

HORTICULTURE DEVELOPMENT IN NEPAL—AN OVERVIEW

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ABSTRACT

In spite of the long history of kitchen gardening, the beginning of modern horticulture development was the establishment of 13 horticultural farms at different regions of the country in yearly sixties. Progeny orchards were established at the government horticulture farms since then. Citrus and potatoes were recognized as nationally important commodities in 1972. Many exotic varieties of fruits and vegetables were introduced and screened during the period of 1975-85. During the Seventh Plan period, diversification and intensification programs were launched around high way corridors to commercialize horticulture. Long-term plans, such as MPHD and APP, were developed during early nineties. Since the later part of the 8th plan, initiations were taken to develop market infrastructures for horticultural produce. The APP has identified citrus, apple, off season vegetables, and seeds of vegetables and flowers as high value horticultural commodities. All the programs vision by the APP for its first phase were reflected in the ninth plan. During the ninth plan period, the average annual growth of production was 3.12% in fruits, 5.07% in vegetables, 6.71% in potatoes, 6.48% in spices, 20.94% in tea and 30.31% in coffee. Commercialization of citrus, off season vegetables and floriculture is a considerable achievement of the ninth plan period. From horticultural viewpoint, Nepal's position in the list of SAARC countries is in the upper side. Deficits in horticultural trade are in decreasing trend. However, low productivity and high cost of production have made our horticultural produce less competitive in both domestic and international markets.

INTRODUCTION

In spite of the long history of the use of some horticultural produce in religious purposes and kitchen gardening, horticulture development in Nepal in an organized way was started only after 1955 when a horticulture section under the Department of Agriculture was created. The establishment of 13 horticulture farms at different regions of the country in the early sixties was, in fact, the beginning of modern horticulture development. After the creation of a separate Department of Horticulture in 1967, emphasis was given on horticulture development in the mid hills. The prioritization of commodities was started when two divisions and two commodity-based programmes were formed under the Department of Agriculture in 1972. The two prioritized commodities at the national level were citrus and potato. Other major achievements made before 1972 were:

1. The identification of production pockets for temperate and citrus fruits;
2. Establishment of orchards in some pocket areas;
3. The beginning of the production of vegetables in accessible areas;
4. Introduction of improved varieties of fruits and vegetables;

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5. Infrastructure development at horticulture farms/stations;
6. Human resource development through trainings and higher education;
7. Establishment of progeny orchards at government horticulture farms; and
8. Production of planting materials.
9. The department of horticulture was responsible for horticultural research and development till 1971.

Box 1:

The establishment of 13 horticultural farms at different regions of the country in early sixties was the beginning of modern horticulture development. Citrus and potatoes were recognized as nationally important commodities in 1972. Progeny orchards were established at the government horticulture farms. These farms also produce vegetable seeds and fruit samplings for the farmers. The department of horticulture was responsible for horticultural research and development in 1971.

EFFORTS AND ACHIEVEMENTS DURING FIFTH TO SIXTH PLAN (1975-1985)

After the amalgamation of the Department of Horticulture into the Department of Agriculture in 1972, the momentum gained in horticulture development was set-back for some years. Nevertheless, the two newly created divisions and two national commodity programs started to take the lead roles in their mandated crops at the national level. Another important step taken by the government during this period was the declaration of "Agriculture Year 1975". Other efforts and achievements made during this period were as follows:

1. Many exotic varieties of fruits were introduced and screened during this period by Hill Agriculture Development Project.
2. Commercial orchards along the highway vicinities were started to develop.
3. Establishment of private fruit nurseries was initiated.
4. Vegetable seed production by both public and private sector was started.
5. The vegetable seed production project was commenced in 1981, which introduced many improved varieties of vegetables through screening.
6. Expansion of citrus areas under priority programme was initiated in 20 mid hill districts.
7. Provision of 50 percent subsidy was made for production inputs and horticultural implements.
8. Adaptive researches were carried out at government's horticulture farms.
9. The district agriculture development offices and horticulture farms provided extension services.

10. Production technologies of some important crops were developed.
11. Area and production of fruits, vegetables and potatoes during fifth and sixth plan period were as shown in table -1.

Table - 1

Particulars	End of 5th plan (1980)	End of 6th plan(1985)
Fruit		
a. Area (ha.)	42000	51000
b. Production (mt.)	274000	343000
Vegetable		
a. Area (ha.)	96000	138000
b. Production (mt.)	528000	743000
Potato		
a. Area (ha.)	51000	58000
b. Production (mt.)	278000	409000
Vegetable seed production (mt.)		
a. Private sectors	24.6	49.5
b. Govt. sectors	15.4	38.5
	9.2	11.00

Source: FDD, VDD, PDP

12. Per capita availability of Fruits, vegetables and potatoes during these periods were as shown in table - 2

Table - 2

Particular	Fruits	Vegetables	Potatoes
End of fifth plan	18.3	37.8	18.5
End of sixth plan	20.56	45.5	24.2

13. Skill development trainings to both farmers and field level technicians were accorded the highest propriety
14. Physical facilities at Khumaltar, Sarlahi, Marpha, Pokhara, Rukum and Dadeldhura farms were developed for vegetable seed production and processing.

Box-2:

The celebration of the "agriculture year" in 1975 was the beginning to privatize production of vegetable seeds and fruit samplings. Many exotic varieties of fruits and vegetables were introduced and screened during 1975-1985. Incentives were provided to establish commercial orchards along the highway vicinities. Skill development trainings to progressive and innovative farmers was accorded the highest priority. Physical facilities were developed at government farms for vegetable seeds.

EFFORTS AND ACHIEVEMENTS DURING SEVENTH TO EIGHT PLANS (1985-1997)

The Seventh Plan directed horticulture to develop along the highway corridors, cities and densely populated areas. Emphasis was given on the production of some selected commodities on commercial scale. Production was aimed to substitute import and promote export. The involvement of private sector in horticulture development was encouraged and policies were formulated accordingly. A vegetable seed production program was initiated by the private sector with the main objective of exporting seeds to Bangladesh and India. Then a large number of seed entrepreneurs became established and the Seed Entrepreneurs Association (SEAN) was formed in 1989. The SEAN later established Seed Service Center (SSSC) with the support from SSSP. In the Eight Plan, efforts were made to link commercial production programmes with the existing road infrastructures. Market led demand based programs were encouraged to implement. In order to increase income and employment opportunities to farmers, demand-based programs such as establishment of commercial orchards, development of commercial vegetable production pockets and promotion of coffee, cardamom, ginger and other spices, were implemented. The Floriculture Association of Nepal (FAN) was initiated in 1992 with the basic objective of promotion of floriculture business with the funding of AEC. The FAN has conducted several researches and studies on floriculture. In fact, many initiatives were taken during seventh and eighth plan for horticulture development and as a result of these initiatives, the following achievements were made.

1. Establishment of commercial orchards of important fruits, such as mango, litchi, banana, mandarin orange, junar, lime, apple, walnut etc.
2. Initiation of off season vegetable production
3. Supply of foundation seeds to vegetable seed growers by the government horticulture farms.
4. Establishment and strengthening of private fruit nurseries
5. Master plan for horticulture development was developed in 1990.
6. A separate Department of Horticulture was created in 1990 realizing the important of horticulture in the national economy. With this, Horticulture Development Offices were also proposed for 75 districts and 30 of them were also established. However, it could not run for long and was dissolved into the unified Department of Agriculture Development in 1992. Then a horticulture unit was created in each Agriculture Development Office to provide horticulture extension services intensively. For this, many posts of Assistant Horticulturists were also created. At the central level, the Fruit Development Division and Vegetable Development Division were upgraded. There was a Director of Horticulture in the Department of Agriculture Development.
7. Physical facilities, specially for training and laboratories, were developed at Horticulture Center, Kirtipur.
8. Initiatives were taken by the government to involve private sector, NGOs and cooperatives for horticulture development. As a result of these initiatives, horticultural enterprises started to be commercialized. Floriculture is a good example of commercialization through the efforts and investments of private sector.

9. Appropriate vegetable seed production technologies for important crops were developed during the second phase of the Vegetable Seed Production Project. During this period, vegetable seed production programs were extensively launched at different parts of the country. Seed processing and storage facilities were developed and handed over to AIC. The third phase of the project (1987-1992) focused its activities on fresh vegetable production, post harvest handling and marketing.
10. For the development of fruit sub-sector, a number of projects were implemented. The Hill Agriculture Development Project (1987-1993), The Hill Fruit Development project (1988-1995) and the Horticulture Development project (1985-1997), and Pakhribas and Lumle Agriculture Centers were the main ones.
11. Human Resources were developed through trainings and higher education.
12. Production scenario of the period 1985 to 1997 is shown in table 3

Table - 3

Commodity	End of 7 th plan (1990)	End of 8 th plan (1997)	Remarks
Fruit			
a. Area (ha.)	63126	62919	
b. Production (mt.)	461743	428225	
Vegetable			
a. Area (ha.)	140500	146503	
b. Production (mt.)	970200	1357435	
Potato			
a. Area (ha.)	59800	110850	
b. Production (mt.)	521425	991499	
Vegetable seed prodⁿ	<u>151</u>	<u>419</u>	
a. Private sector (mt.)	134	400	
b. Gov. farm (mt.)	17	19	
Fruit sapling		<u>351852</u>	
a. Private sector (mt.)		161500	
b. Gov. farm (mt.)		190352	
Coffee production (mt.)		38	
Tea production (mt.)		2905	
Spices (mt.)		96689	

Source: FDD, VDD

13. Up to the end of Eight Plan, about 120 floriculture nurseries were established by the private sector. Most of these nurseries produced and supplied pot plants, seeds and seedlings of seasonal flowers.
14. The Agriculture Perspective Plan (APP), formulated in 1995, has identified citrus, apple, off-season vegetables, and seeds of vegetables and flowers as high value commodities.

These commodities have comparative advantages in the hill and mountain regions. According to the APP, citrus is prioritized in the mid-hills; apple in the inner Himalayan zone; off season vegetable in the hills and terai; and vegetable and flower seeds in the hills and mountains. The income from high value crops is expected to triple over the plan period of 20 years. The annual growth rate of these crops is expected to accelerate from 4.8 percent to 5.1 percent. With a focus on export, their growth rates are likely to go even higher.

15. Due to the creation of an enabling environment through new policies and legislation, non-governmental organization (NGOs), cooperatives and community-based organizations (CBOs) were emerging as institutional options to carry out horticultural development programs in the country. For example, the Center for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED) an NGO, implemented an off-season vegetable production program along Dharan-Basantapur highway in Dhankuta district. This program was successful to commercialize off-season vegetable production in the eastern region of Nepal. Though not to this extent, there are many other NGOs and CBOs involved in horticulture development.
16. Projects like Support to New Kalimati Fruit and Vegetable Wholesale Market, Small Marketing Infrastructure Project (SMIP) and Market Access to Rural Development (MARD) have remarkable contribution to promote market-oriented production of fruits and vegetables. The SMIP was successful to develop 19 market centers at different places of central and western regions. All these market centers are in operation at present. The Kalimati Fruits and vegetables wholesale market is providing market to the produce of more than 20 districts. The throughput of this market is more than 100000 tones per annum. The MARD project introduced many hybrid varieties of some vegetable crops and also linked production areas to the markets. The contributions of the USAID funded Rapti development Project through No-Frills under the VFC program and the DFID funded KOSIVEG and later SSSP, are also mentionable when we talk of the horticulture development in Nepal.

Box -3:

During the seventh plan, horticulture development was concentrated around highway corridors, cities and densely populated areas. Production was aimed to substitute import and promote export. A large number of seed entrepreneurs became established Diversification and intensification programs were launched to commercialize horticulture. Promotion of floriculture was initiated by private sector. Long term master plans were developed. Many posts of assistant horticulturists were created to intensify extension services and physical facilities for training were developed at Kirtipur. Due to the creation of enabling environment, many partners started to get involved in horticulture development. During later part of the 8th plan, market infrastructures were developed for horticultural produce.

EFFORTS AND ACHIEVEMENTS DURING THE NINTH PLAN (1997-2002)

Many initiatives, already taken but incomplete, were continued during the Ninth Plan. Priority was given to the production and marketing of high value crops. In fact, all the programs visioned by the APP for its first phase, were reflected in the Ninth Plan. From the viewpoint of horticulture development , the following efforts and achievements were made during the Ninth Plan period.

1. 38 Varieties of vegetable and 6 varieties of potatoes are released by the National Seed Board (NSB)
2. 21 tones of vegetable seeds were exported to India and Bangladesh in 2000/01
3. An estimated 100 private seed enterprises are presently active in vegetable trading
4. The annual demand of vegetable seeds is estimated to be 1500 mt; of which around 550 mt. (33%) is imported, another 48 percent (729) is formally produced and the rest is handle by the informal sector.
5. Initiatives have been taken for scaling-up of developed horticultural technologies
6. More than 300 private nurseries have been established for floriculture production
7. A total of 1324651 fruit saplings were produced in 2000/01, of which 1102916 (83%) were from private sector and the remaining 221735 (17%) were from the government farms. There are 393 private fruit nurseries in the country at present.
8. The negative trade balance in horticulture is at decreasing trend. For example, the negative trade balance of Rs. 160500000 in fruits in 1997/98 was reduced to Rs. 77800000 in 2000/01. In vegetables the trade balance is estimated to be in positive side.
9. About a dozen seed enterprises are engaged in contract seed production.
10. The production and supply of stock seeds of vegetable crops have been initiated by the private sector. SSSC has started both production and field inspection programs for the private sector in the Koshi and western hills.
11. Twenty three cold stores with storage capacity of 43600 mt. are in operation at present. These cold stores are mainly used for storing horticultural products.
12. The Agro Enterprise Centre (AEC) has played an important role in the collection and dissemination of market information related to demand, supply and prices of horticultural produce.
13. Besides NARC/DOA farms, SSSC, CEPREAD, GRESSCO, etc are also maintaining some varieties of vegetable crops. CBED, an NGO with the support of CECI (INGO) has been promoting seed production and marketing programs through contractual production. It is working jointly with SSSP in Dadeldhura district.
14. Self-sufficiency has been attained in the production of true potato seeds. it is produced at Horticulture Centre, Sarlahi.
15. According to Budathoki, (2001), their are 23 vegetable crops whose hybrids are commonly used by the growers. Use of hybrids is higher in the hills (27.4%) than in terai (5.2%)

16. The number of major markets for fruits and vegetables in Nepal is 33 whereas the number of periodic markets (Hat Bazars) is 969, of which 14 were established by the government.
17. The contribution of fruits and vegetables excluding potatoes to AGDP is 13.6 percent.
18. In Nepal, horticultural crops occupy only about 3 percent of the cropped land, yet their contribution to the gross value of agriculture production is about 24 percent.
19. During the Ninth Plan Period, the average annual growth of production was 3.12% in fruits 5.07% in vegetables, 6.71 percent in potatoes, 6.48% in spices, 20.99 % in tea, and 30.31% in coffee. Similarly, the growth of area expansion was 3.98 in fruits 1.92 in vegetables and 5.63 in spices.
20. The per capita production in the fiscal year 2001/02 was 20.7 kg. of fruits, 74.0 kg of vegetables, and 59 kg of potatoes.
21. Production & area coverage scenario of the period 1997 to 2002 is shown in table 4 and 5

Table - 4: Production

Commodities	Unit	1997/98	1998/99	1999/2000	2000/01	2001/02
Fruits	mt.	447447	437290	478479	462147	433495
Vegetables	mt.	1449475	1342567	1489665	1652980	1738087
Spices	mt.	102 064	108164	110446	124513	132375
Potatoes	mt.	971680	1091218	1182500	1313713	1380196
Tea	mt.	3021	4493	5085	6638	8198
Coffee	mt.	56	48	72	89	139

Table - 5: Area coverage

Commodities	Unit	1997/98	1998/99	1999/2000	2000/01	2001/02
Fruits	ha.	66048	68555	70985	74972	775538
Vegetables	ha.	149979	140177	149030	157162	161088
Spices	ha.	22772	23973	25899	27363	28518
Potatoes	ha.	116290	118043	112620	129019	131123
Tea	ha.	-	-	-	-	12643
Coffee	ha.	259	272	314	424	764

Source: MOAC, NTCDB

22. Production scenarios of main horticultural crops in the SAARC countries are shown in (Table – 6)

Table –6: Production scenarios of main horticultural crops in the SAARC countries

Area : ha.
Production : mt.
Yield : mt./ha.

Crops	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Shrilanka
1. Potato							
a. Area	248988	3100	141000	-	135115	105200	4250
b. Prod ⁿ	3216000	22000	24000000	-	1472757	1721600	57680
c. Yield	12.91	7.0	17.0	-	10.9	16.4	13.6
2. Vegetable							
a. Area	305593	1637	5729000	2033	166396	360351	75740
b. Prod ⁿ	1830000	4700	78187300	30144	1723113	4828459	602830
c. Yield	6.0	3.0	13.6	14.8	10.3	13.4	7.9
3. Fruits							
a. Area	182968	7000	3887175	885	60522	626480	103660
b. Prod ⁿ	1411900	36600	46641300	12140	585709	5375669	842440
c. Yield	7.7	5.2	12.0	13.7	9.7	8.6	8.1
4. Tea							
a. Area	48600	-	430000	-	12365	-	189000
b. Prod ⁿ	52000	-	826165	-	7518	-	310000
c. Yield	1.0	-	1.9	-	0.6	-	1.5
5. Coffee							
a. Area	-	-	308000	-	596	-	1521
b. Prod ⁿ	-	-	317000	-	139	-	10210
c. Yield	-	-	1.0	-	0.2	-	0.7
6. Ginger							
a. Area	7290	350	80000	-	9189	78	1521
b. Prod ⁿ	42000	3100	275000	-	87909	28	5460
c. Yield	5.7	8.8	3.4	-	9.5	0.4	3.6
7. Chillies							
a. Area	-	937	5500	-	3325	-	17350
b. Prod ⁿ	-	2900	50500	-	7082	-	49040
c. Yield	-	3.0	9.1	-	2.1	-	2.8

Source: Statistical Bulletin of SAARC Agricultural Data 2003.

23. In recent years, some attempts have been made to explore potential markets for exporting horticultural produce and as a result of these efforts little progress has been made (Table 7).

Table 7: Export of some Horticultural produce during the Ninth Plan Period.

Commodity	1997/98	1998/99	1999/2000	2000/01	2001/02
Vegetable seeds (mt.)	17.5	18.0	15.0	21.0	
ginger products (Rs) million	167.4	193.0	222.0	223.0	242.0
Large cardamom (Rs in million)	227.7	238.8	223.0	311.6	
Tea	8.8	23.5	27.7	26.3	
Vegetable	9.5	10.9	8.4	13.9	39.9
Fruits	3.0	3.2	14.2	3.3	
Turmeric	-	2.4	2.5	3.3	

Source: NPC, MDD, NSB

23. With the establishment of an autonomous NARC in 1991, horticultural research was expected to be strong but due to inadequate manpower, this expectation could not be materialized. However, when the donor supported program like Hill Agriculture Research Program (HARP) started researches after 1996, this sector also got the priority. The HARP conducted 31 research projects on various aspects of horticulture during 1998-2001. Other horticultural research stations carrying out horticulture researches are located at Pakhiribas, Lumle, Paripatle, Pokhara, Jumla, Dailekh, Tarahara, Surkhet, Doti, Parwanipur, Nepalganj and Khumaltar. The National potato Research programs on potatoes and ginger are involving in the research of their respective commodities. Further, horticultural farms under DOA and some NGOs like SSSC, CEPREAD, are also carrying out adaptive researches on various aspects of horticulture in the country.
24. In the supply side, Nepal is on the top of the list of SAARC countries in the per capita supply of potatoes and spices. In vegetable supply, Nepal is third after Maldives and India. The supply of horticultural products in the SAARC countries is presented in table - 8 (2001).

Table - 8

(in kg/capita)

Commodity	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Potatoes	18.86	-	15.83	9.93	41.33	9.33	5.62
Vegetables	11.78	-	71.50	134.11	63.96	33.02	32.76
Fruits	10.01	-	40.67	87.01	23.21	34.84	40.69
Spices	1.2	-	1.97	1.94	5.08	1.47	3.64
Coffee	-	-	0.07	2.05	0.01	-	0.55
Tea	0.32	-	0.66	0.85	0.30	0.72	0.27

Source: Statistical Bulletin of SAARC Agriculture Data - 2003

Box 4:

All the programs visioned by the APP for its first phase were reflected in the Ninth Plan. During the plan period, the annual growth of production was 3.12% in fruits, 5.07% in vegetables, 6.71% in potatoes, 6.48% in spices, 20.99% in tea and 30.31% in coffee. The donor-supported projects like HARP, have completed many research projects on horticulture during this period. Citrus, off-season vegetables and floriculture have been commercialized to a considerable extent. Involvement of multi stakeholders in horticultural research and development is encouraging. From horticultural viewpoint; Nepal's position in the list of SAARC countries is in the upper side. however productivity is low and cost of production is higher with SAARC countries.

ISSUES AND CHALLENGES:

Despite some achievements made in the past, horticulture is facing many challenges at present. Further, Nepal is to become a member of the World Trade Organization (WTO) and SAFTA the agriculture trade, including horticulture, will then be liberalized. If Nepal is to get benefits from it, tuning of the present production system to the widening access in the open markets would be required and it may bring many challenges in the form of competition, obligation and protectionism. Because of the low productivity, high prices of production inputs, high marketing costs and poor rural infrastructures, Nepalese produce have become less competitive even in the domestic markets. Subsidies in irrigation and production inputs were provided in the past but have been discontinued in recent years in the context of policy liberalization. The research support, which is essential to put the country in a technologically competitive situation, is also weak in Nepal compared with neighboring SAARC countries. Although, APP has given top priority to high value horticultural crops, the performance has remained rather poor. It is partly because of capital constraints. The Ninth Plan MTR has reported that only half of the projected allocation was made available. This is the overall scenario of investment in agriculture. The situation of investment in horticulture sub-sector is even worse. This has affected government's horticulture farms very badly.

The other issue related to high cost of production and competitiveness is the post harvest loss. Post harvest losses of fruits and vegetables are 12 to 35 percents of crop yields in Nepal (Werner and Kaini 1997). Handling procedures from farm to retail markets have participation in the losses. Landlessness, difficult terrain and scattered production pockets have led to high cost of production and marketing resulting in less competitiveness of the products. Weak quality control and regulatory mechanism, and weak linkage among production, agro-industries and trade are also crucial issues. The present institutional setup is not capable to deal with new challenges.

RECOMMENDATIONS

Unless the current issues and challenges are addressed, the success of Nepalese horticulture is not possible. In order to address them, the following recommendations are made.

1. Identification and exploitation of the comparative niches should get top priority and be reflected in the annual programs.

2. Investments in horticulture must be stepped up significantly. For this, donor and private investments should be promoted /encouraged.
3. Research should be focused on low cost production and postproduction technologies.
4. Cooperative marketing of both inputs and outputs should be promoted.
5. Selective subsidies are still essential to promote high value crop production in commercial scale.
6. Enough budget should be provided for construction of agricultural roads and market infrastructures in horticulturally potential areas.
7. Policies, plans and programmes should be implemented effectively
8. Strong of linkage between production and agro industries should be developed.
9. Tuning of the agricultural production system to the widening access in the international market is essential.
10. Structural adjustments in the present context should be made.
11. Development of human resources through training and other capacity building measures should be incorporated in annual programs.
12. Retention of skilled manpower in horticulture is necessary.

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