

Chapter 8



FARM RESOURCES

Sikkim has basically an agrarian economy and predominantly rural population (about 90% of total population) and two-third of the overall work force depending on agriculture and allied activities, with only 16% of geographical area available for cultivation. About 40% of GDP is being contributed from this sector. Most of the agricultural land is upto 1800 meter elevation although certain portion of it extends even upto 8600 meter elevation. Even though agriculture is crucial to the economy of the state, it is largely rainfed with traditional technology and low level of inputs. Although rainfall in the state is quite high, but due to inadequate effort in harnessing the available resource, the area under irrigation is hardly around 11% of the operational area. Assured irrigation is even less than 5%. State is practically mono-cropped with kharif cultivation and for want of assured irrigation, multi-cropping has not been attempted. Level of productivity is low as compared to the national average. These are main factors attributable to the fact that the state has not reached a stage of self-sufficiency even though the population is only about Rs.5.40 lakh (2001 census)

Before merger of this state in the Union of India in 1975, the agriculture sector was characterized by uncertainty about land tenure rights, negligible public investment and over-dependence. This sector has recorded considerable progress during the last two decades. In the past, low productivity with negligible marketable surplus and other institutional inadequacies, led to agricultural backwardness. Some of the specific reasons responsible for agricultural backwardness in Sikkim till 1975 were:

- Physical features of the state, necessitating terrace cultivation
- Extreme concentration in land-holding patterns
- Low cropping intensity due to mono-cropping
- Outmoded technologies of production
- Inadequate thrust on agriculture in terms of investment and planning
- Inadequate infrastructural support in transportation, communication, irrigation, technical research and marketing.

(Unit : th ha)

In the post merger period, the strategy was to provide a package of services aimed at consolidating peasant economy. This covered land reforms, agricultural credit and marketing, provision of inputs like seeds, fertilizers, minor irrigation, and encouragement to horticulture and cash crops. Thus, despite the limited cultivable land in Sikkim, agricultural development has made considerable progress during the last two decades.

Table 8.1 District-wise area under principal crops during 1999- 2000 and 2002-03

Crop	District				State
	North	South	East	West	
Maize	3.09/3.03	13.30/13.40	9.70/9.54	13.30/13.47	39.39/39.44
Rice	1.41/0.85	2.40/2.34	6.72/6.50	5.38/5.10	15.91/14.79
Wheat	1.04/0.85	1.96/1.50	2.55/1.98	2.55/2.0	8.10/6.33
Barley	0.15/0.14	0.20/0.20	0.34/0.44	0.45/0.45	1.14/1.23
Pulses	0.08	2.25	1.74	2.54	6.71

Source: Department of Agriculture, Government of Sikkim

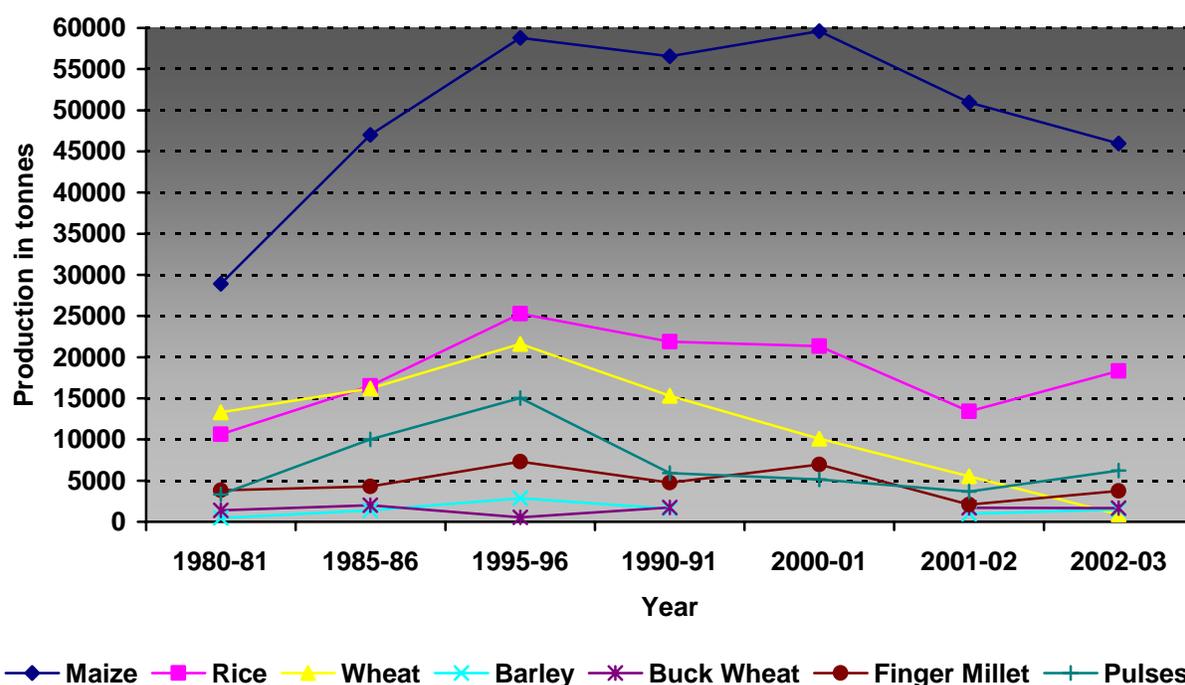
AGRICULTURE PRODUCTION AND YIELD

(Unit: tonnes)

Table 8.2 Food production in Sikkim (1980-03)

Crops	1980-81	1985-86	1995-96	1990-91	2000-01	2001-02	2002-03
Maize	28930	47000	58810	56560	59610	50940	45960
Rice	10630	16500	25300	21880	21350	13420	18330
Wheat	13310	16200	21600	15300	10100	5520	870
Barley	460	1400	2860	1570	-	970	1495
Buck Wheat	1380	2000	540	1740	-	1690	1655
Finger Millet	3840	4300	7310	4750	6970	2090	3740
Pulses	3320	10010	15020	5920	5160	3660	6230
Total (cereal+pulses)	61870	97410	133440	107720	103190	78290	86250

Source: Department of Agriculture, Government of Sikkim

Fig 8.1 Food production in Sikkim (1980-03)


Source: Department of Agriculture, Government of Sikkim

✦ HORTICULTURE

The state being hilly has limited scope of industrial growth, and hence has not adequately succeeded in decreasing the pressure on agriculture/horticulture as the agrarian population has decreased at minimal since its merger in the Indian Union (1975). The contribution of horticulture to the state's domestic product may be quite significant and therefore this sector shall receive priority attention for higher levels of rural prosperity. Horticulture includes varieties of fruits, vegetables, root and tuber crops, mushroom, honey, nuts, spice crops like large cardamom, ginger, turmeric, seed spices, medicinal and aromatic plants etc. The sector has established its importance in improving land use, promoting crop diversification, generating employment and above all providing nutritional security to the people. Horticulture also encompasses every aspect of aesthetics, economics and environmental regeneration. Horticulture production, including fruits, vegetables, potatoes, other tubers, cardamom, ginger and turmeric, has increased substantively between 1975-76 and 1999-2000 as shown under.

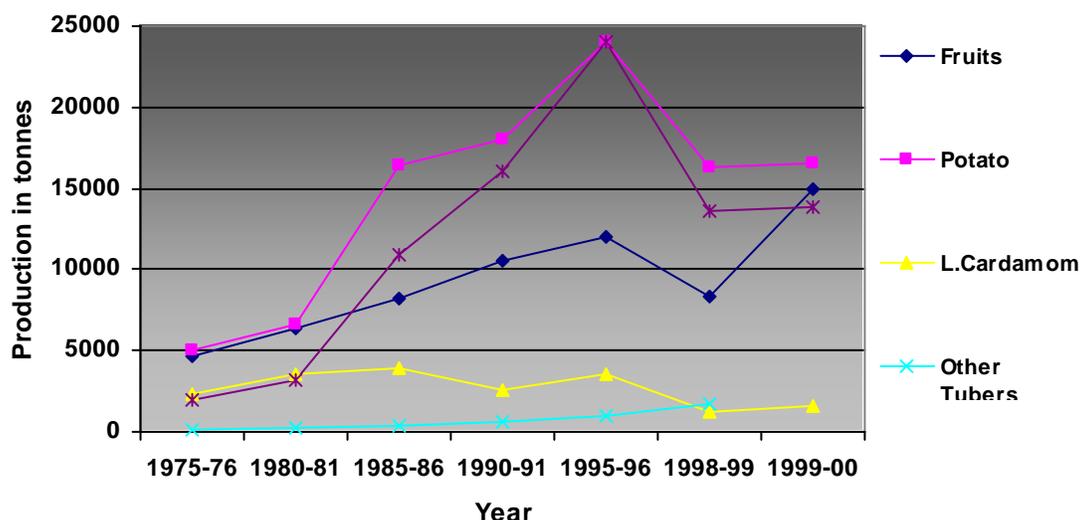
(Unit: tonne)

Table 8.3 Horticulture Production in Sikkim from 1975-76 to 1999-2000

Sl. No	Crops	1975-76	1980-81	1985-86	1990-91	1995-96	1998-99	1999-00
1	Fruits	4700	6350	8200	10500	12000	8337	14916
2	Potato	5000	6646	16400	18000	24000	16274	16555
3	L. Cardamom	2300	3500	3900	2600	3600	1283	1925
4	Other tubers(Potato, Yams)	100	200	400	600	1000	1740	
5	Ginger	2000	3200	10900	16000	24000	13629	13842
	Total	14000	19696	39400	47100	63600	41263	47238

Source: Department of Horticulture, Government of Sikkim

Fig 8.2 Horticulture Production in Sikkim from 1975-76 to 1999-2000



Source: Department of Horticulture, Government of Sikkim

The impact of horticulture on the livelihoods of people has, therefore, been substantial, although concerns about sustainability of development of horticulture shall be addressed in realistic manner taking cognizance of the prevailing eco-system of the state.

■ FLORICULTURE

Besides the investment for infrastructure, promotional activity in floriculture in Sikkim shall be strengthened with adequate budgetary input. Flowers are perishable and need special arrangements for transport and marketing as the consumer centers are located in far off places. The state does not have quality planting materials for large scale production. There is no check on outflow of planting materials, and much of the quality materials produced in the state find their way to West Bengal and north eastern states. Multiplication through conventional method is very slow due to limited resources, and tissue culture laboratories in both public and private sectors are still unable to meet the requirements.

Floriculture has a tremendous potential but the state has yet to see break through. During the IXth Plan, the activity was limited to introduction of commercial varieties of flowers and multiplication in Government farms and farmers field. The scheme envisages to address introduction of commercial flowers, multiplication, cooperative marketing through wholesale markets and export through formation of Agri-Export Zones in Sikkim. For this two entrepreneurs for Agri-Export Zone formation have been identified for Cymbidium and Carnation. They have initiated the work at Pakyong. The priority flowers are in order of cymbidium orchids, Carnation, Anthuriurn, Gladioli, Lillium, tropical orchids etc.

Production Technology up-gradation through demonstration for cut flower production, providing technology of pre and post harvest and providing working facility to the field workers in the districts is essential and has been proposed in this Plan. The tenth plan target of cut flower production and Plants/Bulbs has been fixed to 15 lakh and 18 lakh, and Annual Target was 11 lakh and 13.2 lakh respectively, which has been anticipated to achieve. Annual Target for 2003-04 for cut flower production and planting material has been proposed to 12.1 lakh and 14.5 lakh respectively.

■ BEEKEEPING

Honey bees are known for honey as well as an effective pollinizer of crops and are known to increase crop production. Most of the horticultural crops such as large cardamom, many kinds of vegetables are cross, pollinated crops. In such crops pollination is done by the bees. Under this scheme, nucleus beekeeping centre will be established in one Government farm and improved bee species will be introduced for colony multiplication and distribution to the horticulture crop growers.

■ ANIMAL HUSBANDRY

In order to increase the productivity of various types of livestock, it is essential to have a sound network of veterinary hospital, dispensaries and stockman centre to monitor and control different types of disease occurring in livestock and poultry. These hospitals should be provided with basic facilities for carrying out various disease investigation works in the district and also at the State level. Already some works in this respect has been done during the 9th Five Year Plan. However, further improvement of these laboratories is required. Apart from creating these facilities at the district level, these facilities should be made available to farmer within reasonable distance. This is essential to curb the outbreak of any infection and communicable disease. A proper disease reporting system and disease surveillance forms an important aspect of field veterinary care during the Annual Plan 2003-2004.

■ **Cattle Development Scheme**

This is an ongoing scheme and is envisaged to intensify the activities through package of measures to increase the productivity of the local animals through programme of upgrading the local stock with the use of better quality semen from proven sires. The conversion of Karfecter farm into the State Bull Rearing Farm would eventually serve as a nucleus farm for launching the Indo-Swiss Project on Cattle Development and fodder cultivation in Sikkim. Attempts are being made to produce sufficient numbers of superior quality bulls at Karfecter farm and allot them to inaccessible areas where transport of liquid nitrogen is not possible.

■ **Poultry Development**

Poultry farming is commercially viable and employment oriented activity aimed at perceptible improvement in the economic condition of the rural poor. It is imperative to encourage adoption of poultry as a supplementary activity which would contribute significantly towards improvement of the living standards of the rural population. Few years ago, the department has created infrastructure as Hatchery-cum Breeding farm of 5,000 layer and 10,000 broiler parent stock in Bermiok, south Sikkim in collaboration with M/s. Venkateshware Hatcheries Limited, Pune. During 2003-2004, it is proposed to establish eight poultrysocieties-two each in every district.

■ **Sheep and Wool Development**

Sheep rearing is a traditional activity amongst people inhabiting the alpine areas of the State whose subsidiary is the carpet and blanket weaving industry. Moreover, there is a growing demand for both mutton and wool in the State. Thrust is being given to strengthen the existing infrastructure and continues the ongoing schemes.

■ **Piggery Development**

Pig husbandry is a very popular and lucrative occupation amongst the local Sikkimese. The department has introduced 10 nos. of Durac breed of pigs which has been imported from Bhutan. The Department is in the process of introducing fast growing breed of pigs and accordingly 80 nos. of exotic Hampshire breed of pigs have been introduced in the state and more number of exotic pigs shall be introduced for crossbreeding purpose.

■ **Other Livestock Development**

A yak farm was established at Thangu in North Sikkim and in order to prevent in-breeding amongst the local yak population, 14 male yaks have been imported from Bhutan. The department has also established an Angora Rabbit Farm at Rabum in North Sikkim.

■ **Extension and Training**

To have a close interaction with the farmers and the department personnel as well as to familiarize them with the latest scientific advancement in the field of livestock raising, a separate extension and training cell has also been constituted. District level Extension and Training Cell is also envisaged to be opened shortly.

✦ Dairy Development

The Dairy Development programme in the East, West and South district is being implemented through Sikkim Milk Union Ltd. However, it has still not been able to be a self-sustaining organisation. For the last two decades, the organisation has not shown any progress especially in field of milk quality improvement, procurement and marketing.

Table 8.4 The Indigenous Breed in Sikkim

Species	Breeds in Sikkim
Caprine	Singhari
Ovine	Gharpala, Banpala
Bovine	Siri
Avian	Dumshi, Basti, Nangay
Porcine	Harrey
Canine	Tibetan Mastiff, Apso
Yak	Gargu

Soucre : Sikkim Milk Union, Govt. of Sikkim

✦ FISHERIES

Fisheries are an important area of economic activity. Farmers are encouraged to take up fish farming for economic growth and to generate self employment. Through this activity, they are able to produce much needed protein in their own ponds. Fisheries Department proposes to upgrade to maximum growth of the existing infrastructure. The main thrust is to be given to trout and carp and conservation of riverine fisheries during the tenth five year plan. During 2003 - 04, it is proposed to continue production of carp fish seed for distribution to farmers, production of trout seed for stocking in river and stress would be given on strengthening the conservation of riverine fishery in order to achieve a marginal growth rate in fish production. For fisheries development, several programs are under way in the state. Some of these are described as under:

Trout Fish Seed Production

Due to the establishment of five trout farms at different centres of the state, the proposal envisages production of trout seed for stocking at different resources of high altitude lakes and streams. The program also provides for the production of quality seed of rainbow trout for the distribution among farmers covered under Pilot Project under Cold Water Fisheries. Provision is also meant for the capital expenditure for maintenance of the old farms.

Carp and Cat Fish Seed Production

All carp farms of the state are maintained under this program. The seed of carp and cat fish are produced for the distribution among farmers. The maximum emphasis is given to the grass carp seed production. Rothak fish Farm acts as the main pillar for this purpose. Phase-wise construction of Fish Farm at Fourteenth Mile is envisaged under this program. Some of the old farms are also to be maintained for maximum yield under this provision.

Conservation of Riverine Fisheries

The above conservation program includes patrolling, repair of Fisheries guards quarters, etc. Major thrust is being given for conservation of riverine fishery.

Propagation of Mahaseer

To promote angling in Sikkim, the population of Mahaseer in the rivers is to be maintained through stocking in good number. The seeds are raised at Mahaseer Farm, Tenth Mile, South Sikkim.

Development of Inland Fisheries

This provision envisages the support to the farmers for the production of fish seed in the private sector. The research activity for the development of agriculture is also planned under this program.

Fish Farmers Development Agency (FFDA)

Through this agency, State Govt. is making efforts to popularize the fish farming among the farmers by giving them subsidy, training allowance and contingency expenditure. The physical and financial targets for fisheries development in Sikkim are given in Table 8.5 & 8.6 respectively. Physical targets and achievements during ninth plan and anticipate achievements during 2002-03 are also included the table below.

Table 8.5 Threatened Fresh Water Fishes of Sikkim

No	Species	Status
1	<i>Anguilla bengalensis</i>	EN
2	<i>Ompok bimaculatus</i>	EN
3	<i>Pseudeutropius atherinoides</i>	EN
4	<i>Puntius clavatus clavatus</i>	EN
5	<i>Anabas testudineus</i>	VU
6	<i>Bagarius bagarius</i>	VU
7	<i>Barbodes sarana</i>	VU
8	<i>Catla catla</i>	VU
9	<i>Cirrhinus reba</i>	VU
10	<i>Clarias batrachus</i>	VU
11	<i>Clupisoma garua</i>	VU
12	<i>Heteropneustes fossilis</i>	VU
13	<i>Labeo dero</i>	VU
14	<i>Mystus vittatus</i>	VU
15	<i>Nemacheilus multifasciatus</i>	VU
16	<i>Nemacheilus scaturigina</i>	VU
17	<i>Osteobrama cotio</i>	VU
18	<i>Puntius chola</i>	VU
19	<i>Schizothorax richardsonii</i>	VU

EN=Endangered; VU=Vulnerable

Source: Sikkim Wetland, SACON publication.