers the following.

(a) Orange (b) Lemon (c) Mango (d) Valencia
(e) Coconut (f) Areca Palm (g) Tea (h) Sugarcane
(i) Pineapple (j) Banana (k) Passion Fruit
(l) Aleurite (m) Pisciculture (n) Sericulture etc.

One important point to be noted is that the Government does not promptly give assistance to farmers.It took a special care in this respect and selection of beneficiaries has been done on the basis of household survey conducted in every village covered by the Programme.It is intended to give the first priorities to the Jhumia families in selection of beneficiaries.Secondly, in the list of priority are those household who are partly dependent on Jhum cultivation.Thirdly, those families, neither

depending on shifting cultivation nor having permanent occupation for their livelihood consisting of able bodied member capable of rendering physical assistance.

Apart from financial assistance, assistance is also done by providing seeds and seedling to beneficiaries. The following table shows material assistance issued to beneficiaries upto 1993.

Table 5.4. SEEDS AND SEEDLINGS DISTRIBUTED UPTO 1993

Sl.No.	Crops	No's
1.	Orange	3,800,000
2.	Lemon	50,600
3.	Coconut	9,300
4.	Valencia	19,500
5.	Areca Palm	1,443,000
6.	Passion Fruit	170,000
7.	Coffee	12,000
8.	Tea	1,380,000
9.	Aleurite	801,000
10.	Sugarcane	6,390,000
11.	Teak	195,000
12.	Citronella	700,000
13.	Pineapple	8,820,000
14.	Banana	1,276
15.	Mango	1,200
16.	Grape	941

Source: (Mizoram Profile of NLUP)

Though only four years have passed since its inception in 1990-91, implementation of NLUP has rendered impressive and substantial achievements in the fields of horticulture. A good number of families who have opted crops of short gestation period such as banana, pineapple, passion fruit and sugar cane plantation etc. have been able to raise their economy above poverty line. Along with the annual and systematic expansion of the area of NLUP implementation, area of large scale plantation of horticulture crops and other commercially viable trees like Aleurite is also increasing proportionally. Most of the plantation needs 10 years as gestation period. Considering the present condition of the standing crops, at the end of the decade from now, it is anticipated that the crops will begin to bear fruits which will herald the dawn of prosperity for the rural people.

One point to be mentioned is that many of the beneficiaries did not use the assistance they received in the right channel. It is also known that they did not utilise the whole capital they received in their respective work and divert the fund for other purpose or even buy some luxurious goods. If the assistance they received had been utilise in the right direction and right purpose, the achievement of NLUP would be much greater.

CHAPTER - VI

PROBLEMS OF HORTICULTURE DEVELOPMENT

There are various problems faced by the horticulture sector some of which are really formidable,To overcome these problems attempts have been made but its chance of success is very little.Unfortunately in many cases (if not all) treatments have been prescribed with proper diagnosis based in detailed and indepth investigations in relation to local conditions.However,many prescriptions are based on experience or recommendations of other areas.It may be said that some of the major constraints are the geographical situation, rugged terrain and only one outlet or communication route with the rest of the country.Even this route (NH 54) is not properly maintained. There are numerous depressions and landslides affecting outgoing and incoming commodities.It is more difficult for perishable horticulture products.

The problems faced by the horticulture industry may be studied under the following heads :-

(1) LONG DISTANCE FROM MARKETS AND BORDER TRADE: ? Absence of markets ?

Mizoram have no more historical links with the neighbouring countries at present which it happens to have in the past.The nearest big market is Calcutta.It is estimated that a truck load of good costs Rs 15,000 to 18,000

from Aizawl to Calcutta.It will be another Rs 7,000 to 10,000 from some of the growing areas.No agricultural product, the least perishable can absorb such a high incidence of transport on a rugged and a bumpy road.It may take one or two weeks from Mizoram to Calcutta by which time most of the perishables may be damaged.

(2) INADEQUATE TECHNOLOGY : The application of scientific technology in the state is minimal and indeed poor.It may perhaps be one of the poorest technology base in the country.In many cases it appears as if we are in the thirties or at forties in terms of application of technology.Many an experts of course visits produce paper reports which may or may not be applicable to local condition.

In most of the area, the hill slopes are generally steep.Agricultural and horticultural operations is troublesome and more costly in such areas.This also results in soil loss and degradation under the existing practices particularly with high rainfall and steep slopes.The horticulture farmer is generally poor, and does not have enough capital to purchase latest scientific equipment.In most of the areas,tradition method of farming is still prevalent.

(3) TRANSPORT PROBLEM: One of the problems faced by the horticulture sector is transport problem.For instance, transport cost between Aizawl and Silchar is more than double as compared to similar situations in the hill areas of North Eastern Region.A truck load (about 7 - 8 tonnes) for

a 185 Kms journey from Aizawl. The trucking companies charge both ways (for back journeys as well) on the plea that they have to come back empty. Generally, they do not show any booking from Aizawl to Silchar though a good deal of freight is available particularly from May to November. Taxi charges between Aizawl and Champhai (185 Kms.) is Rs 2,000 one way. This is itself an indicator of the serious transport problem.

There is a very little co-ordination between even the Seven North Eastern States in agriculture and horticulture development, marketing and processing despite the well known fact that market for all of them is the same. The role of central organisation like North Eastern Council (NEC) and North East Region Agriculture Marketing Corporation (NERAMAC) has not been effective at least in these aspects.

(4) PRODUCTION CONSTRAINTS: Productivity per unit area are is low and there is unstable production from year to year. The following factors contribute to this situation. Among these are :-

(a) Inadequacy of technologies specially suited to the area.

(b) Wide gap in technology available and actual application in the field.

(c) Poor free canopy and free management.

(d) Lack of integrated pest control.

(e) Absence of appropriate tools, implements and machinery and shortage of skilled labour.

(f) Menace of wild animals and stray cattle in some areas.

(g) Water use inefficiency in irrigated areas.

(5) POST HARVEST,HANDLING AND PROCESSING CONSTRAINTS :

Non-existence of post harvest quality control is another factor responsible for less productivity in the horticulture sector,It resulted in considerable wastage and damage of crops.A part of the horticulture produce handling and marketing is done by the middlemen who do not bother about maturity standards,grading and scientific packing.Absence of pre-cooling,cold-storage and precessing facitities hindered the pace of horticultural development. As most of horticulture crops are perishable,they have to be sold as quick as possible so that farmers will get their renumarative price.Many time growers have to sell their produce at a throw away price.This leads to lack of incentive to produce more on the part of the growers.

(6) OTHERS : In order to reveal other problems and constraints of the horticulture industry,let us split up into points:

(1) Poor government investment on horticulture.

(2) Absence of long range planning for fruits and other perennial crops.

(3) Inadequate (or non-existent) linkages between production,marketing and processing.

(4) Inadequate and insufficient research support and linkages.

(5) Absence of state policy document on the promotion of horticulture crops in future.

(6) Absence of inadequacy of orientation and training in new technologies.

(7) Poor data base and sometimes wrong figures.

(8) Inadequate or mostly non-availability of credit.

(9) Poor linkage between research and extension.

10) Lack of interstate co-ordination amongst the States sending produce to common markets (say Silchar).

In nutshell, it may be concluded that horticulture sector in Mizoram has many serious problems and many stumbling blocks on its way to development.To overcome this situation it is necessary that the Government and various agencies, as well as the middlemen and growers should work unitedly so that most of the problems can be solved if not all.

CHAPTER - VII

PROMOTION OF UNEXPLOITED SPECIES OF COMMERCIAL IMPORTANCE IN MIZORAM

The fruits and vegetable crops have made some progress in the expansion of the industry.In the process some of important crops which have immense potential under Mizoram conditions and its geographical location did not get the importance they deserved.Most of these are high value low volume durable products.These should at least now get proper place in the development plans one important point is that even without proper planning and the required technical back up horticulture development has been taking place.The government should bear in mind that there are some crops if given special importance would contribute a lot of income to the growers as well as the government.The crops which fall in this category are Cardamom,black pepper,Tung(Aleurites).Another crop which can be of commercial importance is passion fruit.Then there is Pear.Though not a durable crop (or low volume) it bears heavily and will be a good economic proposition for the producers.

Thus, as a result of field visits and studies it was found that some additional crops like Passion Fruit, Tung,Pear,large Cardamom etc. could be expanded rapidly. Let us study them one by one.

1. CARDAMOM : Cardamom also known as Queen of Spices has a good performance in the existing plantation areas especially in the Eastern belt of Mizoram.Large cardamom had been procured from Sikkim during 1978 - 79 and they are now in production stage,but due to some reasons like improvised drying and curing method,low market rates and poor marketing infrastructures,the farmers neglect their plantation with less returns from their plantation.But now the farmers themselves are trained in the new technology of sun-dry and curing.Assistance from the spices Board or from the Cardamom Board will be sought in establishing this new processing plant.SmallCardamom will also be introduced as this spices are having more economical values than Large Cardamom.

Cardamom is consumed in large quantity in India. However, in Mizoram it is not so pupular compared to other states.During the 6th plan (1980-85),435 families cultivated large Cardamom, and during the 7th plan (1985-90), 642 families cultivated it.It is estimated that about 1077 families in Mizoram are engaged in Cardamom plantation.

2. PASSION FRUIT : Passion fruit has adopted itself admirably well to Mizoram Agro-climatic conditions particularly in the comparatively cool Champhai region.(North East).There is no doubt that Passion Fruit will grow very well and produce well in many parts of Mizoram.However, the real test of its suceess will be the commercial exploi-

tation.The Government of Mizoram has decided to set up juice concentration plant(s).Almost entire production is proposed to be converted into juice concentrate.The MIFCO has already initiated the works and constructed the building at Chhingchhip (77 kms.from Aizawl).

The Government agencies have become enthusiastic. The speed and enthusiasm with which people and Government of Mizoram are going about this will make this fruit as a leading horticultural crop in the State or even in the Country.It was emphasized that the success of passion fruit cultivation will ultimately depend upon not only their capacity of making concentrates but also their sales in competition with other juice and soft drinks in India and foreign markets.The variety being now planted has 30% juice (of fruit weight), with 20% TSS (Total Soluable Solids).If they plant about 5000 ha, in next five years they will equal to 17000 tonnes of single strength juice which has to find a market.Furthermore,at present the rate of procurement at Rs 5.00 per kg of fruit, one kg of single strength juice will require raw material (fruit) costing Rs 16.35 as compared to about Rs 2 to 3 in case of apple,mango, guava, pineapple etc.This may be a major constraints both in India and foreign market and the Government of Mizoram has to reckon this factor before large scale plantations and investment processing.

It was recommended to the Government of Mizoram that the sale of finished products be first tied up and then all expansion programme both(plantation and Juice plants) be undertaken.It was also indicated that the pace of fruit to be procurred be fixed keeping in view the sale of the Juice in the market.This will not be Rs 5 per kg of fruit as is at present.At present an area of 4000 ha. has been proposed to be covered upto 2015 based on the current enthusiasm and keennes of the Government. It could be revived every three to five years depending upon the market trends on the concentrate of Juice.It was made clear that recommendation of 4000 ha. is subject to above conditions.

3. PEAR : In Mizoram,several households have pear trees in their compounds.Many people told that yield is as much as 500 kg.per tree.This seems to be on a very high side looking into the condition and spread of the trees which were neglected. However,some trees were in bad shape with optimum number of fruit bearing spurs. Pears are normally planted at 7 metres apart in the plains. In slope and topography of Mizoram these should preferably be planted at the spacing of five metres within a row and 7 metres between two rows.About 280 plants can be planted in one hectares.Besides, as a fruits.Pears can be converted into pear rings.The pears are cut into small

rings after removing the central core and dehydrated,can then be packaged in polybags.This is an attractive and delicious products.Pear juice, jam and sauce can also be prepared at home on commercial scale.This will take care of the mis-shaped and other low quality unmarketable fruits.

4. ALEURITE : Aleurite (Tung) is well suited to the Agro-climatic conditions prevailling in Mizoram.This is another crop which has great potential with high value low volume category of production.It was so far growing in forest/ uncultivated areas and it is only recently that it is receiving attention though on a minor scale.

Tung trees start bearing fruits (oil bearing nuts) in 3rd year if growth conditions are good.A six year old healthy plant yields about 25kg of dried seeds.Production per ha.may therefore be about 62.50 tonnes on the basis of 250 trees per ha. as some trees may die or be weak.The Regional Research Laboratory,Jorhat has found that the seeds from Mizoram has 32% high quality oil content.Total production of oil per ha. is expected to be about 20 tonnes.This seems to be a good yield.It is also known as candle nut trees and is used for this purpose

in house.Tung oil is used for wide range of purposes.Its marketing does not pose a major problem.Discussions Khadi and Village Industries Commission (KVIC) representative in Mizoram revealed that they see no problem in its marketing.They will be prepared to start procurement when production is available.MAMCO can also undertake procurement and oil extraction in Mizoram either itself or in colloboration with MIFCO which is taking up other processing facilities.Keeping in view the potential of crop several interested farmers have started planting this tree.

CHAPTER-VIII

CONCLUSION.

We have thus thoroughly studied the status, problems and prospects of horticulture in Mizoram. It is clear from our investigation and studies that this very sector should not be neglected as Mother Nature has generously bestowed with a soil suitable for most of the horticultural crops. So far the land use or even horticulture development has been taking place without proper planning and the desired technical back up. However, even without this, the area under horticulture has expanded rapidly with the people's initiative as well as the Government realising its profitability. It has come to a practical knowledge and experienced that fruits and vegetable crops have made some progress in the expansion of the industry and its importance has been realised day by day.

As far as horticulture problems are concerned it is strongly felt that the Government should take necessary steps in promoting the horticulture sector. There are many problems faced by this sector some of which are really formidable. One important factor to think about is research support. Research is the foundation and backbone of horticulture industry. Research back up and

technology base in Mizoram is inadequate and poor.Evidently the State does not have sufficient resources for such a strong support.The Indian Council of Agriculture Research Complex (ICAR) for Mizoram at Kolasib has done many good works in many aspects but still has a long way to go.

In the horticulture sector,the growers no doubt plays a vital role,but in the meantime they are facing a serious problems.It is not that they cannot produce in large quantities.What further accentuates the situation is that they face problem in marketing of their surplus produce sometimes.There are times when they have to go on distress sale and sold their produce at a throw away price.This lessened their desire to produce more.Therefore what is needed in this respect is to regulate the market.In nutshell,it may be reiterated that the horticulture sector in Mizoram is facing many problems on its way to development and if not look into the matter quickly can hamper its progress which may be fatal.

I suggest the following structures for development of horticulture in Mizoram :-

(1)Mizoram should be divided into various zones. Each zone should be instructed to cultivate a particular crop in accordance to the climatical conditions.The farmers in a particular area would have specialization in the method of cultivation,processing,grading etc.It would be also easy for the Government to give training to the growers,and took steps to assist them in every possible ways.

(2)In each zone,Co-operative Marketing Society should be formed.Each zone should have a Co-operative Marketing Society with an objective of service motive rather than profit motive.The society should aim at minimum profit margin just to meet management expenditure and interest payable.The Society would collect the produce from its members by making advance payments.The Society would take the produce to the nearest regulated market and sells at the best price at the best market.The Society would pay the farmer the balance amount due to him.It should also provides agricultural inputs like seeds, fertilizers,implements etd. for the benefit of its members. The Society would be able to advance loan to the farmers for their immediate requirements when the farmers wish to wait for better prices.

(3)The Society or Government should provide proper storage and warehousing facilities to avoid the damage of agriculture products by ants,rats,dampness etc.Proper grading facility be provided by the Society so that farmers may secure higher price.Proper weighing material should also be provided to check malpractice in weighing.

(4)Regulated markets should be set up in selected towns.The Government should establish Agriculture Produce Marketing Committee for each regulated market.Each regulated market be well-equipped with cold storage,processing unit,cheap handling system,banking,cheap and fast means of transport etc.Regulated market should provide close co-ordination and integration between finance,production and marketing the three vital wings of any business.

(5)Technical consultancy organisation should be established in association with the State Government.The organisation should take up marketing research in various lines of products and services.The Project Report prepared by the Organisation should recognised by highly educated local in the field.

(6)The transport cost should be established or fixed at a minimum cost.

It is thus necessary that the Government should take steps to achieve the desired results.This very sector has two fold importance in Mizoram,viz,as a soil conservation measures and as a measure of settling the Jhummies to enable them to abolish their wasteful shifting cultivation. The scheme did not attract much attention of the Mizo till the Sixties of this century.The hill men are most interested in their piggery or poultry farms than on the fruit bearing plants.The horticulture industry so far got a back seat in the agricultural bandwagon at the departmental and the Government of Mizoram policy level.

Fortunately,the Government realising the importance has recently created a new department of Horticulture on 7th June,1993(Govt. order No.A. 11017/1/93).This is a new turn and indicates the intention of the Government. For efficient working,the department is divided into four divisions,viz,Aizawl Division,Khawzawl Division,Tuidam Division and Lunglei Division.With various obstacles and problems to face the Government is trying its best to boost up horticulture by reclaiming lands,distributing seeds, insecticides and fertilizers,by popularising tree plantations such as oranges,banana,pineapple and other fruit

crops are being taken up intensively. Horticulture which was a neglected subject previously now has become a much talk about subject.It is practical knowledge that many horticultural farmers are benefitted and their income from the sale of their produce has risen considerably.With this objective in mind,the Government is taking all possible steps to encourage the growers so that in future this sector will be the backbone of the State economy.

ANNEXURE - I

Area, Production and Yield of Horticulture crops in the North Eastern States (1990-91)

A= Area in 000'ha P=Production in 000'tonnes Y=Yield in tonne/ha

STATE	FRUITS			VEGETABLES			SPICES		
	A	P	Y	A	P	Y	A	P	Y
Arunachal Pradesh	10.8	33.5	3.1	23.9	112.8	4.7	2.3	5.9	2.6
Assam	72.6	893.8	12.3	154.4	1612.5	10.4	39.9	144.4	3.6
Manipur	19.6	107.0	5.5	8.2	58.5	7.2	4.7	6.5	1.4
Meghalaya	31.4	190.5	6.1	33.7	208.5	6.2	15.2	45.8	3.0
Mizoram	7.4	33.8	4.5	3.9	38.9	10.0	3.6	9.9	2.7
Nagaland	2.9	7.1	2.5	8.4	76.7	9.2	0.3	1.2	4.2
Tripura	34.5	284.5	8.3	27.6	258.4	9.4	3.3	3.5	1.1

Source : Mizoram Integrated Development Project Report.

ANNEXURE - II

Area,Production and Yield of different fruits in Mizoram

A = Area in ha, P = Production in tonnes, Y = Yield in tonnes/ha

Year		Citrus	Banana	Pineapple	Mango	Papaya	Guava	Jack Fruit	Pear
1987 - 88	A	1,790	1,171	520	123	81	42	2	19
	P	7,299	7,784	2,388	4,000	304	107	11	2
	Y	4.8	6.65	4.59	35.52	3.75	2.55	5.50	0.11
	A	2,956	2,707	708	197	121	178	105	26
1989 - 90	P	10,576	14,905	4,790	825	697	397	1,183	88
	Y	3.58	5.51	6.77	4.19	5.75	2.23	11.27	3.38
	A	5,863	2,485	810	352	161	143	133	60
1992 - 93	P	24,180	9,399	4,189	1,506	1443	617	811	227
	Y	4.12	3.76	5.17	4.28	8.96	4.31	6.10	3.78

Source :-Agro-Horticulture Survey.

ANNEXURE - III

Area, Production and Yield of different vegetables in Mizoram

A = Area in ha. P = Production in tonnes. Y = Yield in tonnes/ha.

Year		Potato	Pumpkin	Squash	Local Mustard	Brinjal	Cucumber	French Mustard	Lady Finger	Bitter Gourd
	A	227	303	140	47	334	-	-	77	1,329
1987-88	P	982	883	2,100	96	2,114	-	-	58	6,051
	Y	4.33	2.91	15.0	2.04	6.35	-	-	0.75	4.55
	A	318	1,159	459	1,011	410	288	347	210	121
1989-90	P	2516	4,317	16,308	3,443	2,783	1,914	1,218	357	770
	Y	7.91	3.72	35.53	3.41	6.79	6.65	3.51	1.70	6.36
	A	458	1,078	581	576	529	415	242	225	202
1992-93	P	1068	5,083	24,728	2,664	2,210	2,523	1,188	280	1,016
	Y	2.33	4.72	42.56	4.63	4.18	6.08	4.91	1.24	5.03

ANNEXURE - IV

Area,Production and Yield of different Spices in Mizoram

A = Area in ha. P = Production in tonnes. Y = Yield in tonnes/ha

Year		Chillies	Ginger	Turmeric	Garlic	Others	All Spices
1987 - 88	A	2,481	1,244	49	-	203	3,977
	P	3,300	4,500	58	-	27	7,885
	Y	1.33	3.62	1.18	-	0.13	1.98
1989 - 90	A	2,293	1,763	62	5	-	4,123
	P	2,990	10,204	249	1	-	13,444
	Y	1.30	5.79	4.02	0.20	-	3.26
1992 - 93	A	2,875	782	149	51	2	3,859
	P	2,909	6,815	1,401	51	14	11,190
	Y	1.01	8.71	9.40	1.00	7.00	2.91

Source : Agro-Horticulture Survey.

ANNEXURE - V (A)

TRADE WISE ABSTRACT OF NLUP BENEFICIARIES

Year		94-95	94-95	91-92	91-92	90-91	90-91
S.No.	Trade	Lunglei R.D.Block	Khawzawl R.D. Block	Thingdawl R.D. Block	Zawlnuam	Reiek	W.Phaileng
1.	Orange	61	26	1208	960	439	-
2.	Hatkora	-	-	1013	667	101	-
3.	Assam Lemon	-	-	117	30	11	-
4.	Passion Fruit	11	433	1	-	-	-
5.	Sugarcane	62	20	279	22	9	-
6.	Banana	179	2	10	-	-	-
7.	Pineapple	8	2	-	49	10	-
8.	Tung(Aleurite)	91	1286	47	-	-	-
9.	Grape	-	12	-	-	-	-
10.	Jamir	-	6	-	-	-	-
11.	Mango	1	-	-	-	-	-
12.	Citronella	-	--	-	-	-	-
13.	Areca Palm	-	-	1008	437	-	-
14.	Coconut	-	-	20	45	-	-
15.	Tea	-	-	15	-	-	14
16.	Teak	-	-	2	76	-	-
17.	Coffee	-	-	-	-	-	4
18.	Sericulture	-	-	32	5	-	-
19.	Cardamom	-	-	-	-	-	-

ANNEXURE - V (B)

TRADE WISE ABSTRACT OF NLUP BENEFICIARIES

Year	93-94	93-94	93-94	90-91	
S.No. Trade	Mamit	Serchhip	Lungdar 'E'	Thingsul	
1. Orange	-	574	-	-	
2. Hatkora	-	26	1	-	
3. Assam Lemon	-	19	-	-	
4. Passion Fruit	-	55	12	-	
5. Sugarcane	-	-	-	641	
6. Banana	-	101	5	-	
7. Pineapple		383	9		
8. Tung(Aleurite)	53	481	364	690	
9. Grape	-	-	1	-	
10. Jamir	-	-	-	-	
11. Mango	-	11	1	-	
12. Citronella	-	18	-	-	
13. Areca Palm	-	-	-	-	
14. Coconut	-	-	-	-	
15. Tea	-	37	168	-	
16. Teak	-	-	-	4	
17. Coffee	-	2	2	-	
18. Sericulture	-	14	6	-	
19. Cardamom	-	39	-	-	

Source: Rural Development Survey Data.

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