

CHAPTER IV

AGRICULTURAL DEVELOPMENT AND FIVE YEAR PLANS

Sikkim shrouded as it was in the mist of feudalism and isolated from the rest of the country, nothing significant was done for the planned development of agriculture until the early part of the twentieth century. It was the last Chhogyal late Palden Thendup Namgyal who realised the importance of agriculture and agricultural development for his kingdom in the fifties. He, therefore, co-ordinating with the Govt. of India initiated planned economic development in Sikkim in 1954⁽¹⁾.

Main features of Sikkim's Development Plans

The first plan of Sikkim is a seven-year plan starting from 1954 to 1961 with an outlay of Rs. 3.07 crores. This was followed by three five year plans, namely the Plans for 1961-66, 1966-71 and 1971-76. Sikkim became a part of the Indian Union on May 16, 1975 when the fourth Five-Year Plan in other states of the country was drawing to a close. The Fifth Plan, thus, started on 1.4.1976. It was expected to terminate in the year 1979 and consequently the Plan would have been only of a three-year duration. However, the Fifth Plan had to undergo changes in its duration in accordance with the changes effected in other states of the country when the Plan was terminated in 1978 and the Rolling Plans from

1978-83 were formulated. This was again modified and consequently the Plan from 1976-77 to 1979-80 was deemed to be the Fifth Plan which thus had a duration of four years for the state. After this, without any change the subsequent Plans are all of a five-year duration⁽²⁾.

Methods of financing the Development Plans

All the development plans in Sikkim have so far, been implemented through 100% central assistance. Until the Fifth Plan, the assistance from the centre was entirely in the form of grants. From the beginning of the Fifth Plan, that is from 1976, this pattern of assistance has been modified and 10% of assistance has been treated as loan. This practice of grant and loan has been in vogue.

The grant of central assistance in Sikkim is not governed by the "Gadgil Formula". Accordingly the provision of funds for implementation of plan schemes has been on the basis of detailed planning exercises undertaken at the state level and discussed and settled by the working group in the Planning Commission⁽³⁾.

The state has, so far, not gone into the market for borrowing. Indications are that the system of market borrowing will not be extended to the state for some more years. Similarly, the public undertakings which are few in number, are also not expected to go into the market. As far as loans from the International Agencies are concerned, it is the Life Insurance Corporation from which loans are drawn. Loans from L.I.C. are utilised for the purpose

of the rental housing scheme of the Government.

Loans drawn from other sources are the H.U.D.C.O. and it is drawn through the Agencies of State Housing Board and Gangtok Municipal Corporation. A few other Institutional Financing Agencies are Agricultural Refinancing and Development Corporation, the Industrial Development Bank of India etc. However except the loan from L.I.C., the other loans are not treated as Plan resources for the state ⁽⁴⁾.

Allocation of Fund for Agricultural Sector
in different Plan periods

The details of First Seven-Year Plan

Investment on agriculture and horticulture are presented in the following table 4.1

Table 4.1

A) Agriculture Development Plan -

<u>Schemes</u>	<u>Funds allocated</u>
1. Demonstration Farm at Gangtok	Rs. 5,41,449/-
2. Demonstration Farm at La-chung	Rs. 11,482/-
3. Seed Certification Farm, W. District	Rs. 73,452/-
4. Cardamom Installation of an Entomological and Pest Control Lab.	Rs. 1,849/-
5. Training	Rs. 14,040/-
6. Agriculture Loans	Rs. 49,209/-
7. Agriculture Information Service, Staff, Equipment	Rs. 5,000/-
8. Acquisition of lands for cardamom nurseries	Rs. 2,349/-
9. Fair Price shops	Rs. 2,04,198/-
10. National Extention Service Organisation	Rs. 3,96,955/-
Total	Rs. 12,99,983/-

Table 4.1 (Contd..)

B) Horticulture Development

<u>Schemes</u>	<u>Total Expenditures</u>
1. Staff quarters	Rs. 34,613/-
2. Pay of staff etc.	Rs. 81,262/-
3. Cost of equipment, seeds, fertilisers insecticides, etc.	Rs. 2,393/-
4. Rent of store godowns for manures	Rs. 300/-
5. Loans to fruit growers	Rs. 7,05,224/-
6. Training	Rs. 25,221/-
7. Fruit Preservation and canning factory	Rs. 74,760/-
8. Horticultural Nursery	Rs. 25,221/-
9. Plant Protection cum horticultural mobile team	Rs. 94,760/-
Total :	Rs. 11,20,075/-

Allocation of Fund for Agricultural Development in the
Second Five Year Plan, 1961-66.

During the Second Plan period 1961-66 the outlay earmarked for agricultural sector was Rs. 45.56 lakhs. Scheme wise this amount had been distributed in the following manner shown in Table 4.2.

Table 4.2

Schemes	Amount (in lakhs)
1. Strengthening of the Deptt.	4.14
2. I.C.A.R. Schemes transferred to Plan	4.12
3. Extension Service	2.48
4. Plant Protection Centres	4.48
5. Training of Personnel	0.65
6. Agriculture farm cum nursery at La-chung	2.86
7. Potato farm at Ribdi	3.43
8. Fruit and Cardamom Nursery, Mangan	0.61
9. Sub-Tropical Nursery at 9th Mile	0.92
10. Temperate fruit Nursery	0.49
11. Buildings I.C.A.R.	1.94
12. Apple Orchards, La-chung	0.44
13. Agriculture Loans	6.00
Total :	Rs. 45.56 lakhs

Allocation of Fund for Agricultural Sector in the
Third Five-Year Plan, 1966-71

The outlay for developing agricultural sector in the
Third Five Year Plan was Rs. 61.41 lakhs. The outlay spent on
various schemes are shown in the following Table 4.3.

Table 4.3

Schemes	Amount allocated (in lakhs.)
1. Supply of Inputs-fertilisers, insecticides and seeds	13.75
2. Seed Multiplication	5.10
3. Development of cardamom	0.69
4. Development of Potato	6.21
5. Development of horticulture	2.78
6. Plant Protection	5.00
7. Intensive Agriculture Programme	9.00
8. Agriculture credit	6.00
9. Extension Services	3.10
10. Development of Land	6.00
11. Soil Survey	2.00
12. Exhibition of crop competition	0.85
Total:	Rs. 61.41

Allocation of Fund for Agriculture Sector in the
Fourth Five-Year Plan, 1971-76

The Fourth Five Year Plan received Rs. 96.34 lakhs for the development of agriculture. The fund allocated on various schemes are presented in the following Table 4.4

Table 4.4

Schemes	Amount spent (in lakhs)
1. Agriculture Inputs	57.49
2. Extension services	22.20
3. Govt. Farm facilities	1.73
4. Intensive seed potato production	1.00
5. Development of horticulture	4.50
6. Food production promotion	3.00
7. Agriculture credit	5.00
8. Land Development	2.50 (8)
Total	Rs. 96.34 lakhs

Fifth Five-Year Plan and allocation of fund for
Agriculture Sector, 1976-80

The fund of Rs. 801.00 lakhs earmarked for the Agriculture Sector had been spent in the following way-

Table 4.5

Schemes	Amount spent
1. Crop production	207.54
2. Manures and fertilisers	91.70
3. High yielding varieties	37.50
4. Plant protection	75.28
5. Mechanisation	35.19
6. Extension of farmers	42.28
7. Research and education	46.88
8. Agriculture Economics and Statistics	3.55
9. Centrally sponsored schemes	43.90
10. Direction & Administration	138.83
11. Plantation crops	78.35 (9)
Total :	Rs. 801.00 lakhs

In the Sixth Five-Year Plan the outlay of Rs. 31.14 crores earmarked for Agricultural Sector had been spent on the following programmes-

- 1) Seed Production of high yielding varieties
- 2) Development of commercial and plantation crops
- 3) Agricultural inputs-manures and fertilisers, pesticides and insecticides.
- 4) Soil testing
- 5) Agricultural research
- 6) Provision for extension services and farmer's training.
- 7) Organisational structure of Agriculture Department.

The Seventh Five-Year Plan 1985-90 formulated with the basic objective to achieve substantial increase in agricultural production. The outlay earmarked for the agricultural sector in the Seventh Five-Year Plan was Rs. 48.50 crores. The respective shares of each of the sub-sectoral items vis-a-vis the total sectoral outlay may be seen in the following table 4.6.

Table 4.6

Head of Development Agriculture and Allied services	Seventh Plan approved outlay (Rs. in lakhs)	% share to total outlay
1. Crop Husbandry	14.04	29.00
2. Soil and water conservation	10.00	21.00
3. Animal Husbandry	9.31	19.00
4. Dairy Development	0.75	1.05
5. Fisheries	1.20	2.04
6. Forestry and wild life	9.50	19.05
7. Storage and ware housing	0.45	0.09
8. Agricultural research and education	0.65	1.04
9. Marketing, quality control	0.60	1.02
10. Co-operation	2.00	4.01 (10)
Total	48.50 lakhs	100

Measures taken for agricultural development in
different Plan Periods

The process of planned economic development in Sikkim was initiated when a Seven-Year Plan (1951-61) was formulated. Under the Seven-Year Plan, first a separate Department of Agriculture was started with Dr. K.L. Narasingham as the Director of Agriculture and Animal Husbandry⁽¹¹⁾. Later on, in 1974 a separate department for Animal Husbandry was created with Dr. R.C. Khera as its Director⁽¹²⁾.

A wide range of agricultural programmes had been implemented during the First, Second, Third and Fourth Plan Periods with a view to increase agricultural production. Various programmes such as setting up of demonstration farms, seed certification farms, nurseries, minor irrigation, land reclamation and development, distribution of seeds, pesticides, fertilisers, agricultural implements, adoption of scientific methods of cultivation, research and education were undertaken. At the initial stages, the Agriculture Department itself distributed fertilisers, insecticides to farmers on subsidised basis. From the Fourth Plan onward, the Panchayats had been actively associated in the distribution programme and storage of fertilisers, pesticides and seeds. Extension service in the field of agricultural development was made fully operative in the Third Five-Year Plan with the appointment of one Deputy Director of Agriculture Extension, four Extension Officers, two Plant Protection Officers, two specialists on the subject matter, one for cash-crop production and another for food crop production and a number of Village Level Workers (V.L.Ws). A soil Survey Project was also undertaken to carry out soil testing of various locations with a view of directing farmers in the utilisation of fertilisers⁽¹³⁾.

The process of agricultural development in the state commenced in the true sense of the term only from the year 1976-77, that is, with the inception of the Fifth Five Year Plan. Previous to this Plan, agricultural development planning was haphazard and contained a series of 'ad hoc' measures. From the

beginning of the Fifth Plan an attempt was made to tackle the problem in a more scientific way based on the recommendations of a Team of Experts headed by Mr. B. Shivaraman. One such recommendation was that the state should be divided into various eco-geographical regions and in each of the regions adaptive trials of various crops should be concluded so as to evolve the most suitable crop variety for the particular region.

The state has been divided into four districts for administrative purpose, viz. District East with its headquarter at Gangtok, District West at Gyalshing, District North at Mangan and District South at Namchi. As per the recommendations of the Team of Experts, the state has been divided into nine regions with five sub-centres and 105 V.L.W. circles for agricultural development purposes⁽¹⁴⁾. They are as follows-

<u>District</u>	<u>Region</u>	<u>Sub-Region</u>	<u>V.L.W. Centres</u>
1. East	(1) Nazitam	(1) Marchak	Ranipool, Ranka, Tadong, Middle Camp, Rumtek, Sichey Busty, Gaucharan, Martam Nazitam, Sang, Sihak, Lingzey, Lower Khamdong, Upper Khamdong, Ragdontintek, Samdong, Lower Samdong, Lingtek, Burten, Pendong.
	(2) Pakyong		Lingtam, Rongli, Rhenok, Mamring, Rorathang, Thekabong, Pakyong, Padamchey, Panchey Khani, Aritar, Machung, Barapathing
	(3) Majitar		Durga, Central Pandam, Sirwani, Majitar, Ralep, West Pandam, Sumin.

<u>District</u>	<u>Region</u>	<u>Sub-Region</u>	<u>V. L. W. Centres</u>
2. West	(4) Gyalshing		Kaluk, Bermiok, Hee, Dentam, Utterey, Sardong, Lingchaom, Pelling, Darap, Thingling, Yoksom, Gerething, Tashiding, Sakyong, Gyalshing, Legship, Reshi, Takuthong, Pipaley.
	(5) Hilley	(2) Daramdim	Sirbadam, Soreng, Timberbong, Chakung, Burikhop, Zoom, Chumbong, Budang, Malbasey, Tharpu, Daramdim, Sombaria, Tikpur, Okharey, Ribdi.
3. South	(6) Namchi	(3) Namthang	Namchi, Nandugaon, Kitam, Hikhola, Maniram, Salghari, Vok, Tinkitam, Sumbuk, Damthong Rateypani, Sodam, Mellidanra.
	(7) Tokal Bermiok		Tokal Bermiok, Tarku, Rabhangla, Yangang, Kewzing, Lingmu, Lingipayong.
4. North	(8) Mangan	(4) Dzongu	Mangan, Kabi, Namok, Phodong, Phensong, Dickchu Hee Gyathang, Lingtham, Tingbong, Naga
	(9) La-chung	(5) La-chen	La-chung, La-chen, (15) Chungthang

These centres serve as the focal point of developmental activity. The technologist of each centre studies the production problem of each area and find out the solutions through experimentation in the Regional Farms and help the farmers in solving their problems by providing improved technology, such as designing cultural practices and right type of fertilisers, soil amendments pesticides and motivating them with demonstrations, training and holding males or exhibitions.

A large number of different varieties of crops are collected, experimented for adoption and best ones are quickly multiplied in the Regional Farms and distributed to farmers through V.L.W. Centres located at different places of each region in the rural areas. These Regional Centres and sub-centres are properly guided by technologists in the District and Directorate in their various works. V.L.W. Centres are provided in the midst of 3 to 4 villages from where production technology and improved seeds, fertilisers, pesticides and other inputs are made available to farmers⁽¹⁶⁾.

Since proper land utilisation is an essential pre-requisite for attaining the required production level, the available land has been divided into-

1. Irrigated areas
2. Rainfed areas
3. Degraded areas

In irrigated and rain-fed areas various programmes have been set up. In degraded areas, the main degradation in the soil is due to high acidity content. This is a common problem in the hills where rainfall is high and soil erosion is intense. Experiments undertaken during the Fifth Five Year Plan have revealed that the deficiency in the soil can be corrected to a large extent by lime application. Such degraded areas could be used, if not for crop production, for cultivation of fodder or mulberry or any other suitable crop.

Keeping in mind the optimum utilisation of land, in the irrigated areas, the system of multiple cropping has been practised. Regional Centres work out suitable crop rotation systems which are extended by the V.L.Ws to the fields systematically. In rain-fed areas also multiple cropping has been attempted by a combination of crops, such as paddy and maize with wheat and mustard, or paddy with vegetables and so on. Under horticulture, the main emphasis during the Plan period has been to develop more progeny orchards so that the planting materials suitable for agro-climatic regions of the state are available within the state. Three more progeny centres had been set up during the Fifth Plan. Further, the areas above 7,000 ft. in altitude have been found to be ideally suitable for growing disease-free potato seeds. During the Plan periods, therefore, a number of orchards and seed-potato farms have been set up.

To reduce the loss in production on account of pest-attack, a separate Plant Protection Wing had been set up by the Department. In each district four mobile Plant Protection Units are conducting prophylactic sprayings and surveillance work.

For undertaking research and education, an I.C.A.R. Research Complex has already been established in Sikkim. The Research Centre studies various agricultural problems of the state. The research programmes of the state are restricted to adaptive trials, soil testing, soil reclamation, water conservation and micro-nutrients trials. For soil testing, a full-fledged laboratory has been set up. Soil samples are being analysed for detecting the deficiency of the soil.

To help farmers market their vegetable produce, the Agriculture Department during the Fifth Plan formed "Growers Associations" in three selected regions and for collection, processing and transport of their produce to the main transport of their produce to the main markets in Gangtok the department provides necessary assistance to the growers.

During the planned period, previous to the Fifth Five Year Plan, no adequate and accurate field data were available. Without regular supply of such data at the required interval it had not been possible for the Department to keep pace with the trends. This defect has been removed in the Fifth Plan by establishing a full-fledged Statistical Wing known as the State Statistical Bureau. It now provides the department with a regular supply of the required data thereby enabling it to tackle the problems in time⁽¹⁷⁾.

The performance and achievements of the Seventh Five-Year Plan in agricultural sector

The Seventh Five Year Plan aimed at bringing about socio-economic development of the state as a whole based on economic needs, environmental consideration and aspiration of the people. The achievements made during the Seventh Plan period in the various fields are enumerated below:

1. Production of food grainsTable 4.7

Seventh Five Year Plan 1985-90

Programme	Target	Achievements
1. Production of food (In 1000 items)		
a) Cereals	112.00	113.00
b) Pulses	16.00	14.00
c) Oil seeds	16.00	13.50
d) Vegetables	30.00	34.00
e) Fruits	24.08	24.00
f) Large Cardamom	4.50	3.80
g) Potato	30.00	34.10
h) Ginger	15.00	15.10
i) Other commercial crops	2.55	2.50
2. Area under high yielding varieties (1000 hectares)	42.00	48.00
3. Seed Production (tonnes)	3,970	4150
4. Seed Distribution (tonnes)	1920	2000
5. Planting materials (In lakhs)		
a) Production	4.75	4.50
b) Distribution	5.0	5.20

Programmes	Target	Achievements
6. Consumption of fertilisers (Nutrients in tonnes)	3000	3000
7. Consumption of pesticides	35.00	32.00
8. Consumption of liming materials	800	800
9. Infrastructure Development		
i) Regional Centres	12	11
ii) Regional sub-centres	15	14
iii) Cardamom Research Farm	1	1
iv) Dry land Research Farm	1	1
v) Floriculture Farm	1	1
vi) Soil Testing Laboratory	-	-
vii) Seed Testing Laboratory	-	-
viii) Plant Protection Laboratory	4	2
ix) Mushroom Spawn Laboratory	1	1
x) Agriculture Engineering workshop	-	-
xi) Agro Service Centres	8	8
xii) Demonstration Farm	23	16
xiii) Training Institute	-	-
xiv) V.L.W. Centres	153	128
xv) Storage Godown	30	30
xvi) Tissue Culture Laboratory	1	1 (18)

From the above Table, it is evident that the Seventh Five Year Plan has made significant progress in all directions, particularly in creating infrastructure for such development as production of seeds and planting materials, production of cash and commercial crops, area coverage under high yielding varieties and

uptake of fertilisers and pesticides. Over the years there has been considerable shift in land-use programmes with more concentration on cash and commercial crop and enhancing foodgrain production at substantial level.

In addition to this, the Department of Agriculture has been able to gear up adaptive research resulting into release of a large number of high yielding or improved varieties of all crops suited to varied agro-climates with appropriate production technologies.

2. Agricultural Research and Education

A. Agricultural Research -

During the Seventh Five Year Plan a large number of high yielding varieties of different crops suited to specific agro-climate has been identified and their cultivation promoted. Three centres have been established for carrying out adaptive research on large cardamom, flowers and rain-fed agriculture. The possibility of growing non-traditional crops like arhar, sunflower and spices have been explored through extensive trials and the outcome has been encouraging. The farmers have started growing arhars and in case of sunflower minikit trials and demonstrations have been undertaken. The state Department of Agriculture has also been working in close co-ordination with I.C.A.R. Research Complex and Spices Board to solve specific problems associated with crops like large Cardamom, Ginger, Orange, Vegetables, Potato, etc.

Target and Achievements of Seventh Plan on
Agricultural Research

Table 4.8

Seventh Plan 1985-90

Varietal Screening Programme	Target	Achievement
1. Varietal screening and breeding, selection, adoption, trials, etc. on cereals, pulses, oilseeds, vegetables, fruits, commercial crop, tubers, rhizomatic crops and spices crops	300	380
2. Fertilisers (Major & Micro Nutrients) Response trials		
i) <u>Cereals</u> - Maize, paddy, wheat millet, buckwheat, barley etc.	250	300
ii) <u>Pulses</u> - Urad, moong, rajmah, rice, bean, cowpea, lentil etc.	20	50
iii) Rape, Mustard, soyabean, sunflower, sesame safflower etc.	10	45
iv) <u>Vegetables</u> - cabbage, cauli-flower, raddish, potato, beans, tomatoes, bindi, leafy vegetables	50	250
v) <u>Fruits</u> - orange, lime, lemon, guava, Banana, temperate fruits, etc.	20	45
vi) <u>Commercial crops</u> -		
a) Large Cardamom	2	10
b) Ginger	5	10
c) Potato	5	10
vii) <u>Other tuber and rhizomatic crops</u> turmeric, sweet potato, tapioca, etc.	5	10
viii) <u>Spices and condiments crops</u> chillies, onion, garlic, coriander etc.	5	8

Varietal Screening Programm	Target	Achievement
3. <u>Adaptive trials on agronomic practice</u> Agronomic trials including spacing, seed size, seed rate, date of sowing, crop economic crop rotation, plant population density	400	475
4. <u>Pesticidal Trials</u> Efficiency trials of fungicide, insecticides, rodenticides, weedicides, nematicides etc.	5	10
5. <u>Medicinal Plant</u> Research Centres	-	-
6. Construction of green house	-	-
7. Minikit trials	1,600	1,500
Total	2,577	3,103

B. Agricultural Education

The objective of this programme is to develop technically qualified and competent personnel at various levels through in service trainings both within and outside the state. This scheme also provides opportunities to officers and field functionaries to pursue higher studies. One composite Training Institute has been functioning in the state to impart training to V.L.Ws and agriculture inspectors.

The programmes undertaken during the Seventh plan under agriculture education are as follows:

Table 4.9

Seventh Five Year Plan

Programmes	Target	Achievement
1. Establishment of composite training Institute	1	1
2. Post graduate courses	10	10
3. Graduate courses	10	10
4. Diploma course	75	67
5. Gram Sevak Diploma	100	59
6. Short courses	-	36
7. Seminars and workshops	10	15
8. Establishment of libraries	1	-
9. Educational tours (Each with ten persons)	-	- (19)

3. Multiplication and Distribution of seeds

Considerable efforts have been made to streamline seed development programme and to reach improved seeds to the farmers. The seeds Act of 1966 has been enforced with effect from May 8, 1987 and a small unit of seed processing is being commissioned. Good progress has been made in increasing seed production during the Seventh Five Year Plan period. The details of seed production in the Government farms for the last five years are as follows:

Table 4.10

Item	Govt. Farm seed production in Quintals				
	1985-86	1986-87	1987-88	1988-89	1989-90
1. Cereals	1021	1210	1032	1136	1325
2. Pulses	19	82	40	74	200
3. Oilseeds	12	98	64	73	150
4. Potato	1842	2020	1831	2181	3500
5. Ginger	175	142	196	254	300
6. Vegetables	38	54	53	53	100
7. Others	13	203	149	194	170
	3190	3809	3365	3970	5745

The details of achievements made under the seed production programme in the farmers' field for the last five years are presented in the following table:

Table 4.11

Items	Farmer's field seed production in quintals				
	1985-86	1986-87	1987-88	1988-89	1989-90
1. Cereals	490	667	949	1045	1375
2. Pulses	304	310	265	363	400
3. Oil seeds	58	68	196	360	450
4. Potato	20800	23800	26450	28000	30500
5. Ginger	-	1000	2000	2400	2700
6. Vegetables	164	267	262	341	200
7. Others	-	-	50	21	130
	21,816	26,012	30,182	32,530	35,755

3. Manures and fertilisers

For consumption of fertilisers the Seventh Plan had a target of 2000 tonnes of Nitrogen, 800 tonnes of Phosphorus and 200 tonnes of Potash. Out of this target 1700 tonnes of Nitrogen, 950 tonnes of Phosphorus and 350 tonnes of Potash has been achieved with construction of 5000 compost pits.

4. High yielding varieties programme

Under this programme 48,000 hectares of area covered during the 7th Plan under rice, wheat and maize crops, Minikit trials of 0.10 hectare size each, was conducted in giving 20,000 minikits to the farmers during the Seventh Plan.

5. Commercial crops

- 1) Potato — A new potato farm has been opened at Sipger, Dzongu area. 3050 tonnes of certified seed has been produced in the farmers' fields and 850 tonnes of seed potato was distributed to the farmers, 40 tonnes of breeder seed was procured from Kuprik and multiplied in the governmental farm. A total of 34,000 tonnes of Potato production was achieved within the Seventh Plan Period (21).

- ii) Mushroom Development - This included creation of basic infrastructure and initiation of promotional measures during Seventh Plan period. One mushroom spawn complex has been established and efforts are on to propagate its cultivation in the rural areas by organising training programme and conducting demonstrations. The mushroom spawn complex is started at Marchak .
- iii) Large Cardamom - One cardamom research farm has been established in Kabi, North Sikkim. Two lakhs of cardamom seedlings have been propagated in the government farm during the Seventh Plan. 130 improved cardamom curing houses are also constructed in the farmer's fields.
- iv) Ginger - 220 tonnes of Giner seed are distributed to the farmers and for 100 hectares of the ginger cultivation subsidy is granted.

6. Plant Protection

Under this programme, 35 tonnes of technical grade materials of pesticides was targetted in the final year of the Seventh Plan out of which 32 tonnes have been achieved with an area coverage of 57,600 hectares. Two plant protection laboratories, one at Gyalshing and another at Namchi have been established.

7. Extension and Training

With two Farming Training Centres stationed at Gyalshing and Gangtok 21,340 farmers have been trained in the advance technology of different crop production in Sikkim. Two documentary films - one on large organised and 300 lakhs leaflets and booklets on improved method of crop cultivation were distributed to the farmers for their reference. A total number of 2,865 demonstrations on various crops were conducted during the Seventh Plan.

8. Agricultural Engineering

Under this programme 23,200 hand tools, 19500 horticultural tools, 1800 implements have been distributed to the farmers for their farm use. 11,000 hand tools and implements were manufactured in the departmental workshop and distributed to the farmers. Four agro service centres are also established during the Seventh Plan period.

9. Agriculture Economics and Statistics

Under this programme, 5000 crop cutting experiments have been conducted to assess the productivity and production of various crops. On survey of area on various crops all over Sikkim is also conducted and the data recorded are being analysed at the final stage.

10. Dry land Development

Dry land areas in Sikkim are not only highly unstable due to climatic uncertainty and erratic distribution of rainfall. For evolving improved technology on soil and water conservation and promotional measures to improve productivity and socio-economic conditions of the dry areas in South, West and East Districts. A Dryland Development Scheme has been executed during the Seventh Plan. Twenty selected watersheds have been covered by providing 175 water storage structures covering 1,320 hectares of land by terracing.

11. Horticulture

In the Seventh Plan considerable progress has been made in the development of horticulture particularly in production of planting materials, increase in area of fruit plantation, establishments of progeny orchards and nurseries. Twenty five lakhs of planting materials have been distributed during the Seventh Plan Period. 250 hectares are replanted and 5 progeny orchards have been established 5000 hectares of areas have been covered by vegetable production. Under floriculture, one floriculture farm is established and 3,50,000 planting materials of flowers are propagated.

3. Storage and Warehousing

In the Seventh Plan, 10,000 metric tonnes storage capacity was the target to be created. To achieve this target, 5 imput-stores and 17 rural godowns have been completed.

4. Agriculture Marketing and Quality Control

In the field of marketing of farm products, the rate of Agriculture Department has been more of supportive promotional nature. 1550 metric tonnes of vegetables, 1,200 metric tonnes of off-season cabbage, 400 metric tonnes of table potato, 1,440 metric tonnes of seed potato have been marketed in this promotional marketing programme.

5. Soil and Water Conservation on Agriculture Land

3,000 acres of land are improved by adopting soil conservation scheme.

The soil survey and resources mapping have been completed in collaboration with N.B.S.S.L.U.P., Nagpur. Under the soil testing service, a mobile soil testing van has been purchased and with the help of this van 40,000 samples of soil have been analysed during the Seventh Five Year Plan (22).

Agricultural Development in La-Chen and La-Chung under the
Five Year Plans

Because of geo-physical and climatic conditions, agriculture in the valleys of La-Chen and La-Chung situated at an altitude of 8960 ft. and 8610 ft respectively is different from the rest of the state.

Under the planned development process for developing agriculture one Regional Centre at La-Chung and another Sub-Regional Centre at La-Chen have been set up by the government, besides establishing an Agriculture Farm-cum-Nursery at La-Chen and Apple Orchard and Seed Potato Farm at La-Chung⁽²³⁾. Each Regional Centre has been suggested by the Team of Experts to conduct adaptive trials of various crops so as to evolve the most suitable crop variety for the particular region. As a result of such trials, La-Chung and La-Chen have been found to possess tremendous potentiality for a producing off-season vegetables in the month of July and August. This is advantageous for the farmers in the sense that they are able to get better prices for their produce during this peak price season since the vegetable production in the lower plains becomes non-profitable at this moment on account of unfavourable weather condition.

Among off-season vegetables, mainly cabbage, radish and peas are grown in La-Chung and La-Chen. During 1984-85 in the month of July and August these two valleys alone produced 200 M. tonnes of cabbage. The entire produce was channelised to Gangtok and Siliguri⁽²⁴⁾.

As a result of planned economic development, agriculture is well established in Sikkim as compared to other hilly states of the country. Evidently the practice of mono cropping has been changed to double cropping and triple cropping by relay cropping, or multiple cropping, or mixed farming, irrespective of elevation and agro-climatic adverses. With the introduction of short duration, photo-insensitive and high yielding varieties of paddy, maize, dwarf wheat etc., production has certainly gone up, but unfortunately not to make the hilly state still self-sufficient in food grains (25).

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