

**MEGHALAYA
AGRICULTURE PROFILE
2006**

(THIRD EDITION)

**DEPARTMENT OF AGRICULTURE
MEGHALAYA**

PREFACE

Agricultural Development has made good progress in the State especially in the sphere of horticulture crops. At the same time, there is an increasing need to make available the current statistics, development strategy, approach and achievements in various sectors to researchers, farmers, development planners, educators and other interested member of the public.

The 2006 Revised Edition of the publication “Meghalaya Agriculture Profile” is a welcome step in providing the latest and up to-date information on agriculture development taking place in Meghalaya. This publication by the Department of Agriculture will provide users who are looking for facts and figures, statistics including relevant information pertaining to various development schemes provided by the department to the farming community in the State.

This publication is also an attempt by the Department to proactively make information available to the general public on the various plans and programme including achievements by various Directorates/Wings of the Department in the agriculture sector.

I congratulate the officers and staff of the Agriculture Information Wing for their dedicated and commendable work in putting together and compiling this publication.

Sd/-
Director of Agriculture
Meghalaya, Shillong

EDITORIAL

Agriculture in the State encompasses the whole gamut of myriad aspects such as input procurement, crop production technology, monitoring and evaluation, statistics, post harvest management and marketing etc not forgetting the risk involved due to uncontrollable factors of monsoon and nature. Surely a detailed compilation of the different aspects of Agriculture in the State would occupy a lot of space and volume. However, seeing the need of providing information about the Department, this Third Edition of “Meghalaya Agriculture Profile” is being brought out and aims at providing brief systematic information about the policies, programmes, achievements, developmental schemes etc of the Department. It is hoped that this booklet will serve as a guide towards knowing about the State’s Agriculture in general and the Department in particular.

The Agriculture Information Wing takes this opportunity to express its appreciation to all officers and others who have contributed towards compilation of this edition. The wing is grateful for their overwhelming response and their suggestions in the process.

The publication of this edition was possible because of the dedicated service of the officers and staff of the Agriculture Information Wing. Their selfless efforts in compilation, documentation, editing and finalisation deserve special mention.

The Publisher also wishes to invite suggestions and comments for the improvement of this Booklet in the subsequent edition in future.

Agriculture Information Officer
Directorate of Agriculture,
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CONTENTS

	<i>Page</i>
1. Introduction	6
2. Physical Features	7
3. Population	7
4. Climate and Rainfall	8
5. Soils	11
6. Land Use Pattern	11
7. Agrarian Structure	14
8. Developmental Strategy	14
9. Agricultural Production	15
9.1 Food grains	15
9.2 Oilseeds	18
9.3 Fibre Crops	20
10. Review of Plan Schemes	24
11. Strategy to improve Agricultural Productivity	27
12. Horticulture	31
12.1 Agro Climatic Zones	34
12.2 Major Horticultural Crops	34
13. Horticulture Production	35
13.1 Fruit Crops	35
13.2 Vegetables	38
13.3 Tuber Crops	40
13.4 Plantation Crops	42
13.5 Floriculture	43
13.6 Spices	44
13.7 Medicinal	44
13.8 Indigenous Plants	44
13.9 Mushroom	46
14. Fruit Processing	47
15. Strategy for Development of Horticulture	47
15.1 Technology Development and Transfer	47
15.2 Production of Input Services	48
15.3 Post Harvest Handling & Processing	49
15.4 Marketing & Export	49
15.5 Horticultural Farms & Nurseries	50
16. Common Strategy	51
16.1 Extension & Farmers' Training	51
16.2 Agricultural Engineering (Mechanical)	51
16.3 Agricultural Research	51
16.4 Minor Irrigation	52
16.5 Agricultural Marketing	53
16.6 Crop Insurance	53
16.7 National Watershed Development Programmes	54
17. Developmental Activities of the Department	54
18. State Plan Schemes under Horticulture	61
19. State Plan Schemes under Agriculture	62

LIST OF TABLES

	<i>Page</i>
I -District wise population	7
II -Population trend in Meghalaya	8
III -Rainfall Data	10
IV -Land Utilisation Statistics (2000 – 01)	13
V -Operational Holdings	14
VI -Demand of Food Grain in the State	16
VII -Food Grain Area, Production etc (1990-91 to 2000-01)	17
VIII - Area, Production & Yield of Oilseeds, Fibre Crops etc.	19
IX -Growth Rate of Important Crops (1990-91 to 2000-01)	21
X -Implications of the Ninth Plan Targets	23
XI -Position and Targets during the Ninth & Tenth Plan	25
XII -Estimated potential area for extension of Horticulture	33
XIII -Fruit Crops-Achievements (Ninth Plan) & Targets (2002-03)	35
XIV -Growth Rate of Fruit Crops (1990-91 to 2000-01)	37
XV -Growth Rate of Vegetable Crops (1990-91 to 2000-01)	37
XVI -Area, Production and Yield of Tuber Crops	39
XVII -Area, Production and Yield of Plantation Crops	41
XVIII -Area, Production and Yield of Spice Crops	45
XIX -Growth Rate of Spice Crops	46

STATE AGRICULTURE PROFILE

1. Introduction:-

Meghalaya emerged as a full-fledged state within the union of India on 21st Jan 1972. It is tucked in the North East of India, covering an area of 22489 sq. km. The State lies within 25*1' and 26*5' North latitudes and 85*49' and 92*52' East Longitudes. The temperature range is approximately 2 degree centigrade to 36 degree centigrade depending upon the altitude ranging between 300 mts above mean sea level (MSL) to 2000 mts above MSL. Meghalaya is amongst the highest rainfall areas in the world, predominantly mountainous, lying between the Brahmaputra valley in the North and the Surma valley (Bangladesh) in the South.

The economy of Meghalaya is basically agrarian as it is rural based with Agriculture playing a predominant role in the state's economy. Since, 70% of the state's population depends on Agriculture, employment and income generation also depends on Agricultural developmental activities to a great extent.

The State is yet to touch the National Level in economic and agricultural growth rate even after attaining full statehood more than thirty five years ago. The State is slowly and steadily progressing inspite of the numerous constraints and limiting factors. Practising of improved and modern methods of Agriculture by the farmers, using of Chemical fertilizers, Plant protection measures and introduction of High Yielding Variety (HYV) seeds of Paddy, Wheat, Maize etc has contributed to the increase in production of foodgrains. Mechanisation of Agriculture has gone up to some extent. Progressive farmers are able to produce more and in turn they supply seeds to the Department for distribution to small and marginal farmers. New crop interventions in agronomical practices and crops varieties introduced have started to show positive results.

Though, 70% of the population depends on agriculture, the net cropped area is only about 9.76 % of the total geographical area of the State. The state is deficit in foodgrains by 1.37 lakh tonnes annually to feed a population of 2.3 million (Table VI). This is due to a lot of constraints, such as the undulating topography, transport and communication problem, population dispersal pattern, inadequate credit

support, poor marketing system, etc. To overcome these hurdles, future programmes are proposed, like increasing agricultural/horticultural production and productivity, research system on the development of economically viable and location specific technologies in rainfed, flood-prone irrigated areas, and increasing the utilisation of irrigation potential etc.

2. Physical features: -

The total land area is 22,42,900 hectares. Forest covers about 9,47,786 hectares. The whole State is a hilly region; the rivers are perennial in nature with a large number of rapid streams and rivulets, joining the rivers. Meghalaya comes within the Eastern Himalayas Region (Zone II), which shaped the development in social, economic, and political and communication of the rural economy.

3. Population :-

**CENSUS 2001
As on 1st March 2001**

Total population - 23,06,069
Males - 11,67,840
Females - 11,38,229

Table – I DISTRICT WISE POPULATION

District	1991	2001	% Increased
East Khasi Hills	6,65,218	6,60,994	} 28.34
Ri Bhoi	-	1,92,795	
West Khasi Hills	2,20,157	2,94,115	33.59
Jaintia Hills	2,20,473	2,95,692	34.11
West Garo Hills	4,80,100	5,15,813	} 28.08
South Garo Hills	-	99,105	
East Garo Hills	1,88,830	2,47,555	31.09
TOTAL MEGHALAYA	17,74,778	23,06,069	29.93

Table – II Population trend in Meghalaya.

Year	Male	Female	Total	%Decadel Variation
1971	520967	490732	1011699	-
1981	683710	652109	1335819	+32.03
1991	907687	867091	1774778	+32.86
2001	1167840	1138229	2306069	+29.93
Agricultural Labour				
1971	25894	18237	44131	-
1981	34218	23681	57899	+31.19
1991	54604	41291	95895	+65.62
2000	-	-	132430	+38.09
Farm Labour				
1971	9094	3460	12554	-
1981	17920	7911	25831	+105.75
1991	N.A	N.A	45735	+77.05
Cultivators				
1971	176144	132834	308978	-
1981	210010	153000	363010	+17.48
1991	220251	184310	404561	+11.44
2000	N.A	N.A	427896	+15.76

The growth of population from 1971 – 1981, 1981 – 1991, 1991 – 2002 was 32.03%, 32.86% and 29.93% respectively. With respect to Agriculture labour the growth is 31.19% from 1971 – 1981, 65.62 % from 1981 – 1991 and 38.09 % from 1991 – 2000. Similarly Farm Labourers increased by 105.75 % from 1971 – 1981 and 77.05% from 1981 – 1991. (Table – II)

4. Climate and Rainfall:-

Meghalaya has a monsoon type of climate but with wide variation depending upon altitude and physiographic difference of landmass. While the Shillong plateau (600-2000m) has a bracing climate verging towards the temperate type, the lower regions adjoining the Surma and Brahmaputra Valley (100-300m) have a tropical climate.

The Agro-climatic Zones and Sub-Zones in the State is as follows:-

Sub-Region	Agro-climatic features	Soils	Dominant geographic units.
1	2	3	4
I	Humid and warm with an average rainfall between 1270-2032 mm	Light to medium texture, depth varying between deep to very deep	Hills and rolling and undulating pediment
II	Humid and hypothermic moderately cold in winter and warm in summer rainfall varying between 2800-4000mm	Light to medium texture depth varying from deep to very deep.	Upper and middle plateau.
III	Humid and moderately warm summer and severe winter rainfall between 2800-6000mm	Light to medium texture, depth varying from deep to very deep.	Upper and middle plateau
IV	Humid and warm high rainfall ranging from 4000-10,000mm	Light to medium texture, depth varying from deep to very deep.	Severely dissected and undulating low hills gentle to steep slope and rolling pediment.
V	Humid and hot, rainfall varying from 2800-4000mm	Light to heavy texture, depth varying from moderately deep to very deep.	Rolling and undulating pediment and valley land having depression.

Table III
Rainfall data

Year	Average amount of rainfall (mm)	Number of rainy days
1	2	3
1991	4824.70	134
1992	3638.30	108
1993	5276.20	125
1994	4016.80	117
1995	3280.70	108
1996	2302.03	108
1997	2461.19	118
1998	3693.59	115
1999	3799.04	129
2000	3749.76	137
2001	3359.73	119
2002	4092.35	135
2003	3011.45	136
2004	5657.30	132
2005	2510.90	129
2006	1895.05	120

Source: Statistical Cell Agriculture

Flood affected areas are mostly on the low altitude areas, bordering Assam and the international border (India-Bangladesh). Flash floods have become a regular feature in these areas, due to massive deforestation, unchecked jhum cultivation. The flood water carries huge amount of hill sand, stone, logs and trees, which are deposited in agricultural fields due to inundation of banks in the foot hills, thus causing immense damage to crops.

The key to the health of the farm sector in the state lies in the health of the forest cover in the state. Every peak, every square inch of the upper range of the hills need to be under mixed forest cover to protect the soil from leaching and erosion to help regulate and decrease the fury of streams and rivulets during the monsoon season. Vegetation also help to retain soil moisture and ooze it out during the lean winter months to balance vegetative stress caused by mono cropping in the valley; to bestow various other advantage which help maintain the fragile eco-balance. This will ensure continuous cultivation of crops in the farm sector.

5. Soil :-

The soils of the hills are derived from gneissic complex parent materials; they are dark brown to dark reddish-brown in colour, varying in depth from 50-200 cm. The texture of soils varies from loamy to fine loamy. The soils of the alluvial plains adjacent to the northwest and southern plateau are very deep, dark brown to reddish-brown in colour and sandy-loam to silty-clay in texture.

Meghalaya soils are rich in organic carbon, which is a measure of nitrogen supplying potential of the soil, deficient in available phosphorous and medium to low in available potassium. The reaction of the soils varies from acidic (pH 5.0 to 6.0) to strongly acidic (pH 4.5 to 5.0). Most of the soils occurring on higher altitudes under high rainfall belt are strongly acidic due to intense leaching. Base saturation of these soils is less than 35 %. These soils are not suitable for intensive crop production. There is not much difference in fertility classes of the soils of the State. Four soils fertility classes, namely, High Low Medium (HLM), High Medium Medium (HMM), Medium Medium Low (MML), Medium Low Medium (MLM) have been established from the soil test data so far compiled in the soil Testing Laboratory of the State.

Regarding micronutrient status, it has been observed that almost all the acid soils of the northeastern region of the country are deficient in available Boron (B) and Molybdenum (Mo). Acid soils of Meghalaya are rated low in available B and Mo. Total Zinc, Copper and Manganese contents of these soils vary from 10.00 to 17.25, 17.00 to 71.00 and 110 to 770 ppm (parts per million), respectively and DIPA (Diethylene Triamine Penta Acetic Acid) extractable zinc, copper and manganese contents of these soils ranges from 0.72 to 3.20, 0.6 to 2.8 and 3.0 to 162.0 ppm respectively. A study conducted by the Indian council of Agricultural Research (ICAR) Complex, Shillong revealed that about 40% of the soils of the state contain micronutrients below the critical level.

6. Land use pattern: -

Land use pattern is envisaged on land capability profile. Since land capability in the mountainous region is determined by the characteristics of micro and mini watersheds, land use pattern is therefore envisaged on the capabilities of each watershed and thus the potential of each watershed is thus envisage to be developed to yield sustainable land use.

a) Broadly the low lying areas were put under paddy during Kharif and with pulses, paddy, vegetables and oilseeds during the Rabi season depending on the availability of residual moisture and irrigation facilities.

b) Gentle slopes up to 20% were put under other crops like wheat, paddy, maize, pulses, oilseeds, vegetables etc, which not only contribute towards food security but also yield substantial revenue returns per unit of land and labour. On such slopes the concept of watershed management of land and water is encouraged.

c) Horticulture is taken up on slopes above 20% and Border Areas, which are traditional horticultural areas, received special attention.

d) Forest cover in the State (41.98%) is below the national norm of 60% recommended for hilly areas. This is because a sizable proportion of the Forest area is reportedly under shifting cultivation resulting in depletion of the Forest Cover. A very meager proportion of the geographical area (9.75%) is net sown area, including area under shifting cultivation. The potential net sown area could be increased if and when the fallow lands are utilised for cultivation purposes. The cultivable waste land of the state is 20.11% of the geographical area a part of which might be progressively utilised for cultivation purpose in the long run. The cropping intensity of the state is 121%.

Table - IV**LAND UTILISATION STATISTICS: MEGHALAYA 2004-05** (Area in Hectares)

Sl No	District	Report- ing Area	Forest	Not Available for cultivation		Other uncultivated lands excluding fallow lands			Fallow Lands		Net Sown Area	Area sown more than once	Total crop- ped area.
				Area under non agril uses	Barren & un- cultiv- able area	Per- ma- nent Pas- tur- es & oth- er graz- ing land	Land Under misc tree crops & groves	Cul- tiva- ble waste land	Fallow land other then cur- -rent fallow	Cur- rent fallow land			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Ri Bhoi	243700	86750	13805	20565	-	28780	58446	9860	6275	19219	2475	21694
2	East Khasi Hills	272200	104468	13873	36748	-	17119	57409	6501	4744	31338	7742	39080
3	West Khasi Hills	517100	207960	21417	49020	-	42423	109674	47694	18280	20632	5754	26386
4	Jaintia H.	381100	154150	17089	13868	-	17058	120045	17682	11058	30150	365	30515
5	East Garo Hills	259300	122562	5570	4800	-	20312	47773	22220	5015	31048	5327	36375
6	West Garo Hills	36900	164001	14296	7432	-	24302	34681	43113	12300	69475	20279	89754
7	South Garo Hills.	184100	101895	4165	5297	-	6625	23070	20243	5775	17030	4738	21768
	Total Meghalaya	2227100	941786	90215	137730	-	156619	451098	167313	63447	218892	46680	265572

7. Agrarian structure:-

a) Land Holding:

Land Holdings in Meghalaya mean operational holdings, as there is little concept of ownership under traditional land system. The pattern of operational holdings in the state is characterised by the predominance of small and marginal farmers (below 2 ha) who operate 65% of the cropped area are with medium and other landowners.

Table – V

Number of Operational Holdings and Area Operated (Census 2001)

(Number in '000 & Area in '000 Ha)

Sr No	Size Class	Numbers	Area	% of Holdings		Avg Size per holding (Ha)
				Number	Area	
1	2	3	4	5	6	7
1	Marginal (0.05 – 1.00 ha)	114	63	53.27	22.66	0.55
2	Small (1.00 – 2.00 ha)	57	83	26.64	29.86	1.45
3	Semi Med (2 – 4 ha)	36	91	16.82	32.73	2.58
4	Medium(4 – 10 Ha)	7	36	3.27	12.95	5.41
5	Large (above 10 ha)	Negligible	5	0.00	1.80	13.12
	Total	214	278			1.30

Negligible i.e. less than 500 units/hectare

b) **Brief analysis on land holding pattern:-** As directed by the Government of India, Agriculture census in the state has been conducted. One of the items of this census is the land holding pattern. Information on Area and number of operational holdings by different size groups viz. marginal, small, semi-medium, medium and large holdings are as given at above. (Table – V)

8. Development of Strategy:-

Since the net sown area is estimated at 218892 hectares (2004-05) which is 9.82 % of the Reporting area and since the given physiography of the state does not permit a significant increase in net cropped area, therefore:

a) The main thrust shall be on Horticultural growth where the potential for expansion is large and the net revenue per hectare tends to be higher than the field crops.

b) Thrust will be laid on increasing farm productivity in all sectors with special emphasis on sectors like Food grains, Oilseeds and Pulses by intensifying extension activities.

c) Increase in area under Multiple Cropping shall be facilitated by introduction of new technology such as:

i) Field crops particularly vegetables which are envisaged to be grown under permanent/semi-permanent poly-houses to at least double the productivity over the current level.

ii) Extension of sprinkler and drip irrigation and

iii) Intensive watershed management both macro and micro for sustainable production and preservation of natural resources.

9. AGRICULTURE PRODUCTION

9.1 Food grains: -

Food grains constitute the main food items of the entire population. Hence, food grains production in the State requires top priority attention, so as to reach nearer to self-sufficiency in the near future and to catch up with the food grain requirement of the growing population.

The following steps have been initiated to strengthen this sector:

a) Dissemination of modern technology applicable to small holdings in hilly terrain.

b) Conversion of jhum land into permanently cultivatable tracts.

c) Increasing area under high yielding varieties (HYV) of rice, wheat, maize, oilseeds pulses and millets having resistance to diseases and pests.

d) Increasing double cropped area through multiple cropping.

e) Adoption of short duration HYV seeds of rice to fit into the double/multiple cropping cycle.

f) Popularisation of Fertilizers, HYV seeds and need based plant protection measures and integrated pest management.

g) Making available more number of power tillers, power pumps and sprayers to farmers at subsidised rates.

h) Dissemination of post harvest technology to minimise post harvest losses through pest and diseases.

Table -VI

**Demand of foodgrain in the State
(Based on population census 2001).**

Year	Population (in lakhs)	Demand of foodgrain (lakh tonnes)	Foodgrain production (lakh tonnes)	Shortfall (lakh tonnes)	Remarks
2000-01	23.06	3.37	2.15	1.22	
2001-02	23.59	3.44	2.24	1.20	
2002-03	24.12	3.52	2.26	1.26	
2003-04	24.65	3.60	2.33	1.27	
2004-05	25.18	3.68	2.24	1.44	
2005-06	25.71	3.75	2.38	1.37	
2006-07	26.24	3.83	2.31	1.52	
2007-08	26.77	3.91	3.24	0.67	Estimated
2008-09	27.30	3.99	3.36	0.63	Estimated
2009-2010	27.83	4.06	3.48	0.58	Estimated

TABLE – VII
FOODGRAIN AREA PRODUCTION AND PRODUCTIVITY (1990-91 TO 2006-07)

Year	Rice			Wheat			Maize			Other Cereals			Pulses			Total Food grains		
	Area '000 Ha	Prdn '000 MT	Prdy kg/ha	Area '000 Ha	Prdn '000 MT	Prdy kg/ha	Area '000 Ha	Prdn '000 MT	Prdy kg/ha	Area '000 Ha	Prdn '000 MT	Prdy kg/ha	Area '000 Ha	Prdn '000 MT	Prdy kg/ha	Area '000 Ha	Prdn '000 MT	Prdy kg/ha
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
90-91	104.37	119.08	1141	421	5.56	1318	18.55	23.82	1284	2.96	2.51	846	3.20	2.41	753	133.30	153.36	1151
91-92	104.50	121.07	1158	4.21	5.55	1320	18.49	23.74	1284	2.96	2.46	831	3.18	2.38	750	133.34	155.20	1164
92-93	104.50	114.04	1095	4.21	6.17	1467	17.08	20.18	1181	2.97	2.42	816	3.19	2.40	752	131.59	145.20	1103
93-94	104.41	117.79	1128	4.21	6.64	1577	16.97	20.09	1184	2.97	2.42	815	3.20	2.40	750	131.79	149.35	1133
94-95	103.20	111.49	1080	4.22	6.36	1507	16.87	20.55	1218	2.80	2.42	800	3.18	2.39	752	130.40	143.03	1097
95-96	104.05	111.78	1074	4.22	4.71	1116	16.96	21.75	1218	2.82	2.22	787	3.18	2.42	761	131.23	142.88	1089
96-97	104.79	141.11	1347	4.31	6.91	1603	17.04	25.56	1500	2.81	2.23	794	3.22	2.47	767	132.17	178.28	1349
97-98	105.17	150.10	1427	4.29	6.89	1606	17.18	24.88	1448	2.80	2.24	800	3.22	2.46	764	132.65	186.57	1406
98-99	105.40	149.73	1421	4.29	7.00	1632	17.22	25.27	1468	2.82	2.28	808	3.26	2.49	764	132.99	186.78	1404
99-00	106.40	171.079	1643	4.28	6.99	1633	16.63	24.05	1446	2.83	2.29	809	3.29	2.47	751	133.46	210.59	1578
00-01	106.60	179.04	1680	4.21	6.89	1636	16.91	24.25	1434	2.80	2.27	809	3.37	2.54	752	133.89	214.99	1606
01-02	107.76	188.97	1754	2.75	4.81	1747	16.86	25.24	1497	2.72	2.15	791	3.38	2.54	752	133.48	223.72	1676
02-03	107.74	190.93	1772	2.71	4.74	1748	16.92	25.87	1529	2.76	2.31	837	3.37	2.54	756	133.51	226.42	1696
03-04	109.72	200.70	1829	0.86	1.54	1787	16.90	25.92	1534	2.66	2.20	830	3.42	2.60	761	133.56	232.98	1744
04-05	111.55	193.71	1737	0.86	1.56	1812	16.87	24.00	1422	2.65	2.24	845	3.42	2.62	765	135.36	224.14	1656
05-06	106.07	208.27	1964	0.67	1.19	1788	16.89	24.42	1445	2.67	2.27	851	3.49	2.67	765	129.79	238.84	1840

(a) Rice:- Among the foodgrain, Rice was the main crop and it occupied about 82.40% of the area and 86.42% of the production under foodgrain. About 76.0 thousand hectares (40.50%) of the total area under rice were estimated to be under H.Y.V. The objectives of introducing H.Y.V Seeds is to boost the total rice production to meet/augment the shortfall of foodgrains of 1.37 lakh tones.

(b) Maize:- The second most important foodgrains crop in the state is Maize which covered an area of about 16.87 thousand hectares with a total production of about 24.00 thousand M.T during 2004-05. It is estimated that about 80% of the area under Maize was under high yielding varieties.

(c) Wheat:- The area under wheat have considerably dropped. It now occupies an area of only about 863 Ha with a production of 1.56 thousand M.T in 2004-05.

(d) Pulses:- Pulses occupied a smaller share in the area and production under foodgrain. Among the Pulses, Cowpea, Pea, Lentil, Arhar, Black Gram, Bengal gram, Rajma grown in the area during 2004-05. The area and production of pulses in the State were 3426 ha and 2622 M.T respectively. (Table – VII)

9.2 Oilseeds:-In the oilseed sector, the following crops are considered within the ambit of Crop Forecast data. These are Castor, Sesamum, Rape & Mustard, Linseed and Soyabean. Sunflower has also been introduced but has not been included within the crop Forecast data. During 2004 – 05, the total Area and Production of oilseeds is 9924 ha and 6647 Mt respectively. The most important among the oilseed crops is Rape and Mustard, which accounts for 7222 ha in Area and 4797 Mt in production. The bulk of production of Rape and Mustard is in Garo Hills, which constitute up to 95.5% and 96.24% of the Area and Production under this oilseed respectively. Out of the total area of 967 ha under Soyabean, the districts of Ri Bhoi, East and West Khasi Hills and Jaintia Hills accounts for 735 ha.

Table - VIII
TOTAL AREA, PRODUCTION & YIELD OF OILSEEDS, FIBRE CROPS & OTHER CROPS

AREA - HECTARES
PRODUCTION - METRIC TONNES
YIELD - KG/HECTARE

Year	Oilseeds (Castor, Sesamum, Rape & Mustard, Soyabean, linseed)			Fibre crops (Cotton, jute, mesta)			Other crops (Sugarcane, Tobacco)		
	Area	Prod	A.Y	Area	Prod	A.Y	Area	Prod	A.Y
1990-91	8919	5637	632	17109	66143	2356	794	704	3566
1991-92	8936	5544	620	17535	70395	2447	832	745	3596
1992-93	8926	4178	468	17603	60382	1887	842	744	3287
1993-94	9019	5590	620	12704	60661	2338	845	754	3385
1994-95	9056	5783	839	16454	62011	2438	835	728	3313
1995-96	9108	6448	708	16493	54149	1904	818	741	3383
1996-97	9204	5987	650	16479	56879	2224	829	729	3363
1997-98	9218	6006	652	16475	61831	2425	824	730	3425
1998-99	9219	6120	664	16471	54058	2079	825	732	3394
1999-00	9464	6293	665	16147	59870	2344	800	713	3435
2000-01	9503	6374	671	16195	64858	2533	786	707	3427
2001-02	9559	6459	676	4550	24526	970	811	706	2382
2002-03	9927	6535	658	4513	20599	822	799	689	3392
2003-04	9918	6505	656	4502	20459	818	806	700	3400
2004-05	9924	6647	670	4195	19018	816	813	709	3395
2005-06	9975	6692	671	4436	20212	820	801	694	3397

N.B:- Cotton in bales of 170 kgs each, Jute & Mesta in bales of 180 kgs each.

The scope for expansion of area under oilseed is truly large. It is expected that with a concerted thrust given to Double and Multiple Cropping strategy the cultivation of oilseed crop would snowball into an established agricultural practice in the state.

9.3 Fibre Crops:- There are three fibre crops in the state namely; Cotton, Mesta and Jute grown exclusively in the districts of Garo Hills. These crops have been the traditional cash crops of Garo Hills. Fitting the trend line to the data of sixteen years period (1990-91 to 2005-06) there is a qualitative and quantitative change in the cultivation of all these crops. (Table – VIII)

Except for Cotton the trend line indicates a progressive decrease of area, production and productivity of the other fibre crops. The stagnated and decreasing yield of fibre Crops, in particular, Jute and Mesta may be due to a number of reasons, the major one being the un-remunerative price farmer received for these crops.

Table - IX
**ANNUAL AVERAGE AND COMPUTED ANNUAL GROWTH RATE OF SOME IMPORTANT
CROPS IN MEGHALAYA DURING THE PERIOD 2000-2001 to 2004-05**

SI No	Name of Crop	Annual average between			Average annual growth rate			% of Average growth rate		
		Area (ha)	Prodn (tons)	Yield Kg/ha	Area (ha)	Prodn (tons)	Yield Kg/ha	Area %	Prodn %	Yield %
1	2	3	4	5	6	7	8	9	10	11
1	Rice	108674.80	190674.40	1754.40	1186.00	4108.40	18.90	1.90	2.15	1.08
2	Wheat	2281.60	3911.00	1746.00	-859.50	-1393.00	39.20	-37.67	-35.62	2.25
3	Maize	16893.80	25061.00	1483.20	-2.08	18.20	1.30	-0.02	0.07	0.09
4	Pulses	3394.20	2570.40	757.20	14.40	23.00	3.50	0.42	0.89	0.46
5	Other cereals	2719.00	2236.20	822.40	-35.50	0.70	11.10	-1.31	0.03	1.35
6	Total Foodgrain	133963.40	224453.00	1675.60	302.60	2757.30	16.80	0.23	1.23	1.00
7	Oilseeds	9766.20	6504.20	666.20	120.10	59.20	-2.20	1.23	0.91	-0.33
8	Cotton	7297.00	7788.60	181.60	-26.00	8.10	0.90	-0.36	0.10	0.50
9	Jute	4083.40	30510.20	1342.80	-42.00	-2068.40	-77.20	-1.03	-6.78	-5.75
10	Mesta	4479.00	21192.00	851.00	-92.80	-874.70	-17.80	-2.07	-4.13	-2.09

Cotton :- Production in bale of 170 kg. each

Jute & Mesta:- Production in bale of 180 kg. each.

(Source: Statistical Cell, Agriculture)

From Table-IX, the growth rate during the last five years indicated a positive rise by +1.23% in food grain production. The department have been trying to meet the requirement in the foodgrain production and special attention is envisaged on the production of rice, being the main crop in the foodgrain sector in the state. It occupies 82.40% of the area and 86.42% of the production under food grains. In 1998-99 42,700 hectares (40.50%) out of the total area under rice was estimated to be under HYV. During 2000-2001 the area increase to 65,000, this is 61% of the total area. At the end of the Tenth Plan period area achieved under HYV is 76.0 thousand hectares. The objective of introducing HYV seeds is to boost the total rice production to 1.37 lakh tonnes.

During the last five years, the scenario in the foodgrain sector, indicated an increasing trend though marginal. The average annual growth rate during the years 2000-01 to 2004-05 is as follows: -

Area	-	+0.23%
Production	-	+1.23%
Productivity	-	+1.00%

The indication above shows that, area, production and productivity has increased by 0.23%, 1.23% and 1.00% respectively.

Table - X
PHYSICAL TARGETS & ACHIEVEMENTS
DURING THE 9th & 10th PLAN (2002-07) & 11th PLAN (2007-12)

Items	Units	9 th Plan Achievement (1997-2002)	10 th Plan Target (2002-07)	10 th Pal Achievement (2002-07)	11 th Plan Target (2007- 2012)	Target/Anti Achievement during (2007-08)	Target for 2008-09
1	2	3	4	5	6	7	8
Foodgrains	'000 tonnes	214.00	273.61	248.40	379.00	291.00	336.00
Oilseeds	'000 tonnes	6.34	14.53	11.19	26.18	22.17	19.67
Tuber Crops	'000 tonnes	144.29	199.92	199.92	246.69	225.10	230.49
Fruit Crops	'000 tonnes	222.70	234.33	234.33	291.98	288.64	289.47
Spice Crops	'000 tonnes	71.13	58.23	58.23	95.78	68.31	156.51
Plantation Crops	'000 tonnes	21.21	23.01	23.01	32.29	33.83	164.82

10. Review of Plan Programme: -

On the basis of the analysis of the factors influencing the agricultural scenario in the State, the Department of Agriculture has floated Schemes which attempt to optimise farm output of such crops which not only contribute towards the strengthening of the food grains sector but also optimise revenue returns per unit of factor input. This is a significant policy shift. Previously the department was aiming towards food grains self sufficiency only; the new policy however takes cognisance of agro climatic capabilities of the five different agro climatic sub zones to determine the cropping pattern in each zone. This policy shifts our attention from food grains to horticultural crops in which our comparative advantages are strong. For example, in the Eight Five Year Plan we have sought external aid to strengthen the Mushroom and Fruit Processing sectors along with the agricultural marketing structure. In the Ninth Plan period the department have made a major policy shift wherein there was introduction of intensive rice production through Boro Paddy cultivation in areas where water is available either through residual moisture or irrigation, focus on crops of low volume but possessing high market value coupled with post harvest value addition of produce. It may be stated that the new policy shift attempts to commercialise the agricultural sector and lift it out of the syndrome of subsistence agriculture and therefore makes it incumbent upon the department to strengthen the marketing wing to ensure speedy disposal of agricultural produce at fair prices to farmers through a network of regulated markets.

The volume of production of items like mushroom, fruits and vegetables etc and their prices would greatly depend upon the vigour of the Marketing Wing/Board of the department to tap domestic and international markets.

Table – XI
Position during the Tenth Five Year Plan (2002-2007)
Target During the Eleventh Five Year Plan (2007-2012)

Agriculture Sector

Sr No	Item	Units	9 th Plan Achievement	Tenth Five Year Plan (2002-07)		Eleventh Five Year Plan (2007-2012)		Remarks
				10 th Plan Target (2002-07)	10 th Plan Achievement (2002-07)	11 th Plan Target (2007-2012)	Target/Anti. Achievement during (2007-2008)	
1	2	3	4	5	6	7	8	10
1	Foodgrains							
	Rice	'000 MT		190.00	188.90	342	257.55	
	Wheat	'000 MT		13.61	9.10	1.65	1.60	
	Maize	'000 MT		53.00	36.00	28.50	26.50	
	Other Cereals	'000 MT		6.00	4.20	2.55	2.35	
	Pulses	'000 MT		11.00	6.20	4.00	3.00	
	Total Foodgrains	'000 MT	214.96	273.61	248.40	379.00	291.00	
2.	Oilseeds							
	Rape & Mustard	'000 MT		8.50	6.20	13.35	10.55	
	Sesamum	'000 MT		1.10	0.97	3.60	2.95	
	Soybean	'000 MT		1.80	1.55	2.42	1.92	
	Castor	'000 MT		0.03	0.02	0.02	0.02	
	Sunflower	'000 MT		0.80	0.65	1.07	1.03	
	Groundnut	'000 MT		2.30	1.80	5.72	5.70	
	Total Oilseeds	'000 MT	6.34	14.53	11.19	26.18	22.17	
3	Cotton	'000 bales		10.00	8.60	16.00	16.00	
	Jute & Mesta	'000 bales		72.00	62.50	85.00	78.00	
4	High Yielding Varieties (HYV)							
	Rice	'000 Ha		109.50	76.00	120.50	112.50	
	Wheat	'000 Ha		8.40	5.00	10.50	8.50	
	Maize	'000 Ha		34.83	22.00	40.00	35.00	

Horticulture Sector

Sr No	Item	Units	9 th Plan Achievement	Tenth Five Year Plan (2002-07)		Eleventh Five Year Plan (2007-2012)		Remarks
				10 th Plan Target (2002-07)	10 th Plan Achievement (2002-07)	11 th Plan Target (2007-2012)	Target/Anti. Achievement (2007-2008)	
1	2	3	4	5	6	7	8	10
1	Fruit Crops							
	Pineapple	'000 MT		85.00	85.00	90.40	90.04	
	Citrus Fruits	'000 MT		34.73	34.73	46.28	42.81	
	Banana	'000 MT		66.41	66.41	82.08	83.25	
	Papaya	'000 MT		6.10	6.10	10.09	10.31	
	Temperate fruits	'000 MT		5.33	5.33	7.05	10.42	
	Misc Fruits	'000 MT		36.76	36.76	50.04	45.92	
	Strawberry	'000 MT		-	-	6.04	5.89	
	Total Fruits	'000 MT	222.70	234.33	234.33	291.98	288.64	
2.	Vegetables	'000 MT		145.49	145.49	17.02	152.64	
3.	Tuber Crops							
	Potato	'000 MT		157.58	157.58	192.19	172.01	
	Sweet Potato	'000 MT		19.02	19.02	25.35	25.04	

	Tapioca	'000 MT		23.32	23.32	29.15	28.05	
	Total Tuber Crops	'000 MT	144.29	199.92	199.92	246.69	225.10	
4.	Spice Crops							
	Ginger	'000 MT		46.81	46.81	60.54	50.24	
	Turmeric	'000 MT		9.62	9.62	15.05	12.75	
	Chillies	'000 MT		1.26	1.26	18.07	3.14	
	Black Pepper	'000 MT		0.54	0.54	2.12	2.18	
	Total Spice Crops	'000 MT	71.13	58.23	58.23	95.78	68.31	
5	Plantation Crops							
	Tea	'000 MT		1.84	1.84	5.60	5.70	
	Arecanut	'000 MT		14.77	14.77	18.24	19.05	
	Cashewnut	'000 MT		6.40	6.40	8.45	9.08	
	Total Plantation Crops	'000 MT	21.21	23.01	23.01	32.29	33.83	

Others

Sr No	Item	Units	9 th Plan Achievement	Tenth Five Year Plan (2002-07)		Eleventh Five Year Plan (2007-2012)		Remarks
				10 th Plan Target (2002-07)	10 th Plan Achievement (2002-07)	11 th Plan Target (2007-2012)	Target/Anti. Achievement during (2007-2008)	
1	2	3	4	5	6	7	8	10
1	Chemical Fertilizers							
	Nitrogenous (N)	MT		7.20	3.80	8.50	7.00	
	Phosphatic (P)	MT		4.50	2.43	6	4.75	
	Potassic (K)	MT		1.50	0.26	2.50	1.75	
2.	Crop Area							
	Net Area	'000 Ha	210.46	257.80	219.00	265	225.00	
	Area sown more than once	'000 Ha	46.66	62.45	46.60	65.00	50.00	
	Gross Area	'000 Ha	257.12	320.25	265.60	330.00	275.00	
3.	Area covered under Irrigation	'000 Ha	24.52	27.00	27.00	57.37	30.00	

11. Strategy to improve productivity in Agriculture Sector: -

In view of the limitation in increasing significantly the net area sown, particularly under food grains, because of the given situation of topography and agro-climate, the state is now giving more emphasis on improving the productivity of crops by adopting the following strategies:-

1. Multiple cropping is to be given much more emphasis to increase cropping intensity with all packages of practices of crop production.
2. Judicious application of agricultural inputs like seeds, fertilizers, plant protection chemicals, etc. for increased crop production and productivity.
3. Use of right type of seeds for right type of soils and climatic condition.
4. Ensure timely delivery of agricultural inputs, such as seeds, fertilizers, etc to the farmers.
5. Timely sowing of seeds and transplantation of seedlings, i.e. seasonality of crop cultivation is to be maintained.
6. Where high yielding varieties (HYV) of crops are suitable, the improved and traditional varieties should be gradually are replaced by HYVs.
7. Ensure supply of water to the crops from the irrigation projects at the time of need and their management.
8. Ensure availability of agricultural machinery to the needy farmers at concessional rate on hire.
9. Encourage farmers to go for rabi crops cultivation in an extensive scale as the winter rains and also the residual moisture in the valley bottom land in the winter season tends to stay much longer than in other states like U.P., Bihar, Rajasthan etc.
10. Land development to be taken up to remove siltation due to flash flood to maintain the quality of crop yield.
11. Widespread and frequent campaigns through leaflets, radio, TV explaining the advantages of Kharif and Rabi cultivation of crops are to be conducted in local languages.
12. Farmers study tours are to be conducted to create awareness of better crop production in a scientific method.

11.1 Thrust Areas for the Eleventh plan period (Agriculture Sector):

- **Cluster Approach** - A restructuring of policies and institutions would inevitably accompany the radical transformation. The cultivated area of the State would be divided into crop-wise

clusters. Each cluster would be defined as a Crop Development & Marketing Unit (CDMU) , stressing not only the supply facet, but, more importantly , the demand side of the cluster and would ideally be under the charge of a Departmental Officer.

- **Focus Crops** - Instead of cultivation of a plethora of crops, in small quantities, concentration would be on a few *Focus Crops* to keep their alternative avenues of income intact . During the 11th Plan, however, the strategy would be to focus on some of some of the traditional crops namely rice, *kharif* maize, soybean and mustard which have been doing consistently well and to expand area under promising crops, like *rabi* maize, soyabean and *boro* (spring) paddy.
- **Food grains** - Meghalaya aims to achieve the target of 3.79 lakhs MT by the end of the 11th Plan period through concerted efforts of increasing productivity of local varieties, shift toward HYV and Hybrid paddy, double cropping with spring paddy, land reclamation and supplemented by increased in area and production of maize (ideal for Meghalaya conditions). In order to boost rice production, effort will be taken to cover 20,000 ha each year in 200 clusters of 100 ha each for which and additional of Rs. 8.00 crores would be required amounting to Rs. 40.00 crores for the 11th Plan period. This would be achieved through land reclamation to add fresh areas under paddy and increasing crop intensity with *Boro* (spring) paddy in existing rice area.
- **Seed Certification** - The availability of quality seeds is crucial if the productivity is to be raised and hence Seed Certification is another area to be undertaken within the plan period so that farmers are supplied with certified seeds for productive cultivation. While the Department is grateful to the Assam Seed Certifying Agency (ASCA), for its help in certifying seeds particularly rice and maize, this is not always a convenient arrangement, for obvious reasons. Hence, one of the targets is the establishment of the Meghalaya Seed Certifying Agency (MeSCA) to cater to this vital requirement.
- **Organic Farming** –The consumption of chemicals fertilizers in the State is very low being only 18 kgs/ha as compared to the national average of above 94kgs/ha. The total consumption of fertilizers in the state is concentrated mainly in potato and vegetables and to some extent paddy crop in mid and low altitude

areas. There are still villages in the state where chemical fertilizers are still unknown and that crops are being grown organically with organic manures as the only source of plant nutrient. Keeping this in mind there is a very good scope of encouraging farmers to continue with this farming system in order to take advantage of the increasing demand and higher prices of organically grown crops. To give more impetus to organic farming in the State the Department proposes:

a) To organize mass awareness programmes through training on the correct steps of organic farming approaches like selection of organically grown seeds, soil amendments through organic manures/bio fertilizers and plant protection measures through bio pesticides/bio agents etc.

b) A model organic farm on 2 hectares of land is proposed to be set up with the required conversion norms for certified organic farming and to identify service providers one each for the project areas at Tura Headquarter in the West Garo Hills District, Jowai Headquarter in the Jaintia Hills District and the East Khasi Hills District.

c) To promote organic farming through use of bio fertilizers and organic manures in suitable combination which will not only maintain higher productivity but also sustain soil fertility and give impetus to the use of vermin culture through training programmes on organic farming.

d) Key agriculture and horticulture crops have been identified for organic production/conversion like local rice, cashewnut, pineapple, ginger, turmeric etc.

- **Capacity Building** - Modern capacity building entities are key hubs for skill development both for farmers and Departmental personnel; hence up-gradation of departmental training centers on the lines of some of the leading training and consultancy institutions of the country is vital. Systematic programmes are needed to be conducted for both officials and farmers in various subject areas especially in new technologies like Hi Tech Agriculture, Green House Management, Soil-less horticulture, Risk Management, Integrated Marketing and Value Chain Creation, Organic Certification, Phytosanitary Protocols, WTO Concepts, Modern Extension Reforms, Application of Information technology, Food Quality Standards etc.

- **Agricultural Mechanization** - The present available power on agricultural mechanization in the State is only 0.0345 hp per hectare against the all India level of 1 hp per hectare, priority will therefore be given to the promotion of agricultural mechanization in order to boost agricultural production and to stress on timely sowing and planting. The Department will continue to implement the Central Schemes of farmers Agro-service Centres, Agricultural machinery, Training & Evaluation Centres and popularisation of Improved Agricultural Equipments alongside the State Plan Schemes of Mechanical Engineering Workshop and supply of power tillers, power threshers, power reapers, etc. with the level of subsidy to be raised.
- **Watershed Development** - The watershed projects under the existing national Watershed Development Project for Rainfed Areas (NWDPR), are integral to sustainable agriculture development and livelihood improvement due to multi dimensional activities which focouses on the specific needs of the watershed areas and their agro-ecological situation which no doubt is a laudable concept for holistic and integrated development. The implementation of the programmes is through hundred percent fund releases by the Govt of India through the Centrally Sponsored Schemes of Macro Management of Agriculture on the basis of the work-plan proposed by the Department, annually with a projected target for each plan period.
- **Rashtriya Krishi Vikas Yojana (RKVY)** – The National Development Council resolved to introduce an additional central assistance scheme called RKVY that incentivizes States to increase public investment in agriculture and allied sectors. The key end goal is to achieve at least 4.1 percent growth in Agriculture by the end of the 11th Five Year Plan. The objectives of RKVY are:
 - i) to incentivize the States to increase their investment in Agriculture and allied sectors, ii) to provide flexibility and autonomy to the States in planning and executing programmes for Agriculture, iii) to ensure the preparation of agriculture plan for the districts and the States, iv) to achieve the goal of reducing the yield gaps in important crops, v) to maximize returns to the

farmers, vi) to address the agriculture and allied sectors in an integrated manner

The first State Level Sanctioning Committee (SLSC)(17/12/07) in the presence of the representatives from the Ministry of Agriculture and the Planning Commission has approved the following programmes under Agriculture and Horticulture Sectors.

a) Under the Agriculture sector, the thrust is on area expansion of Boro Paddy (Winter Crop) given the fact that this has the potential to provide for yields of 3-4 metric tones per hectare, in comparison with 1.5 – 2.0 metric tones realized through Sali Paddy (summer crop). The area expansion necessarily supported by irrigation has the potential to substantially increase productivity, production and farmer's income. Potential areas for Boro Paddy could be cultivated primarily due to the absence of assured irrigation in the dry season. As such, under RKVY, the micro irrigation intervention like rain water harvesting, flexible sausage dams, shallow tube wells and surface water pumping.

b) Under the Horticulture Sector, the thrust encompasses area expansion of new crops under C2C (Concept to Completion) mode, post harvest and pre market interventions for traditional crops and new initiatives for organic certification for a few selected crops. The SLSC has approved the Programmes for area expansion for coloured capsicums and Roses, turmeric processing units, two unit Reefer Vans of 6 MT capacity, 2 units pre-coolers of 6 MT capacity and organic certification for 5 crops.

12. HORTICULTURE:

General Background

In mountainous region, in general land utilisation under Horticultural crops tends to yield the highest level of both social and Economic benefits and therefore the thrust of the Department is to develop horticulture to achieve the twin objectives of maximising social and economic benefits.

The geo-climatic situation of Meghalaya offers an excellent scope for growing of different types of Horticultural crops including

fruits, vegetables, spices, plantation crops, medicinal and aromatic plants of high economic values. A wide range of tropical, sub-tropical and temperate fruits such as Mandarin Orange, Pineapple, Banana, Lemon, Guava, Pear, Plum etc. are grown all over the State. A large variety of vegetables both indigenous and exotic are grown in many places of the State. The high altitudinal places of the State provide good opportunity to grow vegetables including potato, and Cole crops during the rainy season. Tuber and root crops such as sweet potato and Tapioca, Spices crops such as Tumeric, Ginger, Chillies, etc. grow abundantly in the State. Recently, plantation crops such as Tea, Cashewnut, Coconut, Arecanut, Black pepper have been introduced and are coming up with promise. These in the long run can change the entire economic situation of the people of the State.

At present around 9.82 % of the geographical area of the state is net sown area (2,18,892 ha) and the scope of adding new areas under agronomical crops are limited.

On the other hand, according to the Land Utilisation Statistics of 2004-05 around 11.27 % (4,51,098 ha) and 7.51 % (1,67,313 ha) of the total reporting area of the state (22,27,100 Ha) are lying as 'Cultivable Wasteland' and 'Fallow land other than Current Fallow' respectively. In other words, the area under the two aforementioned categories (6,18,411 ha) covering around 27.76% of the total reporting area of the state represents potential area for addition to the current area under Horticulture. (Table - XII).

Table - XII
Estimated Potential Area (ha) for extension of Horticulture derived from
Land Utilisation Statistics 2004-05 (Provisional)

Particulars	R.B	E.K.H	W.K.H	J.H	E.G.H	W.G.H	S.G.H	Total
1	2	3	4	5	6	7	8	9
a) Reporting Area	243700	272200	517100	381100	259300	369600	184100	2227100
b) Cultivable Wasteland	58446	57409	109674	120045	47773	34681	23070	451098
c) Fallow other than Current fallow	9860	6501	47694	17682	22220	43113	20243	167313
Total (c + d)	68360	63910	157368	137727	69993	77794	43313	618411

12.1. Agro- climatic Zones: Meghalaya is located within the Eastern Meghalaya Zone – II which is further sub-divided into 5 (five) sub-regions, taking into consideration topography, rainfall, temperature, soil type and cropping system of which Meghalaya comes within Sub-Region – II.

For the purpose of planning for development, research and extension, pending further detailed delineation of agro-climatic zones, the state can be divided into 3 (Three) zones for working conditions. Broad outlines of the horticultural crops grown in each zone are as follows:

Tropical Zone (100 – 300 msl)	Sub-tropical Zone (300-1100 msl)	Temperate Zone (1100-2000 msl)
1	2	3
1. Litchi 2. Papaya 3. Lemon 4. Orange 5. Pineapple 6. Banana 7. Guava 8. Arecanut 9. Black pepper 10. Betel leaf 11. Coconut 12. Turmeric 13. Cinnamon 14. Chilli 15. Potato 16. Sweet Potato	1. Litchi 2. Lemon 3. Orange 4. Guava 5. Grape fruit 6. Pineapple 7. Ginger 8. Turmeric 9. Cinnamon 10. Chilli 11. Potato 12. Sweet Potato 13. Vegetables	1. Plum 2. Peach 3. Pear 4. Apricot 5. Chestnut 6. Potato 7. Spices 8. Off season vegetables

12.2. Major Horticultural Crops:- Due to its diversity in climate, topography, soil profile etc, a wide range and variety of horticultural crops like fruits, vegetables, spices and a variety of colourful and attractive flowers, ornamental plants and orchids can be found and successfully grown.

Table - XIII
FRUIT CROPS ACHIEVEMENT

Year		Pineap- ple	Citrus	Banana	Papaya	Temp Fruits	Misc Fruits
1	2	3	4	5	6	7	8
1997-98	Area	9298	7505	5229	486		
	Prodn	80404	35549	63011	3980		
	AY	8647	4737	12050	8189		
1998-99	Area	9291	7523	5194	495		
	Prodn	80116	35205	62888	3997		
	AY	8623	4680	12108	8075		
1999-00	Area	9382	7648	5319	8075		
	Prodn	82461	34173	63383	3941		
	AY	8789	4456	11916	7773		
2000-01	Area	9235	8089	5377	531		
	Prodn	81723	32311	64100	4233		
	AY	8849	3994	11921	7973		
2001-02	Area	9315	8043	5311	535		
	Prodn	82398	34668	63773	4297		
	AY	8846	4310	12008	8032		
2002-03	Area	9389	7987	5344	535		
	Prodn	83333	32791	65659	4326		
	AY	8876	4106	12286	8086		
2003-04	Area	9480	8046	5628	652		
	Prodn	91671	36636	66875	4435		
	AY	9670	4553	11883	6802		
2004-05	Area	9565	9808	6276	582		
	Prodn	92036	38989	67838	4484		
	AY	9622	3975	10809	7704		
2005-06	Area	10135	8871	6426	584		
	Prodn	93625	36893	71695	4667		
	AY	9238	4159	11157	7991		

13 HORTICULTURAL PRODUCTION

13.1 Fruit Crops:- A variety of citrus fruits, pineapple, banana and temperate fruits among others are widely grown in the sub-mountain and foot hills area of the state.

a) Citrus: Among the Citrus fruits the most dominant economic crop of the State is Mandarin Orange. Khasi Mandarin is adjudged as an important variety widely known in the North East region and outside having good acceptance among the consumers. Citrus fruit is mainly

grown in the Sub mountainous tract along the Indo – Bangladesh border regions of the state.

b) Pineapple: It is one of the three most important fruit crops besides Mandarin Orange and Banana with the positive average growth rate in production. The fruit does well up to 100 m but foot hill up to 700 m are best for its yield. Pineapple varieties like Giant Kew and Queen is another commercial fruit crop found in the Sub Mountainous tract in the Northern part of East and West Khasi Hills as well as the Northern and Southern part of Garo Hills.

c) Banana: Varieties like Jahaji, Chenichampa, Malbhog and Indigenous varieties are commonly grown in the region. Recently Tissue Cultured Banana saplings were doing well in the region. Banana commands a considerable economic importance and is grown in the low hill areas of the State.

d) Temperate Fruits: Temperate fruits like Plum, Peach, Pear, Apricot are found in the central plateau of East and West Khasi Hills and Jaintia Hills.

e) Other fruits now grown with limited stress and acreage but having great potentiality are Guava, Mango, Litchi, Lime/Lemon, Sweet Orange, Papaya etc. Besides there is highly propitious conditions in the State to grow some other nutritious fruit crops such as Jackfruit, Berries, Custard apple, Sapota etc. These are relegated to the status of minor crops grown in sporadic form and yet to receive due importance in the economy. The State is not suitable for commercial cultivation of apple in absence of adequate chilling hours (800 – 1600 hours below 7 degree centigrade) needed for the crop although high hills can be exploited for growing low chilling apple cultivars.

The average annual growth rate in production of all the horticultural crops is positive except Mandarin orange, which showed a negative rate of 1.17 thousand tonnes (Table – XIII & XIV).

f) New foray is also being initiated and undertaken in growing of strawberry, passion fruit, ornamental flowers (rose, liliun, anthurium, gerberas, carnations, BOP etc)

Table - XIV
Annual Average, Computed Annual Growth Rate of Fruit Crops (2001-02 to 2005-06).

Sl. No.	Name of Crops	Annual Average between			Average annual growth Rate			% of Average growth Rate		
		Area 000' Ha.	Prodn 000' tons	Yield Kg./Ha.	Area 000' Ha	Prodn 000' tons	Yield Kg./Ha	Area %	Prodn %	Yield %
1	2	3	4	5	6	7	8	9	10	11
1	Pineapple	9.58	88.61	9250.40	0.17	3.12	153.00	1.82	3.52	1.65
2	Citrus Fruits	8.50	36.19	4220.60	0.35	1.17	-43.30	4.07	3.22	-1.03
3	Banana	5.79	67.16	11628.60	0.32	1.80	-317.90	5.44	2.68	-2.77
4	Papaya	0.57	4.44	7723.00	0.02	0.09	-76.40	2.61	2.03	-0.60

Table-XV
Annual Average and Computed Annual Growth Rate of Vegetable Crops in Meghalaya (2001-2002 to 2005-06)

Sl No	Crop	Annual Average			Average Annual Growth			%of Average annual growth rate		
		Area '000 ha	Prodn '000 mt	Yield kg/ha	Area '000 ha	Prodn '000 mt	Yield kg/ha	Area % '000 ha	Prodn% '000mt	Yield % kg/ha
1	2	3	4	5	6	7	8	9	10	11
1	Onion	0.22	2.31	9708	-0.01	0.05	517.50	-2.82	2.54	5.33
2	Cabbage	1.46	30.21	20638	0.01	0.12	-92.70	0.85	0.41	-0.45
3	Cauliflower	1.09	17.61	16124	0.01	0.12	2.60	0.69	0.70	0.02
4	Peas	0.58	3.48	5964	0.01	0.09	60.90	1.54	2.57	1.02
5	Ladies finger	0.57	4.67	7994	0.01	0.07	47.60	0.80	1.40	0.60
6	Brinjal	0.56	8.97	11819	0.01	0.10	10.00	0.98	1.06	0.08
7	Carrot	0.52	6.35	12293	0.00	0.11	138.40	0.64	1.79	1.13
8	Tomato	1.71	22.77	13309	-0.02	0.02	136.90	-0.97	0.07	1.03
9	Turnip	0.45	5.77	12720	0.00	0.05	-13.50	0.90	0.08	-0.11
10	Bottle gourd	0.36	3.87	10765	0.01	0.05	-1.20	1.39	1.38	-0.01
11	Radish	0.73	9.03	12314	0.01	0.09	25.60	0.96	1.00	0.21
12	Beans	0.62	3.84	6176	0.02	0.10	-19.70	2.80	2.46	-0.32
13	Pumpkin	0.96	10.72	11173	0.02	0.22	58.00	1.54	2.06	0.52

13.2 Vegetables:- Meghalaya is known for its vegetables in the north-east. Cabbage, cauliflower, radish, tomato, carrot, squash etc are regularly marketed outside the state. The area, production and productivity in the vegetable sector have been showing an upward trend except for certain crops..

The Computed Annual Growth Rate of vegetables for the period 2001-02 to 2005-06 (ref Table – XV) shows a positive trend in area and production significantly with respect to Cole crops, Carrot, Radish, and peas.

The most heartening aspect in the vegetable sector is the rise in productivity in most vegetable crops except in Cabbage, Turnip, Bottle gourd and Beans (Table – XV). Tomato cultivation has become a special feature in the Umsning-Nongpoh belt where the farmers of this region are growing tomatoes in both the Kharif and Rabi seasons. Tomato cultivation introduced in the high altitude regions of East Khasi Hills is proving to be very successful. It was initially felt that tomato could not be cultivated during summer months in the high altitude regions due to heavy blight infestation. However, formulation of a spray schedule has been successful in controlling the disease. Cultivation of tomato has spread to different parts of the district in the higher regions; primarily due to high rate of returns derived from tomato cultivation harvested during the off-season from June to October when tomatoes from other neighboring states are not available.

The Department is taking steps to accelerate the growth of the vegetable sector by encouraging farmers to grow vegetables in polyhouses/shade nets by providing subsidy on the cost of such houses. Vegetable production under polyhouses is expected to double the productivity. Also special efforts are being made to extend vegetable cultivation in and around administrative headquarters to meet the increasing demand for vegetables at these centres.

The agro-climatic conditions in Meghalaya favour the cultivation of vegetables round the year. This climatic advantage is reflected in good prices fetched by vegetables when they are in off-season in neighbouring states. On the whole, the revenue returned from vegetables tends to be higher than from cereals. Moreover, they can be grown in homesteads or on gentle slopes near the homesteads, facilitating the farmers to pay full attention to their care and maintenance regime.

Table - XVI
AREA PRODUCTION AND YIELD OF TUBER CROPS

Area = In Hectares

Prodn = In MT

Yield = In Kg/Hect

Year		Potato	Sweet Potato	Tapioca
1	2	3	4	5
1995-96	Area	20863	5153	3876
	Prodn	208630	16064	21481
	AY	10000	3117	5542
1996-97	Area	19547	5211	3868
	Prodn	200749	17054	21766
	AY	10270	3273	5627
1997-98	Area	20764	5212	3959
	Prodn	200506	16978	21087
	AY	9656	3257	5326
1998-99	Area	20753	5212	3963
	Prodn	201059	16978	21251
	AY	9688	3257	5326
1999-2000	Area	18339	5181	4022
	Prodn	143287	17291	21497
	AY	7813	3337	5345
2000-01	Area	18318	5220	4110
	Prodn	144292	17591	21879
	AY	7877	3376	5323
2001-02	Area	18151	4942	3971
	Prodn	159032	16627	20367
	AY	8762	3364	5197
2002-03	Area	18071	4953	3958
	Prodn	167884	16412	20590
	AY	9290	3314	5202
2003-04	Area	18035	4853	3974
	Prodn	149428	16016	20588
	AY	8285	3300	5181
2004-05	Area	17287	4974	3975
	Prodn	141622	16172	20644
	AY	8192	3251	5193
2005-06	Area	17986	4975	3989
	Prodn	167030	16270	20841
	AY	9287	3270	5225

TABLE - XVI - A
ANNUAL AVERAGE AND COMPUTED ANNUAL GROWTH RATE OF TUBER
CROP FOR THE PERIOD 2001-02 TO 2005-06

		Potato	Sweet Potato	Tapioca
1	2	3	4	5
Annual Avg	Area `000 ha	17.90	4.94	3.97
	Prodn `000 mt	157.00	16.30	20.60
	Yield kg/ha	8763.20	3299.80	5199.60
Avg Annual Growth	Area `000 ha	-0.11	0.01	0.00
	Prodn `000 mt	-1.03	0.09	1.10
	Yield kg/ha	-4.80	-25.10	4.70
% Avg Annual Growth rate	Area `000 ha	-0.63	0.16	1.10
	Prodn `000 mt	-0.65	0.58	0.49
	Yield kg/ha	-0.05	-0.76	0.09

13.3 Tuber Crops:- Among the various tuber crops grown in the state, the following three, viz, Potato, Sweet Potato and Tapioca are cultivated. Potato is extensively grown in the East and West Khasi Hills District, Tapioca is found in Ri-Bhoi and Garo Hills District while Sweet Potato is cultivated throughout the state. However, though the area under Sweet Potato and Tapioca are relatively significant, their commercial value is rather low. Hence in this category we shall reckon with only the profile with Potato cultivation during the period 1995-96 to 2005-06 (ref Table XVI). Fitting the trend line to the area, production and productivity of potato, it is observed from Table XVI-A, there is a mark decrease in the area, production and productivity by -0.63%, 0.65% and 0.05% respectively

Potato has been the most important commercial crop of the Shillong plateau. Potato was introduced very early in Khasi Hills during the British period. The old varieties like Great Scot, Up-to-date and Royal Kidney were till recently the main varieties, which have now been replaced to a great, extend by the “Blight resistant/tolerant varieties like Kufri Jyoti and Kufri Megha. The Kufri Megha variety was developed at the Central Potato Research Institute, Upper Shillong.

The Potato farmers of the Shillong plateau are widely acknowledged to be amongst the best farmers east of the river Ganges. They follow the prescribed package of practices religiously and accept new technology, new seeds and new plant protection measures with alacrity. However, since the soil is poor, coupled with high labour cost, the productivity is low and steadily declining despite the fact that the

farmers using farmyard manure, chemical fertilizers and follow the timetable for prophylactic spray of fungicides against both early and late blight. The net result of all these variables is that the profit per unit of investment is low.

Table - XVII
AREA PRODUCTION AND YIELD OF PLANTATION CROP

Area = In Hectares
Production = In Metric Tonnes
Yield = In Kgs/Hect

Year		Tea	Arecanut	Cashewnut
1	2	3	4	5
1995-96	Area		9466	6188
	Prodn		10318	6000
	AY		1090	970
1996-97	Area		9510	6212
	Prodn		12033	6284
	AY		1265	1015
1997-98	Area	185	9543	6238
	Prodn	442	12071	6313
	AY	2390	1266	1013
1998-99	Area	227	9585	6248
	Prodn	556	11567	6335
	AY	2446	1207	1014
1999-00	Area	257	9684	6401
	Prodn	642	12579	6419
	AY	2500	1299	1003
2000-01	Area	508	11184	6320
	Prodn	1212	13715	6294
	AY	2386	1226	996
2001-02	Area	617	11128	6347
	Prodn	2827	14101	6418
	AY	4582	1267	1011
2002-03	Area	657	11189	6649
	Prodn	3059	14167	6730
	AY	4656	1266	1012
2003-04	Area	1086	11189	6708
	Prodn	3713	14244	6787
	AY	3419	1273	1012
2004-05	Area	1198	11233	6765
	Prodn	3747	14169	8846
	AY	3128	1261	1308
2005-06	Area	1320	11507	6785
	Prodn	5610	15530	11207
	AY	4250	1350	1652

TABLE - XVII - A
ANNUAL AVERAGE AND COMPUTED ANNUAL GROWTH RATE OF
PLANTATION CROP FOR THE PERIOD 2001-02 TO 2005-06

		Tea	Arecanut	Cashewnut
1	2	3	4	5
Annual Avg	Area `000 ha	0.97	11.24	6.64
	Prodn `000 mt	3.79	14.40	7.99
	Yield kg/ha	4007.00	1283.40	1199.00
Avg Annual Growth	Area `000 ha	0.20	0.08	0.10
	Prodn `000 mt	0.63	0.29	1.17
	Yield kg/ha	-219.20	16.10	157.80
% Avg Annual Growth rate	Area `000 ha	20.21	0.72	1.51
	Prodn `000 mt	16.56	1.98	14.63
	Yield kg/ha	-5.47	1.25	13.00

13.4 Plantation Crops:-There are three important Plantation Crops within the purview of the Agriculture Department viz, Arecanut, Cashewnut and Tea. In recent years Coconut has been introduced but the area and production is still too small and is therefore not being reckoned with here.

13.4(a) **Arecanut:-**Since time immemorial Arecanut has been grown in Meghalaya as an important commercial crop. In the recent past this crop has been introduced on the northern slopes of Khasi Hills in the Ri-Bhoi district and is found to be doing well. However, this crop is suffering from a disease called 'Bud Rot'. The disease starts from the top and moves downwards. The measures against 'Bud Rot' are known, but the terrain acts as a serious constraint to spraying operations and its control.

Hence, the computed growth rate (Table XVII-A) for the period 2001-02 to 2005-06 indicates a growth rate of 0.72%, 1.98% and 1.25% in area, production and productivity respectively.

13.4(b) **Tea:-** Long ago it was felt that the mid regions of Meghalaya were agro-climatically suitable for growing tea. In 1974 on the recommendation of the Tea Board officials, Tea Experimental Stations were established at Umsning in Ri-Bhoi District (2.5 ha); Riangdo in West Khasi Hills District (2.0 ha) and Thebronggiri in West Garo Hills District (1.6 ha) in the year 1976 – 77.

The results from all the three stations were encouraging and it was decided to encourage farmers to grow tea as a homestead crop. In order to supply good planting materials of varieties approved by the Tea Board, the Agriculture Department established a Tea Nursery at Umsning in Ri –

Bhoi District and Rongram in the west Garo Hills District in 1982 – 83. Apart from the two tea nurseries i.e. Umsning and Rongram, the Government under the Directorate of Horticulture has started small-scale tea nurseries at Riangdo, Thadlaskein, Umwang and Upper Shillong. During the current year it is proposed to set up tea nurseries in all the seven districts as the farmers have shown interest in growing tea as a household crop.

The Department have introduced a package incentive scheme which includes (a) Cash Subsidy of Rs 15,000/- per hectare and (b) Supply of plant protection materials like insecticides, weedicides, fungicides etc at 50% subsidy.

At present the area under tea is being expanded in villages around tea nurseries. The nurseries are manned by tea specialists who oversee the tea gardens in the farmers' fields and assist the farmers in marketing green leaves, in addition to ensuring the flow of good planting material through the departmental nurseries.

The response of the farmers in the target areas is encouraging and the area under tea is increasing annually. Since the inception of the scheme i.e. 1984 – 85 to 2005-06 about 1320 hectares of land have been brought under tea plantation in the state producing about 5610 MT of green tea leaves during 2005-06 (Table XVII).

13.4(c) **Cashewnut**:- Cashewnut is extensively grown in Garo Hills. However the bulk of the produce is sold outside the state as raw products. The increase area under this plantation crop is due to the effort for reclamation of jhuming lands. Table XVII-A indicates that cashewnut is coming up as one of the major plantation crop. There is a significant increase in area, production and productivity viz; 1.51, 14.63 and 13.60 percent respectively.

13.5 Floriculture:- Meghalaya has a very high potential for commercial cultivation of ornamental crops due to a favourable climate enabling low cost cultivation of a variety of non cultivation , high value, long vast life and off- season flowers such as orchids , Bulbous plants, Bird of paradise, chrysanthemum Gerbera, Gladiolus, Marigold, Carnations etc. However, inspite of this, market potential is absent. It is envisage that Horticulture development should be through entrepreneurship and at present, government role is as a promotional agency, which provide support through technological and entrepreneurship training including supply of inputs and planting materials.

The government has in recent years implemented a scheme on a project mode by setting up Centre of Excellence for Rose (Ri Bhoi District) and Anthurium (East Garo Hills District) which served as demonstration C2C models. Such centres have had a cascading effect on the farmers of the districts where it is observed that they have taken up plantation of such crops on their own. However in the initial stage subsidy and expertise support is being provided by the department.

13.6 Spices:- Meghalaya has natural advantages in growing a variety of spices of which the prominent ones are turmeric, ginger, chilli, black pepper and bay leaf. Except for bay leaf, which is a forest product the other spices are cultivated. The cultivation of turmeric (Lakadong variety) is concentrated in the Nongbah – Shangpung belt of Jaintia Hill district while bay leaf is concentrated on the southern slopes adjoining Bangladesh. Chilli is grown all over the state while Ginger cultivation is concentrated in East and West Garo Hills and East Khasi Hills Districts. Large Cardamom has been introduced recently and is slowly becoming popular with the farmers.

Fitting the trend line to the last 10 years (Table XVIII), and the computed growth rate of five years (Table XIX), it is observed that all the other spices crop showed a marked increase in area, production and productivity.

13.7 Medicinal Plants:- Meghalaya a treasure trove of medicinal plants has a long history in the traditional system of medicinal as well as folk prescription. Nature in its generous abundance has bestowed on Meghalaya a unique array of vegetation rich in medicinal properties. More than 800 medicinal plants species have already been listed while many remain untapped. A few of the examples are Solanum Khasianum, Dioscorea Composita, Periwinkle (Catharanthus roseus) Artemisia nilagirica, Taxus baccata, Litsea citrata, Gaultheria fragrantissima, Potentilla fulgens, Smilax glabra and others species, Swertia Chirata, Centella asiatica, Aristolochia, Panax Wangianus etc.

13.8 Indigenous Plants: Meghalaya abounds in various indigenous fruit plants, herbs and shrubs etc, which are probably not found anywhere else in the world. To this extent, the Department of Agriculture have already started exploiting commercially some of the varieties through fruit processing units, thereby providing a monopoly in economic terms, be it as fruit value per se or as pickles, medicinal, dyes, aromatic etc. Some of

these unique plants are: Myrica nagi (Sohphie), Prunus nepalensis (sohiong), Eleagnus Khasianum (Sohshang), Flemingia vestita (Sohphan), Docynia indica Khasiana (Soh Phoh Khasi) etc.

Table - XVIII
AREA PRODUCTION AND YIELD OF SPICES CROP

Area = In Hectares
Production = In Metric Tonnes
Yield = In Kgs/Hect

Year		Ginger	Turmeric	Chillies
1	2	3	4	5
1996-97	Area	7309	1397	1760
	Prodn	46179	7126	1097
	AY	6318	5101	623
1997-98	Area	7357	1401	1768
	Prodn	45260	7126	1108
	AY	6152	5086	627
1998-99	Area	7403	1375	1764
	Prodn	45590	6997	1051
	AY	6158	5089	596
1999-00	Area	7607	1467	1790
	Prodn	43369	8353	1128
	AY	5701	5694	630
2000-01	Area	7811	1523	1810
	Prodn	44902	8565	1146
	AY	5749	5624	633
2001-02	Area	8897	1523	1852
	Prodn	46590	8577	1158
	AY	5237	5632	635
2002-03	Area	8896	1543	1809
	Prodn	46731	8642	1150
	AY	5253	5601	636
2003-04	Area	8882	1561	1807
	Prodn	49215	8656	1168
	AY	5541	5545	646
2004-05	Area	9222	1682	1844
	Prodn	47138	9316	1303
	AY	5111	5539	707
2005-06	Area	9625	1817	1844
	Prodn	53609	10508	1303
	AY	5570	5783	707
2006-07	Area	9637	1912	1870
	Prodn	57278	14349	1375
	AY	5943	7505	735

Table – XIX
**Annual Average and Computed Annual Growth Rate of Spice Crop
for the Period 2001-02 to 2005-06**

		Ginger	Turmeric	Chilli
1	2	3	4	5
Annual Avg	Area `000 ha	9.10	1.62	1.82
	Prodn `000 mt	48.62	9.14	1.21
	Yield kg/ha	5242.40	5620.20	666.20
Avg Annual Growth	Area `000 ha	0.19	0.07	0.01
	Prodn `000 mt	1.46	0.46	0.05
	Yield kg/ha	52.40	24.00	21.50
% Avg Annual Growth rate	Area `000 ha	2.03	4.44	0.44
	Prodn `000 mt	3.00	5.01	3.71
	Yield kg/ha	0.98	0.43	3.23

13.9 Mushroom:- Meghalaya offers great potential for production of Mushroom. A Regional Centre for Training and Production of Mushroom in North Eastern Region sponsored by North Eastern Council was established in February 1982 at the Agricultural Complex, Upper Shillong. The major aims and objectives of this centre are:

1. Production and supply of quality spawn.
2. Provide training facilities to interested entrepreneurs for mushroom cultivation.
3. Preparation of sterilised compost
4. Dehydration and marketing facilities.

The Centre is currently concentrating on the production and extension of (i) Agaricus spp (White Button Mushroom) and (ii) Pleurotus spp (Dhingri/Oyster Mushroom). Of all the different mushrooms that can be grown by the farmers these two varieties have the strongest market potential. Cultivation of mushroom in homestead is becoming very popular because of high yield and remunerative price it fetches. At present there are mushroom farmers all over Meghalaya identified as trained growers and training sessions are being held regularly in villages in all the districts of the state.

The centre is currently concentrating on the production of Dhingri/Oyster Mushroom in contrast to Button Mushroom for the following reasons:

- i) Dhingri/Oyster mushroom is amendable to dehydration but not Button Mushroom.

ii) Dehydration technology is simple and cheap for Dhingri/Oyster mushroom, therefore they are much cheaper than Button mushroom which on the other hand can only be canned.

iii) Canning technology for Button mushroom is sophisticated and expensive and therefore the ultimate retail price is much higher than that of Oyster mushroom.

Meghalaya produces about 5(five) metric tonnes of fresh mushroom, which are marketed locally. The production starts from March to October.

14. Fruit Processing Units:- There are two existing fruit processing units in the state, one at Shillong in East Khasi Hills with an installed capacity of 10 MT and the other at Dainadubi in East Garo Hills District with an installed capacity of 40 MT. These factories manufacture Squashes, Canned Fruits and Juices, Jams, Jellies, Marmalades and Pickles.

Apart from producing the conventional items like Orange Squash and Pineapple Jam, etc, these factories have recently started using indigenous fruits like Sohbrab (passion fruit), Sohpyrshong (Carombola), Soh Shang (*Elacagus sapida*) and Soh Phie (*Myrica Nagi*) to produce Squash, jam, pickles etc. Pineapple and Orange drinks packed in 200 ml RTS (ready to serve) packs have also been added to the list of items produced by these factories.

15. Strategy for the Development of Horticulture

15.1 Technology Development and Transfer:

1. Augmentation and upgradation of State level Horticultural Research and development Organization.

2. Identification and evolution of multidisciplinary package of compatible technologies for integrated development of horticulture with inbuilt soil conservation mode, for each climatic/altitudinal zone.

3. Adaptation and refinement of existing Indigenous technologies, for improving quality and productivity of horticultural crops.

4. Evolution of technologies for adequate neutralization of soil alkalinity and replenishment of micronutrients.

5. Emphasis on technologies for raising of high value horticultural crops.

6. Evolution of technologies for raising of high value horticultural crops.

7. In situ multiplication of endangered species of plants and orchids, for their plan and commercial exploitation.

8. Technologies for cost effective in situ conservation of gene-pool/germplasm bases.

9. Technologies for optimum mix of different species to ensure perennial continuum of generated green cover across horticultural plantations.

10. Popularization of cost-effective tissue culture technologies.

11. Establishment of Demonstration and Adaptive Trial Centres in each climatic/ altitudinal zone.

12. Development and popularization of horticultural implements, tools and machinery keeping in view zonal topography and existing traditional and indigenous practices.

15.2 Production and Input Services:-

1. Establishment of a Regional Horticultural HRD Centre for overcoming shortages of trained manpower.

2. Strengthening of existing Horticultural Extension and Farmer training Institutions with facilities for intensified Visit and Training of Growers including Farmers' Training of Master Trainers and Extension Workers in accepted technologies to receive high priority.

3. Establishment of KVKs for each climatic/altitudinal zone with inbuilt Information and Audio – Visual Centre.

4. Provision of incentives for establishment of Nurseries with adequate capacity for generating quality planting material. Raising of nurseries by approved horticulturist, with standing Organization for certifying quality of planting material to be encouraged.

5. Strengthening of extension and promotional services with adequate emphasis on motivational IEC programmes.

6. Simplified flow of soft credit for horticultural development programmes from NHB, NSCSTFDC, NEDFI, etc.

7. Implementation of IHD programmes through User-Groups consisting of Stake Holders only.

8. Provision of Crop-Insurance against pest and weather damages.

9. Adoption of biological, eco-friendly Integrated Pest Management methodologies, which are compatible and effective for given climatic/altitudinal zones.

10. Horticulture based Social Forestry/ Afforestation Programmmes popularising only such horticultural species, which retain a green cover throughout the year, with emphasis on quality and productivity of crops.

11. Provision of incentives for adoption of plastic culture based horticultural including floricultural technologies.

12. Programme for popularising Sprinkler and Drip Irrigation based horticulture.

13. Establishment /Strengthening of State level Seed Certification Agency.

14. Strengthening of existing Seed Testing and Quality Control of Seed and Planting Material Laboratories.

15. Upgradation of State Level Soil Testing Services.

15.3 Post Harvest Handling and Processing:

1. Training of growers on post harvest crop management methodologies.

2. Provision of incentives for establishment of Collection Centres by Stakeholder User-Group in areas generating adequate marketable surplus.

3. Establishment of good godowns and cold storage centres with grading facilities at select locations.

4. Simplified flow of soft loans to Stakeholder User Group for organising cost effective transportation and marketing services.

5. Provision of incentives including soft loans for establishment/strengthening of Processing Plants for processing/preservation of existing marketable surplus of major crops of the State such as Tea, Cashew Nuts, Pineapple, Jack Fruit, Spices, Leaf-fibres and oleoresins.

15.4 Marketing and Export:

1. Establishment of export oriented Terminal and Regional Markets with facilities for Refrigerated Transport Services.

2. Establishment of a Regional Container and Packaging Production Centre.

3. Strengthening of Rural Primary Market Network.

4. Strengthening / Upgradation of Regional Market Information Intelligence Services.

5. Establishment of Quality Control Certifying (AGMARK) Agency.

6. Establishment of Phytosanitation Certifying Agency for facilitating export of horticultural products, particularly to Bangladesh.

7. Opening of Indo-Bangla border trade in respect of horticultural including cash crop produces.

15.5. Horticulture Farms and Nurseries in the State:-

Location	Area (ha)	Main fruits/Plants
1	2	3
<u>EAST KHASI HILLS</u>		
1. Government Fruit Garden including Vegetable and floriculture section Shillong	10.00	Plum, Peach, Pear, Naspati, Apricot, Chestnut,vegetables, ornamental crops.
2.Temperate Fruit Researc Station including Tea plantation & nursery Upper Shillong	11.00	Plum, Peach, PearKiwi,Tea etc.
3. Horticulture Farm cum Nursery, Wahjain	8.80	Litchi, Areca nut, Coconut, Orange, Assam lemon, Pineapple, Bay leaf etc.
4.Horticulture Farm Cum Nursery, Pomshutia.	8.00	Litchi, Areca nut, Coconut, Orange, Assam lemon, Pineapple.
5.Potato experimental and Research Station Upper Shillong.		Vegatables, Temperate Fruits etc.
<u>WEST KHASI HILLS</u>		
6. Horticulture Fruit Nursery, Phodkylla	80.00	Orange, Arecanut, Coconut, Valencia etc.
7. Horticulture Nursery, Nongstoin.	2.50	Vegatable Temperate fruit etc.
8. Tea Experimental Centre, Riango.	80.00	Sweet orange, Litchi, Sapota,
<u>RI – BHOI DISTRICT</u>		
9. Pineapple Research station cum Horticulture Farm and Nursery, Dewlieh, Umsning	7.50	Pineapple Guava, Pear etc.
10. Ginger Development Station, Umsning.	10.12	Ginger, Turmeric, Black pepper etc.
11. Tea Development Center, Umsning.	9.85	Tea
12.Horticulture Farm Cum Nursery,Byrnihat	10.50	Banana, Pineapple,Guava,Litchi etc.
<u>JAINTIA HILLS DISTRICT</u>		
13. Horticulture Farm Cum Nursery, Thadlaskein	10.00	Plum, Peach, Pear, Vegetables etc.
14 Horticulture Nursery, Saitsama.	10.00	Indigenous fruits, Tea,Citrus Fruits etc.
15.Horticulture Farm Cum Nursery ,Muktapur	3.00	Litchi, Arecanut, Orange, Assam Lemon etc.
16. Horticulture Farm cum Nursery, Mynkre	10.00	Orange, Assam Lemon etc.
<u>EAST GARO HILLS DISTRICT</u>		
17.Horticulture Farm Cum Nursery, Samgong.	7.00	Tea, Arecanut, Medicinal Plants, Indigenous Fruits, Mango etc.
<u>WEST GARO HILLS DIATRICT</u>		
18.Horticulture Farm Cum Nursery, Rongram	5.00	Orange, Arecanut, Cinnamon, Bayleaf, Large Cadamon etc.
19. Horticulture Farm Cum Nursery, Zikzak	8.00	Orange, Arecanut, Bayleaf, Litchi etc.
20. Horticulture Nursery, Damalgiri	1.00	Orange, Arecanut, Litchi etc.
21. Horticulture Farm Cum Nursery, Rangmalgre.	20.00	Arecanut, Coconut, Cashewnut, Black pepper etc.
<u>SOUTH GARO HILLS DISTRICT</u>		
22. Horticulture Farm Cum Nursery, Mineng	8.00	Orange, Black pepper Arecanut, Litchi Grape fruit etc.

N.B. In some of the above noted farms/nurseries vegetable seeds are also being multiplied.

16. COMMON STRATEGY

16.1 Extension and Farmers Training:- The Department has a Basic Agricultural Training Centre at Upper Shillong and three Farmers Training Centre at Upper Shillong, Tura and Jowai for imparting training to the farmers in modern methods of cultivation. In addition there are also four Farmers Institutes at Nongstoin, Nongpoh, Williamnagar and Baghmara. The Department is alive to the fact that “development is in the mind”, and is taking all possible measures to narrow the gap between lab and land and towards this end. The Information Wing of the department assists in spreading developmental messages. The Information Wing is equipped with a printing press, Audio-Visual and Photographic equipment to assist the extension machinery. The Information wing also produces and publishes Agricultural News letter and Agricultural Market News bulletin in English as well as leaflets, booklets, pamphlets and brochures on the cultural practices of important crops in the Khasi and Garo languages. The published materials are distributed to the farmers through the Districts and Sub-Divisional Agricultural network free of cost for wide publicity.

16.2 Agricultural Engineering (Mechanical):- Machineries such as tractors, power-tillers are being maintained and run by the Department and these machineries are hire-out to farmers of the State to meet their needs while transporting Inputs and Outputs to and from the farm, provide tillage facilities to farmers as well as land development machineries through the use of these machineries which are subsidised upto 60% of the running cost by the Department . To enable the farmers to have their own tillage, irrigation and transportation facilities readily available with them, subsidy to the tune of 50% of the cost of Power Tillers and Power Pumps and Rs. 95,000/- per tractor are also being offered to willing farmers by the Department.

Since the inception of the Loan – Cum Subsidy Scheme for purchase of Agriculture Machineries the Department has been able to provide 48 nos. of tractors 532 nos. of power tillers and 78 nos. of power pumps at 50% subsidy to deserving farmer of the State.

16.3 Agricultural Research:- The Department has three Research Stations cum Laboratories at Shillong, Jowai and Tura. Recently two more research Stations have been set up at Nongstoin and Williamnagar. The main objective of the Research Stations is to conduct location

specific adaptive trials on different crop parameters for establishment of their viability before their introduction among the farmers. They also carry out soil analysis free of cost and recommend location specific crop wise fertilizers doses for the benefit of the farmers. There is also one Seed Testing Laboratory located at Shillong, which carry out seed viability and germination tests of different seeds. Basic Research in Agriculture in the State however, is conducted by ICAR.

16.4 Minor Irrigation:- Assured Irrigation is considered absolutely necessary to increase productivity, facilitate the farmers option for multiple cropping and minimise the evils of 'jhuming'. The state due to its topography has more scope for small irrigation projects. So far 24460 hectares area have been brought under assured irrigation through 173 nos of Flow/Lift Irrigation projects spread all over the state. However, there are 40 nos of new on going projects, which, some of them are expected to be completed soon. The work of identification of new irrigation schemes and their prioritizations is an on going function of the Minor Irrigation Wing of the Department.

Rural development and prosperity through Irrigation has been a dominant theme in the Indian Economic Planning since the very beginning of the era of the Five-Year Plans. The ideal typology that the Plan papers assume is that irrigation would:-

- a) Erase the fluctuations of monsoon and provide water input as and when required in the main agricultural season and,
- b) Permit the cultivation of a large area during the main as well as secondary agricultural seasons.

In other words, irrigation is expected to provide assured water input for multiple cropping during an agricultural year. This expectation in Meghalaya has not been fulfilled due to a multiplicity of causes like the denudation of forests in the catchments areas of the irrigations projects, leading to a high intensity of flash floods and siltation, causing heavy damage to irrigation structures and fixtures, making them dysfunctional. In addition, whatever utilisable irrigation potential exists cannot be utilized fully during the Rabi season because a majority of the farmers have not yet leap-frogged the techno-cultural gap between 'Jhum' and Settled Cultivation.

On the National scene the bulk of the work undertaken under Minor Irrigation relate to the schemes, which utilised ground water. But in Meghalaya underground water is available only in the narrow riverine systems, which are more or less adjacent to the Brahmaputra valley.

According to the estimates of the Indian Institute of Remote Sensing and National Bureau of Soil Survey and Land Use Planning, Jorhat, the ground water potential is only 0.29 cubic km/year.

16.5 Agricultural Marketing:- The Agricultural Department has a Marketing Wing . Its main objective is collection, compilation and reporting of reliable and accurate data on Market intelligence and market sentiments of the important agricultural commodities for utilisation by the State as well as the Central Government for review and formulation of economic policies and for implementation of agricultural prices policy etc, by way of establishing Market Intelligence Network throughout the state. Transport subsidy is provided to the Co-operative organisations for organised procurement of fruits and vegetables from interior areas and disposal in urban areas. Grading and grinding equipments are provided to entrepreneurs at subsidised rates to encourage the setting up of small-scale cottage level agro base industries in the state.

The Meghalaya State agricultural Marketing Board was set up in 1983 for organised marketing and market regulation and ensure financial returns to the farmers and remunerative prices for their produce. Secondary Regulated Markets and Primary Markets were established in different locations of the state. At present there are two (2) Secondary Regulated Market Yards in the state located at:

- i) Mawiong, East Khasi Hills District for dealing with the commodities like potato, ginger, broomstick, tezpatta etc. and
- ii) Garobadha, West Garo Hills District for dealing with jute, mesta, cotton, mustard pineapple etc.

Two Cold Storages of 1000 MT capacity have been set up at the above two markets for more efficient marketing and storing of Agricultural produce. Besides three numbers of Rural Godowns of 250 MT capacity at Gokugiri, Kharkhutta and Mawiong and a number of market stalls have also been constructed.

An 'AGMARK' Laboratory to regulate, monitor and issue of certificate of Authorisation for maintenance of quality control of agricultural produce have also been established in the office of the District and Local Research Station and Laboratories, Shillong.

16.6 Crop Insurance:- Agriculture is a risky business . Drought, flash floods, plant diseases and pests as well as other natural and economic calamities are a continuous threat to the agricultural producers. Thus to relieve the farmers of losses, the New National Agriculture Insurance Scheme or RKBY (Rashtriya Krishi Bima Yojna) replacing the old

Comprehensive Crop Insurance Scheme is being implemented by the Agriculture Department w.e.f 2000 – 2001 The main objectives of the scheme are:

(a) To provide a measure of financial support to farmers in the event of crop failure as a result of natural calamities etc.

(b) To restore the credit eligibility of the farmer after failure of crop for the next season and

(c) To support and stimulate the production of major crops.

The scheme is compulsory for loanee farmer and optional for non-loanee farmer on payment of a nominal premium with 50% subsidy to small and marginal farmer. The crops covered under this scheme are Rice, Potato, Cotton, and Soybean in the first year and all other horticultural crops by the third year.

16.7 National Watershed Development Programme for Rainfed

Areas:- The National Watershed Development Programme for Rainfed Areas (NWDPR) is a central scheme with a composite outlook and multi-disciplinary approach in order to protect land from all forms of deterioration, restoration of degraded and conservation of water for sustainable crop production. In the last Ninth Five Year Plan thirty-two (32) projects covering an area of 25,447 hectares have been treated under the different components of the scheme. In the current Ten Five Year Plan 78 new projects have been identified covering an area of about 40540 hectares.

17. DEVELOPMENT ACTIVITIES OF AGRICULTURE DEPARTMENT, MEGHALAYA

1. **Seeds:-** To popularise the use of High yielding and Improved variety seeds of cereals, pulses and oilseed crops, Demonstration programmes were conducted throughout the State quality seeds of the above crops are supplied at 50% subsidised cost to the farmers by the Department . Today we have around 40% area under paddy covered under HYV which had attributed to the increase trend in productivity and production although the net sown area has decrease .The state is also contemplating to set up large Sized Seed Farms in each of the seven Districts to meet the seed requirement of Farmers locally.

2. **Multiple cropping:-** To meet the food grains deficit in the State the scheme encourages the farmers to grow two to three crops in a year

and to increase production and productivity per unit through utilisation of Command area of irrigation projects or where irrigation facilities are available and Rainfed areas having enough residual moisture, inputs like H.Y.V Seeds, Fertilizers, Plant protection chemical are given free of cost and seeds of potato and other local improved varieties are sold at 50% subsidy to farmers. Training programmes in crop production are also under taken under this scheme.

3. Manures and fertilizers:- Consumption of fertilizers in the State has no appreciable increase in the last 14 years with the average of 18 Kgs. only per Hectare cropped area as compared to the National level of 50 Kgs. Per Hectare and it is estimated that 80% to 90%, of the total consumption being used for potato only. The use of fertilizers for foodgrain and other Horticultural crops are negligible, hence there was, no remarkable increase in production. Emphasis will also be given for use of organic manures and bio-fertilizers. To maintain the uniform rate of Fertilizers in the state, Transport subsidy according to distance are paid to distributors or retail dealer.

4. Plant Protection:- Plant Protection Chemicals (except Indofil M.45 which has been discontinued) and equipments are sold to farmers at 50% subsidised cost. The new concept of Integrated Pest Management (I.P.M) is now being encouraged to Farmers wherever applicable to use eco-friendly pesticides, lures and traps, insects Pest predators, Mechanical destruction of Pest and need based Plant Protection measures. A Bio - control Laboratory has been established at Upper Shillong under the Integrated Pest Management Programmes.

5. Commercial Crops:- Quality Planting materials, Plant Protection Chemicals and equipments for Commercial Crops like Arecanut and betelvine, jute, sunflower, cotton, potato, oilseed, ginger and turmeric, pulses, mushroom, spices and other cash crops are supplied to farmers at 50% subsidy. Grant- in- aid for the construction of arecanut soakage tank to arecanut growers are also provided.

a) Tea a non- traditional crop was introduced in Meghalaya in 1976-77 at the three experimental stations at Umsning of Ri- Bhoi District, Riango in West Khasi Hills and Rongram in West Garo Hills.

Encouraged by the results, a package scheme was introduced in 1988-89 for assistance to local cultivators for raising Micro sized tea plantation not exceeding 2 (Two) hectares area. Planting materials plus a

financial assistance of Rs.15,000 (Rupees fifteen thousand) per hectare are provided to the farmers according to the availability of fund. Training Programmes for Tea growers are also undertaken under this scheme.

Now more than 500 farmers have benefited from the scheme covering an area of 508 hectares with the estimated production of 4,90,113 kgs. More farmers have taken up tea plantation voluntarily hence actual area under tea are not available. Three privately owned factories has also been established, two at Rongram in West Garo Hills and one at Mawsyntai in Ri- Bhoi District.

b) Local farmers who take up Oyster and Button Mushroom Cultivation were closely supervised by the Department. A Regional Center for training and Production of Mushroom at Upper Shillong also provides special training and technical know- how to mushroom Farmers, quality spawn at subsidized cost and also encourages Farmer's to take mushroom cultivation. Sterilized compost for cultivation of mushroom is also supplied to the farmers' at subsidized rate.

c) Potato, one of the important Commercial Crop in the hilly plateau of Khasi Hills now faces a serious marketing problem from the cold storage stored potatoes of other States. However efforts are being made to encourage farmers to increased productivity (using HYV & disease protection) to reduce cost of production and to grow other Horticultural Crops besides potato.

6. Extension and Training:- Training Programme are conducted in Rural areas as well as at the District head Quarters as well as at the Farmer's Training Centre of Shillong and Tura and Training Institutes of Jowai, Nongstoin, Baghmara, and Williamnagar. The Upgraded Gramsevak Training Centre at Upper Shillong has been converted into a "Basic Agriculture Training Centre" (B.A.T.C) since 1998-99 to enable the educated unemployed youth to take up farming on their own for employment in Agriculture activities.

A Regional Centre for training and Production of Mushroom at Upper Shillong also provide special training and technical know- how to mushroom Farmers, quality spawn at subsidised cost and also encourages Farmer's to take mushroom cultivation.

The Agriculture Information Wing is equipped with a Printing Press, Audio Visual Aids and Photographic equipments to assist the extension programmes in the State. Booklets leaflets, pamphlets, bulletins etc. on Crop Production are printed for distribution to the farmers of all the Districts, besides Radio talk and Television Broadcast at D.D.K.

Laitkor and Audio Visual shows in rural areas on Agriculture are being conducted regularly.

7. **Agriculture Education:-** Students are provided stipends and sent to different universities in the country to study Agriculture including Agriculture Engineering according to seat and fund available , selected on merit basis.

8.**Agriculture Research Station & Laboratories:-** The existing Research Station and Laboratories at Shillong , Tura and Jowai carry out soil analysis free of cost for the farmers and recommended crop wise fertilizer dose for specific location for optimum use of chemical fertilizers and maximum benefits to the farmers. These stations also take agronomical trails of new strains to find out their location specific adaptabilities and generate data for the State Seed Sub Committee for the release of new promising crop varieties. The stations produce Mushrooms Spawn (Seeds) for sale to farmers as well as train the farmers in growing mushroom, identify and recommend remedial measures for uncommon insect test and diseases encountered by farmers and test the viability of supplier's seeds and farmer's own seeds free of cost.

9. **Horticulture Development:-** Quality planting materials of major Horticultural crops such as citrus, Pineapple, Banana, Stone fruits etc., are provided to farmers at 50% subsidy. Maintenance of Horticulture nurseries, demonstration of model orchards and citrus rejuvenation are also under taken in this scheme.

10. **Vegetable Development:-** Distribution of quality seeds/seedlings, plant protection chemicals and garden tools at 50% subsidy. Tomato crop, which is non-traditional crop, has become popular in Meghalaya and is being exported to almost all the North Eastern States.

11. **Floriculture Development:-** To motivate farmers to take up floriculture as a commercial venture, planting materials like seeds, seedlings, plantlets, Bulb, Tubers, mother plants are provided to the experienced flower growers of the region. Besides, organic manures, fertilizers, micro nutrients, rooting hormones, u.v. Films, nets, garden tools, plant protection equipments are also provided under the scheme.

12. **Organic Farming:-** Since time immemorial the farmers of the state have been using the organic forms of fertilizers to supplement the nutrients that are deficient to the soil . This practice is still being continued till the modern days. The reason behind is that this particular form of fertilizer not only enhances the soil fertility but also improves the conditions and structure of the soil in various ways. However with the introduction of High Yielding Varieties of crops like potato and vegetables coupled with the intensive cultivation, the supply of nutrients through the organic sources has been found to be inadequate, there by the need of inorganic form of fertilization is required. As it is now the chemical fertilizers consumption in the state is 17 kg/ha which is far below the national average. The consumption is limited mostly to potato and vegetables. Among the various sources of organic form of manures, Cowdung has been the most popular one for most potato and vegetables growers, in spite of its high price. The quantity of home produced Cowdung/local cowdung is very insignificant as rearing of cows is not popular among the local people. Therefore the farmers have to depend on cowdung brought from the neighbouring states of Assam in trucks, the price of which becomes very high at the farm site due to the cost of transportation. It is estimated that on an average the use of cowdung for potato and vegetables mainly Cabbage and Cauliflower is around 40-60 tonnes per Ha.

Strategy:- Meghalaya is characterized as the state with least application of Chemical fertilizers/ Pesticides , therefore it would be easier to shift to the organic form of cultivation . To achieve the objective, steps are being taken to create awareness among the farmers on complimentary use of Biofertilizer and organic manures in suitable combination, which would not only maintain higher Crop productivity but also sustain soil fertility. In this regard, the State Department is taking full advantage of the facilities offered by the Regional Biofertilizer Development Centre, Imphal, in popularising the use of Biofertilizer in the State.

Another steps being taken to promote the concept of organic farming is to give impetus for use of vermi compost for which the state Department is organising training programme on various aspects of organic farming in collaboration with the State Council of Science Technology and Environment, Government of Meghalaya. Financial assistance is also being extended by the state Department to groups of individuals for setting up of vermicompost units under the Integrated

Programme for Development of Horticulture under the Technology Mission Scheme.

13. **Fruit Processing:-** Two existing processing units at Shillong and Dainadubi processed parts of the Marketable Surplus of the States and impart training to local educated youth on processing to create employment opportunities through value additional activities on a cottage scale of Agricultural produce.

14. **Package Credit cum- Subsidy:-** Subsidy assistance of upto 50% on the project cost for raising long and medium gestation period horticultural and plantation crops like Mandarin orange, pineapple, cashewnut and coconut of not more than 0.5 hectares area per farmer are provided to the farmer.

15. **Agriculture Engineering (Mechanical):-** To motivate Mechanical agriculture operation to reduce the cost of production the Department provides 50% subsidy for purchase of power tillers and power pumps. The balance cost of the above, the farmer may avail credit from financial institutions or from his own resources. 60% subsidised tillage facilities by power tillers and Bull dozers for land development for Agricultural purposes on hiring basis are also available to farmers at District / Sub- Divisional head quarters. The Department is also preparing a new scheme for subsidising "Improved Agriculture Equipments" under the State Plan Scheme. Such equipment will be made available to farmers at 50% cost to farmers during the year 2000-01 onwards.

To popularize various Improved hand tools and Equipments necessary while nursing, harvesting and other related agricultural activities is being implemented and such tools equipments are being sold to farmers at 50% subsidy.

16. **Minor Irrigation:-** The Minor Irrigation Wing of the department is engaged with identification of irrigation potentialities of the State and installation of Minor Flows, and lift irrigation projects for increase crop productivity and production and facilitations of multi cropping. So far 28,208 hectares area have been brought under assured irrigation through 92 Nos of Flows, Lift irrigation projects spread all over the State.

17. **AGMARK:-** The AGMARK laboratory has also been established in the office premises of the Research Officer, District

Laboratories and local Research Stations, Shillong to maintain quality control of agriculture Products.

18. National Agriculture Insurance Scheme:- The new National Agriculture Insurance Scheme or the Rastriya Krishi Bima Yojana (RKBY) is being implemented by the Agriculture Department w.e.f 2000-2001. The scheme was earlier implemented by the Co- operation Department under the old Scheme known as the Comprehensive Crop Insurance Scheme. The Scheme provides insurance coverage for crop losses due to Natural calamities or Pest attack to all farmers, which is compulsory for loanee and optional for Non-Loanee farmers on payment of nominal premium with 50% subsidy to small and marginal farmers. The crops covered under this scheme are Rice, Potato, Cotton and Soya bean in the first year and all other Horticulture crops by the third year.

Besides the above State Scheme, several Centrally sponsored, central sector, NEC, Border areas, National Horticulture Board, Spices Board, Tea Board and Cashewnut Board Scheme are available for the development of Agriculture and Horticulture in the state. To improve the capabilities of the in service personals of the Department, Scheme for higher studies and training programmes are also available with the Government of India and N.E.C.

Under the 'National Watershed Development Projects for Rainfed Areas ' (NWDPR) which is 100% funded by the Central Government with the idea to conserve soil and water while human beings utilised the land for the livelihood. The State Government has successfully implemented 8 nos. of Watershed Projects during the 8th Five Year Plan period and 32 nos. with the average area of 500- 1000 hectares under each project were being implemented one each in every community and Rural Development Blocks in this 9th Five Year Plan period.

18. STATE PLAN SCHEME UNDER HORTICULTURE SECTOR
FOR 2002-2003

A. 2401- Crop Husbandry. Administration

001- Directorate &

(03) Directorate of Horticulture

(04) District Offices.

103- Seeds.

(08) Multiple cropping.

(09) Seed production & Multiplication Scheme. *

105- Manures & Fertilizers

(10) Fertilizers Distribution Scheme

(11) Organic Manures including Vermi Composting & Compost pit.

107- Plant Protection

(06) Plant protection including IPM.

108- Commercial Crops

(21) Plantation Crops Dev. Scheme (Arecanut, Cashewnut, Coconut) *

(22) Spices Dev. Scheme (Ginger, Turmeric, Large cardamon & Black Pepper.

(23) Tuber Crops Dev. Scheme (Potato, Tapioca, & Colocasia) *.

(24) Regional Center for Training & Production of Mushroom.

(25) Experimental Tea Plantation.

(26) Package Scheme for assistance to local tribal & cultivation.

(27) Indigenous Crops Dev. Scheme.

109- Extension & Training

(07) Agril. Information Unit

(08) Scheme on demonstration of liming.

115- Horticulture & Vegetable Crops.

- (15) Vegetable Dev. Scheme
- (16) Grand in Aid to Agri- Horti Society
- (17) Dev & Maintenance of Orchard – Cum- Hort. Nursery
- (18) Citrus Rejuvenation Scheme *
- (19) Fruit Dev. Scheme
- (20) General Horticulture Dev. Scheme
- (21) Package Credit – Cum- subsidy for assistance to small farmers for raising Hort. Nurseries
- (22) Establishment of large size Hort. Nurseries
- (23) Establishment of Directorate of Horticulture
- (24) Floriculture Dev. Scheme *
- (25) NABARD Loan for Dev. Of Hort. Crops
- (26) NHB Programmes for organising State level Workshop (State share).

800- Other Expenditure

- (06) Acquisition of Land

B. 2435- Other Agril. Programmes

01 - Marketing and quality Control

101- Marketing facilities

(01) Agril. Marketing Organisation including transport subsidy

(02) Fruit Processing Centre

**19. STATE PLAN SCHEME UNDER AGRICULTURE
SECTOR FOR 2002- 2003**

A. 2401- Crop Husbandry.

001- Directorate & Administration

(01) Directorate of Agriculture including JDA Tura

(02) District Offices

103- Seeds

(02) Seed Farms

(04) Seed Testing Laboratory

(05) Seed Production & Multiplication Scheme *

- (06) Multiple Cropping
- (07) Foodgrains Dev. Scheme *(Seed saturation & Demonstration)

105- Manures & Fertilizers

- (02) Fertilizers Distribution Scheme
- (04) Soil Testing Laboratory
- (05) State Soil Survey Organisation
- (06) Provision of finance assistance as subsidy to MECOFED for Fert. Storage.
- (09) Organic Manures including Vermi composition & Compost pit

107- Plant Protection

- (03) Bio- Control Laboratory
- (04) Plant Protection including IPM

108- Commercial Crops

- (04) Oilseed Dev. Scheme
- (07) Development of Pulses (State share)
- (13) Integrated prog. For Rice Dev. (State share)
- (14) Oilseed production Programme (State share)
- (18) Accelerated Maize Dev Programme State share)
- (19) Sugarcane Dev. Scheme *
- (20) Indegenous Crops Dev. Scheme *
- (28) Fibre Crops Dev. Scheme (Cotton, Jute & Mesta)

109- Extention & Training

- (02) Agril. Information Unit
- (03) Farmers Training Institute
- (05) Scheme on demonstration of liming
- (06) Basic Agril. Training Centre.

111- Agril. Economics & Statistics.

- (01) Land Use Survey & Agril. Statistics.

113- Agriculture Engeneering (Mechanical)

- (02) Agril. Engineering (Mech)
- (03) Agril. Engineering (Workshop)
- (04) Supply of power tillers & power pumps

- (10) Esstt. Of Farmers' Agro Service Centres (State share)
- (11) Setting up of Agril. Training Centre (State share)
- (12) Popularization of improved Agril. Implements
- (15) Employment generation for educated unemployment youth – creation of Agro Custom hiring centre at 50% subsidy to local youth.
- (16) Sinking of Shallow tube wells at Farmers' field

195-Assistance to Farming Co-operatives
(02) Corpus fund on Crop Insurance (RKBY)

800- Other Expenditure
(01) Acquisition of land
(02) Construction and maintenance of Deptt. Building
(03) Creation of Civil Engineering Cell under Agril. Engineering Wing *

B. 2216- Housing

(01) Government Residential Building
700 Other Housing (Furnishing)

C. 4216- Capital Outlay on Housing

(01) Government Residential Building

D. 4401- Capital Outlay on Crop Husbandry

800- Other expenditure
(01) Construction of Administrative Building

E. 2415- Agril. Research & Education

01- Crop Husbandry
004- Research
(04) Research
(05) Research Projects on Rice (State Share)

F. 4416- Investment in Agril. Financial Institution

190- Investment in Public Sector & Other Undertaking
(01) Share Capital contribution & Investment in Agril. Institution.

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- New Schemes w.e.f the 10th Five Year Plan