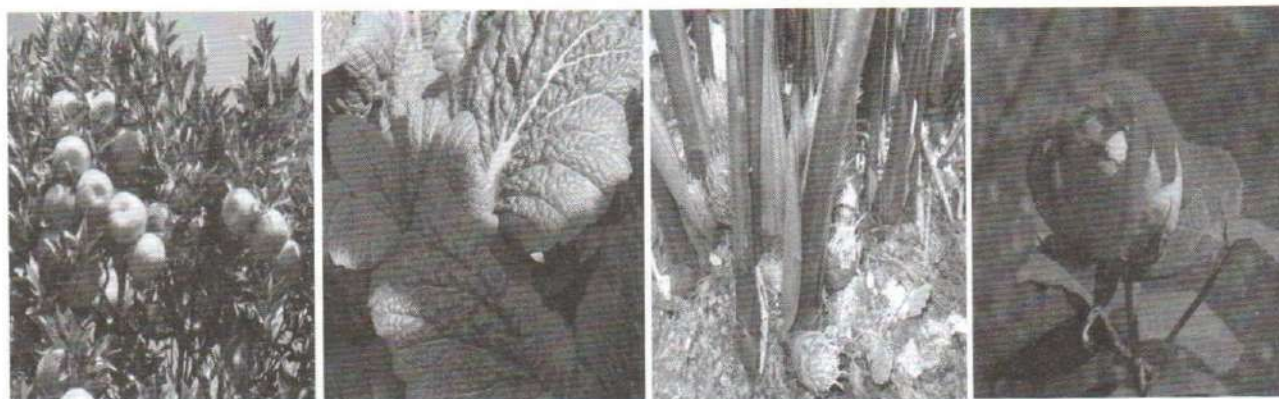


STATUS OF HORTICULTURE IN NEPAL

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ABSTRACT

Government organizations were not in existence before 1950 to develop horticulture sector. Cultivation of horticulture crops was limited to homestead gardens. After the creation of Department of Horticulture during sixties several horticulture farms were established in different agro-ecological zones where research and extension programs were launched and horticulture development took momentum. Nepal has diverse agro-climatic zones which are suitable for the production of different niche high value crops. There is tremendous scope for commercial horticultural crops production to enter into the international market. Due to poor transportation facilities, infra-structure, linkage to the international market and technical know-how, horticulture development could not gain momentum as anticipated although suitable pocket areas for the production of fruits, vegetables and other high value commodities have been identified. Thus, some recommendations are mentioned here so that commercial production and marketing of horticulture crops can be strengthened which ultimately back up the economy of the country.

Key words: Horticulture industry, infrastructure, niche product, indigenous, exotic, plantation crop, cut flower, post-harvest, export, import.

Introduction

Horticulture was limited to growing indigenous fruits and vegetables before 1950 in the private sector, while collection and growing of fancy plants existed in the palaces of Rana Prime Ministers and their families. Horticulture development at the government level started during sixties when the Horticulture Division was created in the newly established Department of Agriculture. Many farms were established during sixties, commodity development divisions were established in seventies, several projects were implemented and NARC was established in eighties, concept of privatization and sustainability of horticultural farms was introduced in nineties, and commodity divisions were promoted to directorates and horticultural farms were given commodity specific mandates and their names were also changed accordingly. In the last sixty years, there have been significant progresses

in policy development, institutional development, and technology generation and transfer. Fruit production has increased to 992,703 MT, vegetable production to 3,580,085 MT, and potato to 2,586,287 MT from almost less than 100,000 MT combine one sector during the early fifties. With Nepal's membership to WTO and regional trade associations, increasing education levels and nutrition knowledge of the people, increasing demand for fruits and high import etc. shows high prospects for horticulture development in Nepal. In order to harness the potentiality of horticultural development in Nepal experience shows that there are challenges for enhancing production, improving physical infrastructure, enhancing marketing and promotion of processing is to be addressed.

Nepal is an agrarian country having 31.23% contribution of agriculture in GDP where 65.6% population is engaging (MoAD, 2014). Majority of agriculture is subsistence type and still it is cereal based farming where vegetable, fruits, and cash crops are in secondary position with remarkable growth rate (Karkee, 2008) although horticulture sub-sector has the most significant role in AGDP with shares of 21.42 percent.

Geophysical Situation

Nepal is situated as trapezoidal shape 870 km in length by 130 km in width. Its total area is 1,47,181 sq. km. In latitude, it ranges from 26°22' to 30°27' N and in longitude from 80°04' to 88°12' E. In altitude ranges from about 60 m above mean sea level in the Terai (Kechna Kabal, Jhapa) in the South-East to 8,848 masl at the summit of Mount Everest in the North. It is surrounded by China in the north and India in the east, west and south. Nepal is affected by the monsoon system of the Indian sub-continent. Three distinct seasons experienced in Nepal are hot and dry season from March to mid-June, wet summer from mid-June to September and dry and cold season from October to February. The unique agro-ecological zones favored by altitudes, topography, and aspect within the country offer an immense opportunity for growing different types of fruits, vegetables, flowers, spices and other agronomical crops. Nepal is rich in biodiversity as wild plants of mandarin in Mangtewa, custard apple in Dhankuta in the east while Amla (*Phyllanthus emblica* – Indian gooseberry) plants in Jasbire way to Indrawati, wild citron in mid hill of central region and wild olive plants are found in Humla and Kalikot the western part of Nepal. Actually, Nepal is the land of wonder with agro-climatic variability. Almost all types of world climate and a wide range of bio-diversity exist in Nepal.

Organizational Development

Government organizations were not in existence before 1950, yet growing of horticultural crops like fruits, vegetables, spices and flowers started from time immemorial. In an ancient period Nepalese people used to cultivate indigenous fruits like guava, pear, peach, citrus: vegetables like radish, mustard leaf, red turnip, cucurbits: spices like coriander, onion, garlic, soup: flowers like marigold, cactus, wild rose etc. Cultivation of horticulture crops was limited to homestead gardens.

Nearly 1950 B S, prior to Rana Regime horticulture grew as a collection of fancy and exotic horticultural plants such as persimmon, loquat, peach, pear, fig, litchi and mango; flowering plants like coral, magnolia, China rose, and evergreen plants like exotic pines, monkey puzzle plants etc. in Putali Bagaincha, Singhadurbar, Kathmandu which was meant for entertaining Rana Prime Ministers and their family members. At that time there was also a Plant Introduction Unit established in Godawari, Lalitpur to maintain the introduced plants.

After the creation of Department of Horticulture during sixties several horticulture farms were established in different agro-ecological zones with the support of Indian Cooperation Mission (ICM). Horticulture farms established at that time were at Kirtipur, Pokhara, Dhankuta, Dhunibeshi, Kakani, Palpa, Janakpur, Helambu, Baitadi, Jumla, Rampur and Humla. GTZ supported Gandaki Zone Agriculture Development Project GADP was started in 1969 that had a significant component on horticulture development. Similarly, Japan government helped to establish Janakpur Zone Agriculture Development Project (JADP) in 1973 and has impact in the development of Junar (Sweet Orange) in Sindhuli and Ramechhap. Karnali Bheri Integrated Rural Development (KBIRD) Project supported by CIDA includes the horticulture component in their activities. USAID supported Rapti Integrated Rural development Project (RIRDP) has the impact in horticulture in the west. UK/ODA supported Koshi Hill Area Development Project (KHARDEP) was started in 1981 and has the impact in orchard development in citrus and vegetable seed production in the east. A fruit preservation unit was established at Kirtipur which support for training program and to produce processed product. Production and distribution of fruit saplings and vegetable seeds started from various farms. Many private nurseries and commercial orchards were established all over the country.

During seventies, government of Nepal gave further impetus to horticulture development. Fruit Development Division (FDD), Vegetable Development Division (VDD), National Potato Development Program (NPDP) and National Citrus Development Program (NCDP) were established under Department of Agriculture. In 1975, five agriculture related departments were merged to create the Department of Agriculture Development (DoAD). During this period, horticulture component was introduced in various agriculture stations such as Parwanipur, Bhairahawa, Nepalgunj and Tarahara/Sunsari. Horticulture farm Panchkhal/Kavre and Solu were established in 1975 and Dailekh in 1977. FAO supported Hill Agriculture Development Project (HADP) was started in 1973 which strengthened Horticulture Farms of Kirtipur, Trishuli, Jiri, and Jumla. It also imported germplasms of many types of fruits and distributed in different governmental farms. Vegetable Seed Production Centre Mushikot/Rukum was established in 1978 where onion seed production is the main focus till date. Horticulture Farms carried out fruit research and development activities under technical guidance of FDD and NCDP where as vegetable, potato and spices research and development activities are guided by VDD, NPDP and NSDP.

A separate post of Deputy Director General (DDG, Horticulture) was created in the Department of Agriculture in 1982. Citrus development program was given a national priority since then. FAO supported Vegetable Seed Production Project was started in the same year. Vegetable Seed Production Centre Dadeldhura was also established in 1982. JICA supported Horticulture Development Project (HDP) was started in 1985 and ADB supported Hill Fruit Development Project was started in 1987. Kalimati Fruit and Vegetable Wholesale Market was established in 1986. Agricultural research was given a special focus and a separate research wing named Nepal Agricultural Research and Services Centre was created in 1987 which was promoted to Nepal Agricultural Research Council (NARC) in 1991. Department of Horticulture was re-established in 1990 and was functional up to 1992 and then unified in Department of Agriculture Development. During this period some horticulture farms such as Horticulture Farm Rasuwa and Helambu were handed over to the Ministry of Forests and Soil Conservation and Horticulture Farm Kakani to

the Ministry of Tourism. Some farms namely Horticulture Farms Humla, Dhunibesi/Dhading, Helambu/Sindhupalchowk and Janakpur were privatized with certain criteria to ensure the continuation of horticultural activities in the farms. In 1993, a post of Assistant Horticulturist was created in each District Agriculture Development Office (DADO). In 1994, Horticulture Farms Humla, Dhunibesi, Janakpur and Panchkhal were returned to the Department of Agriculture from the private sector. Tea and Coffee Development Board was established in 1993. In 1995, 20-years' Agricultural Perspective Plan (APP) was formulated and implemented where out of the four priority outputs, high value commodity was one including horticulture. Nepal Horticultural Society (NHS) was established officially in 1990 to enhance public awareness towards the importance of horticulture and to promote linkages with national and international institutions. After two years of its establishment, Floriculture Association of Nepal (FAN), a private sector organization was also started functioning in the field of flower sub-sector development.

Ministry of Agriculture and Cooperatives was restructured in 2002. The commodity development divisions were renamed to development directorates such as Fruit Development Directorate (FDD) and Vegetable Development Directorate (VDD). National Citrus Development Program, and Tea and Coffee Development Section were kept under FDD and National Potato Development Program and National Spices Development Program were kept under VDD. Different horticultural farms were renamed according to the functions they have to carry out in future. Horticultural Farm Sarlahi was renamed to Tropical Region Horticulture Center, Horticultural Farm Panchkhal as to Spice Development Center, and Horticulture Farm Godabari as Floriculture Development Center and so on.

Distribution of Horticultural Crops

1. Vegetables

During the last 10 years, area of vegetable crops has increased by about 41% from 189,832 in 2005-06 to 266,937 hectares in 2014-15 whereas the production has increased by about 63% from 2,190,100 MT in 2005-06 to 3,580,085 MT in 2014-15 as shown in table 1 and figure 1.

Table 1. Area, production and productivity of vegetables in Nepal

Year	Area (Ha)	Production (MT)	Yield (MT/Ha)
2005/06	189832	2190100	11.54
2006/07	191922	2298689	11.98
2007/08	208108	2538904	12.20
2008/09	225154	2754406	12.23
2009/10	235098	3003821	12.78
2010/11	244102	3203563	13.12
2011/12	245037	3298816	13.46
2012/13	246392	3301684	13.40
2013/14	254932	3421035	13.42
2014/15	266937	3580085	13.41

Source: MoAD, 2014/15

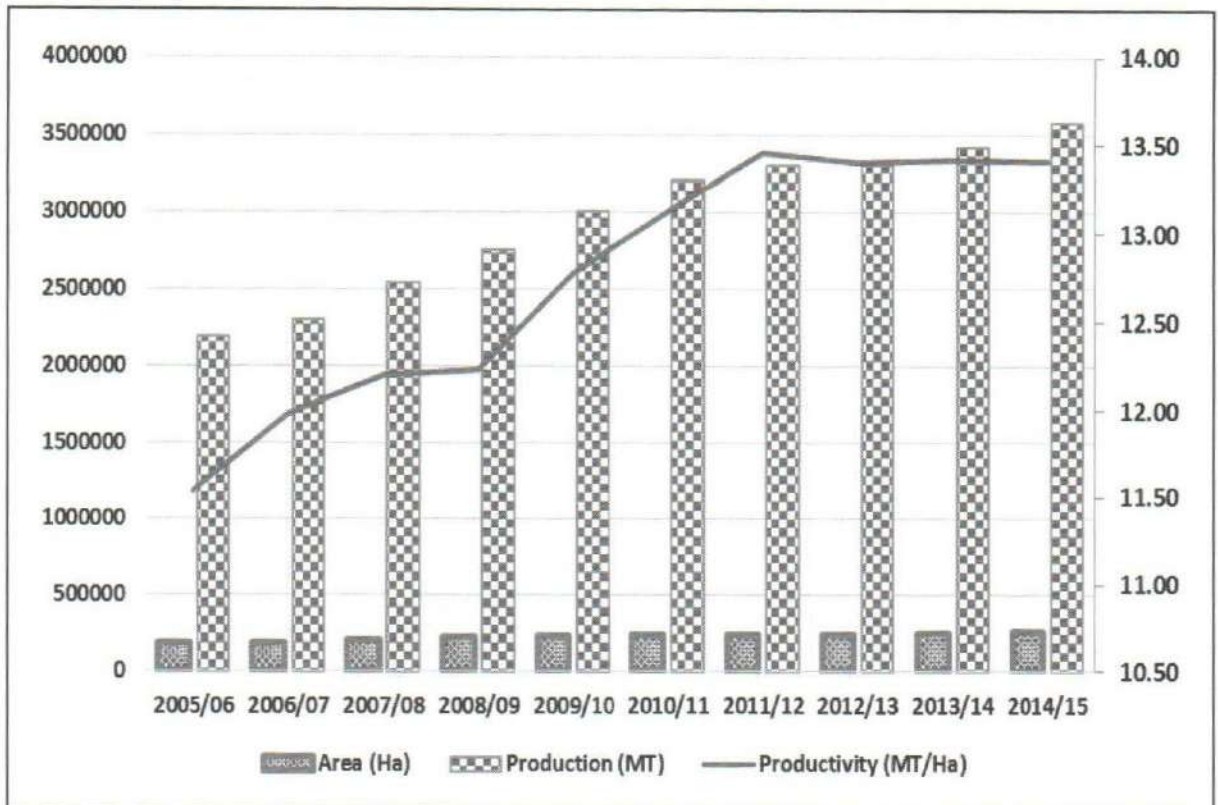


Figure 1. Trend of area, production and productivity of vegetables

2. Fruits

Table 2 and figure 2 shows that during the last 10 years, area of fruits has increased by about 64% from 91,923 in 2005-06 to 261,739 ha in 2014-15 whereas the production has increased by about 85% from 535,449 MT in 2005-06 to 1,762,617 MT in 2014-15.

Table 2. Area, production and productivity of fruits in Nepal

Year	Total Area (Ha)	Productive Area (Ha)	Production (MT)	Productivity (MT/ha)
2005/06	91923	56549	535449	9.47
2006/07	94901	57595	575095	9.99
2007/08	100099	63432	630563	9.94
2008/09	103651	68785	686213	9.98
2009/10	107322	70722	706972	10.00
2010/11	117932	79184	794165	10.03
2011/12	139321	101233	1029754	10.17
2012/13	137759	101480	938730	9.25
2013/14	150150	110617	979542	8.86
2014/15	150387	110802	992703	8.96

Source: MoAD, 2014/15

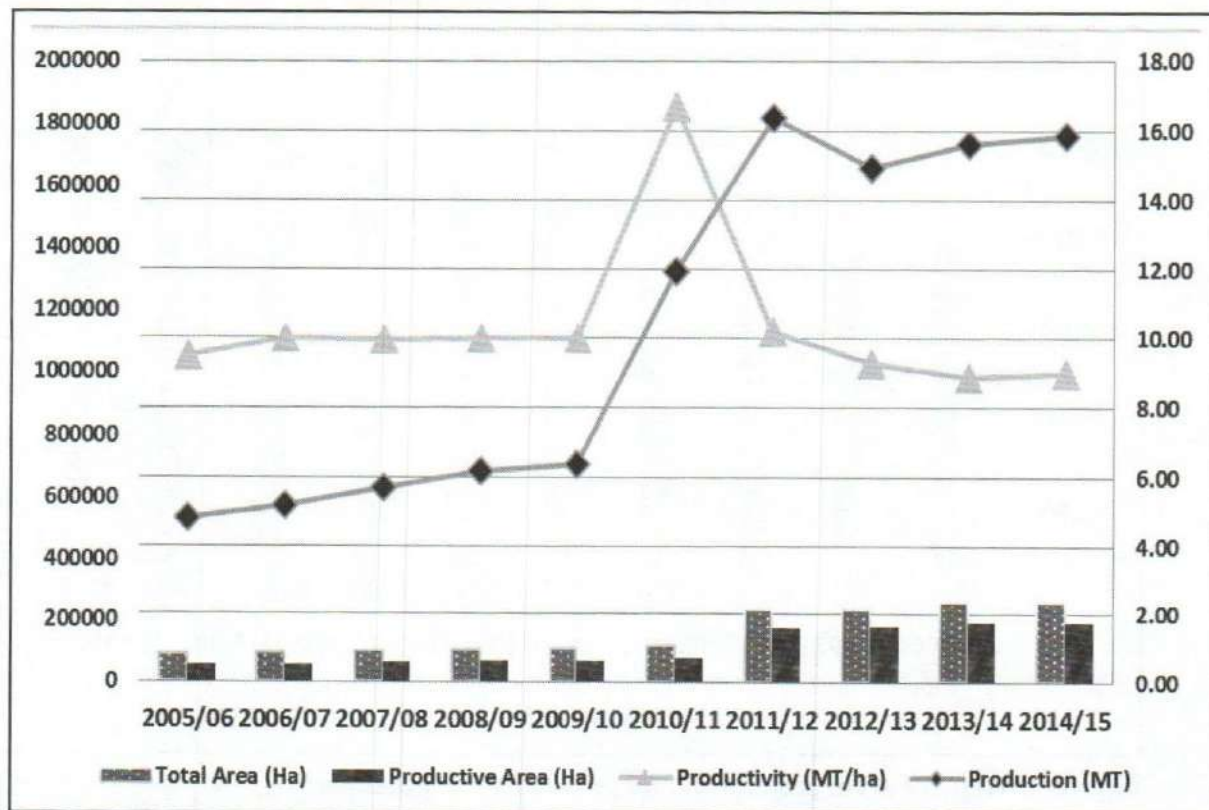


Figure 2. Trend of area, production and productivity of fruits

3. Potatoes

During last 10 years, area and production of potatoes have been increased by about 31% from 150,864 to 197037 ha and from 1,974,755 MT to 2,586,287 MT respectively.

Table 3. Area, production and productivity of potatoes in Nepal

Year	Area (Ha)	Production (MT)	Yield (MT/Ha)
2005/06	150864	1974755	13.09
2006/07	153534	1943246	12.66
2007/08	156737	2054817	13.11
2008/09	181900	2424048	13.33
2009/10	185342	2517696	13.58
2010/11	182600	2508044	13.74
2011/12	190250	2584301	13.58
2012/13	197234	2690421	13.64
2013/14	205725	2817512	13.70
2014/15	197037	2586287	13.13

Source: MoAD, 2014/15

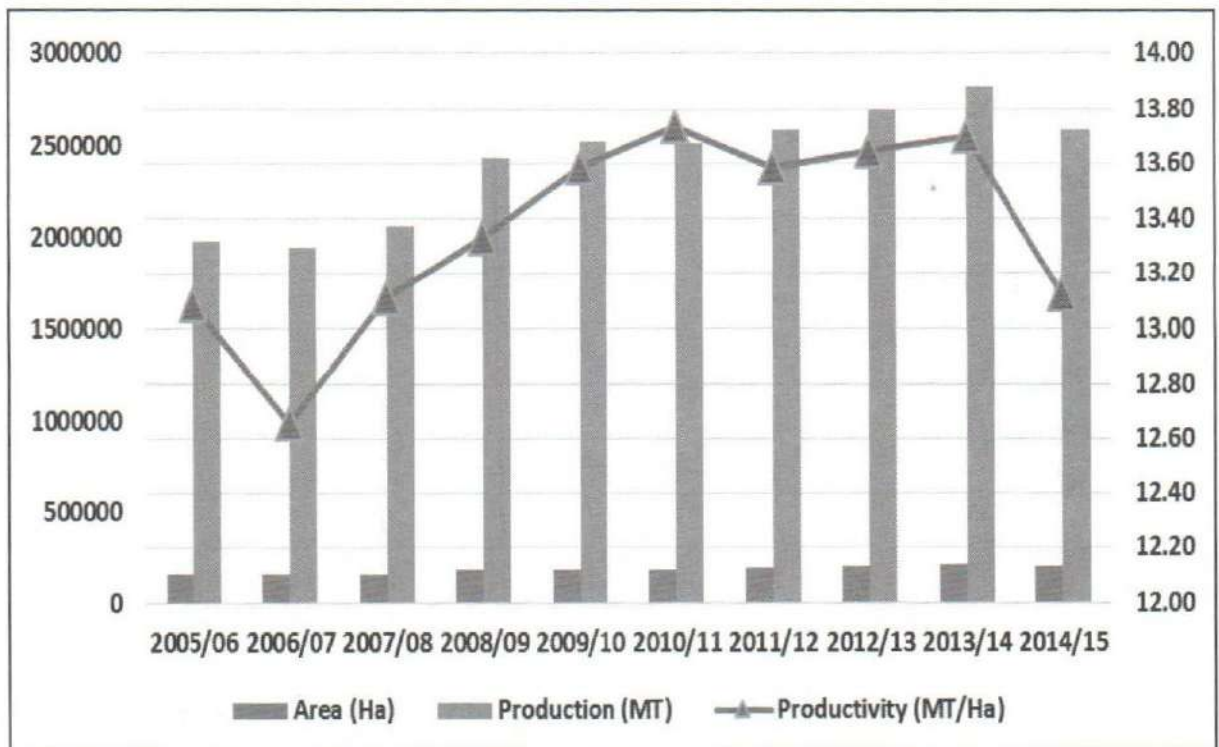


Figure 3. Trend of area, production and productivity of potatoes

4. Spices

During last decades, area of spice crops has increased by about 64% from 35,956 in 2005-06 to 58,960 ha in 2014-15 whereas the production has increased by about 78% from 226,914 MT in 2005-06 to 404,420 MT in 2014-15 as shown in table 4 and figure 4.

Table 4. Area, production and productivity of spices in Nepal

Year	Area (Ha)	Production (MT)	Productivity (MT/Ha)
2005/06	35956	226914	6.31
2006/07	37547	248644	6.62
2007/08	38980	243210	6.24
2008/09	42756	276445	6.47
2009/10	45744	320143	7.00
2010/11	47867	323870	6.77
2011/12	48848	364915	7.47
2012/13	47770	345216	7.23
2013/14	57639	429709	7.46
2014/15	58960	404420	6.86

Source: MoAD, 2014/15

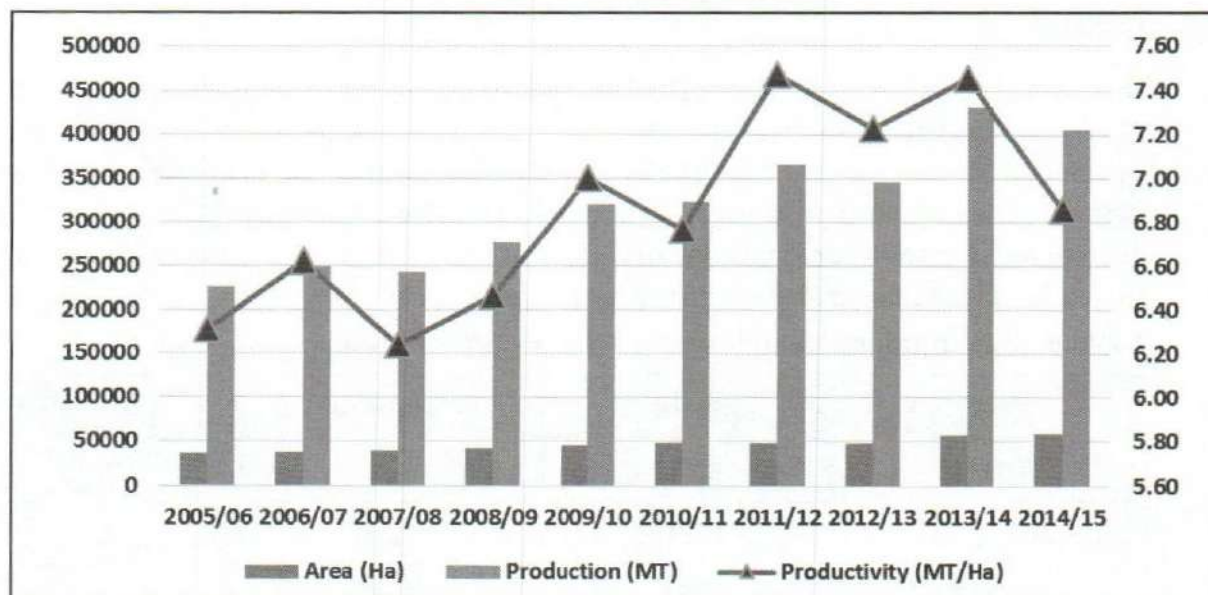


Figure 4. Trend of area, production and productivity of spices

5. Tea

During the last 5 years, area of tea has increased by about 13 % from 17,125 in 2009-10 to 19,271 ha in 2013-14 whereas the production has increased by about 29% from 16,532 MT in 2009-10 to 21,394 MT in 2013-14 as shown in table 5 and figure 5.

Table 5. Area, production and productivity of tea in Nepal

Year	Area (Ha)	Production (MT)	Yield (MT/Ha)
2009/10	17125	16532	0.97
2010/11	17451	17438	1.00
2011/12	18149	18726	1.03
2012/13	19036	20588	1.08
2013/14	19271	21394	1.11

Source: MoAD, 2013/14

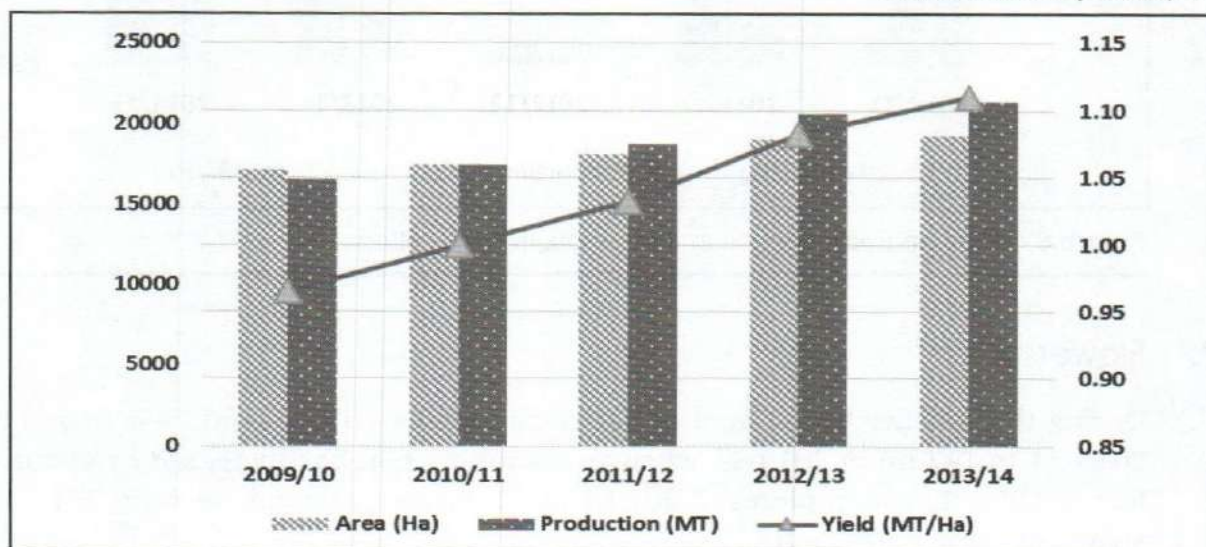


Figure 5. Trend of area, production and productivity of tea

6. Coffee

During the last 5 years, area of coffee has increased by about 36% from 1,752 in 2010-11 to 2,381 ha in 2014-15 whereas the production (green beans) has increased by about 15% from 402 MT in 2010-11 to 464 MT in 2014-15 as shown in table 6 and figure 6. The area and production is in increasing trend but the productivity is slightly decreasing due to the reason that new plantation for area expansion is increasing but the coffee plants haven't come into fruiting stage yet.

Table 6. Area, production and productivity of coffee in Nepal

Year	Area (Ha)	Production (MT)	Yield (MT/Ha)
2010/11	1752	402	0.23
2011/12	1780	425	0.24
2012/13	1750	366	0.21
2013/14	1911	429	0.22
2014/15	2381	464	0.19

Source: MoAD, 2014/15

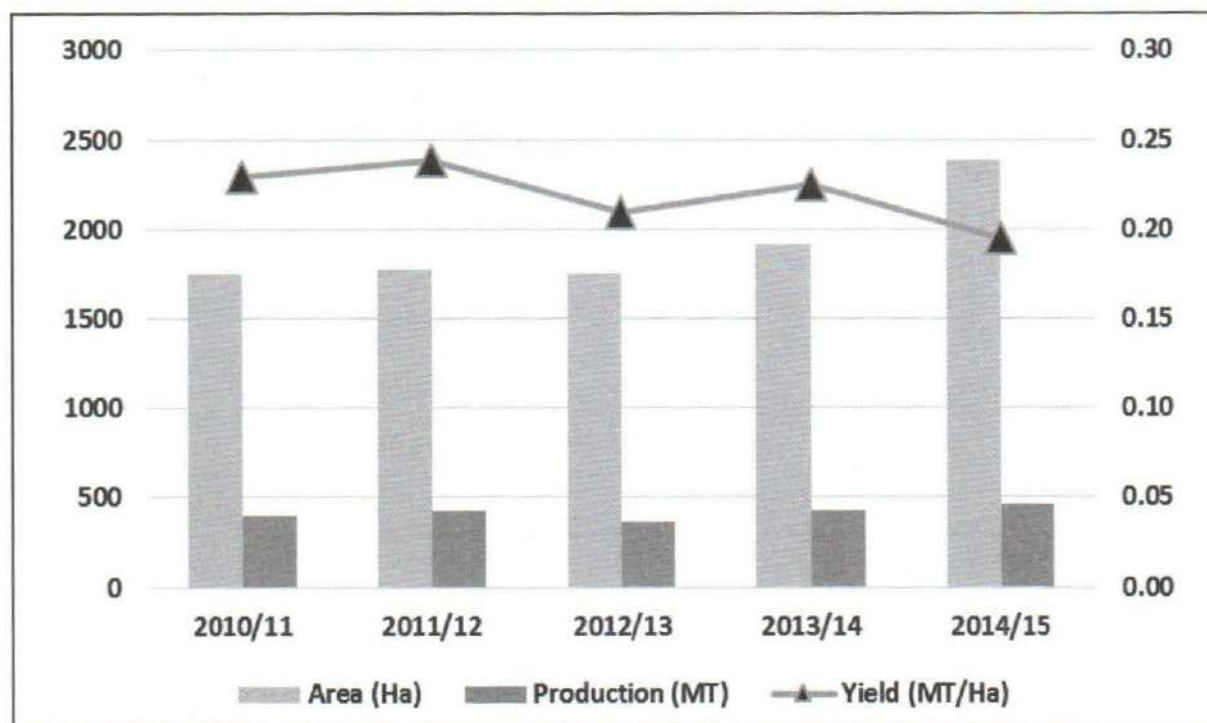


Figure 6. Trend of area, production and productivity of coffee

7. Flowers

During the last five years, area of flower has increased by about 34% from 110 in 2010-11 to 147 ha in 2014-15 whereas the production has increased by about 47% from 90,990 thousand pieces in 2010-11 to 134,138 thousand pieces in 2014-15 as shown in table 7 and figure 7.

Table 7. Area, production and productivity of flowers in Nepal

Year	Area (Ha)	Production ('000 Pcs.)	Productivity ('000 Pcs./Ha)
2010/11	110	90990	827.18
2011/12	120	105320	877.67
2012/13	137	115570	843.58
2013/14	141	127750	906.03
2014/15	147	134138	912.50

Source: MoAD, 2014/15

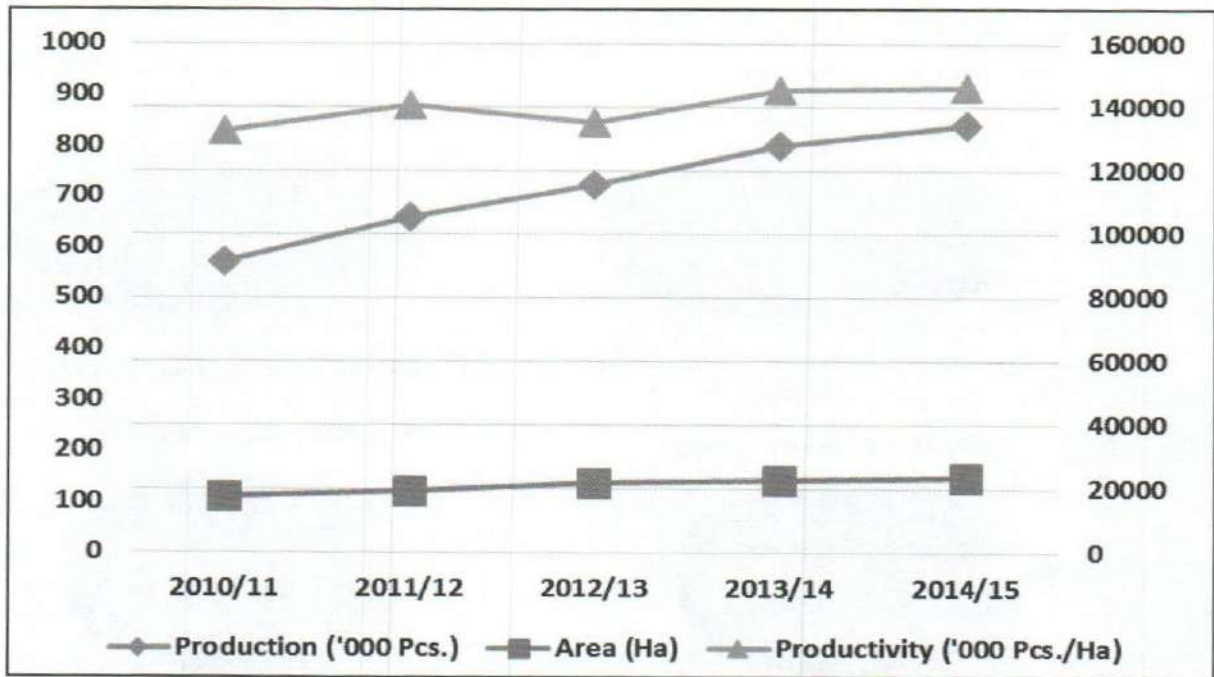


Figure 7. Trend of area, production and productivity of flowers

Situation of Horticultural Crops

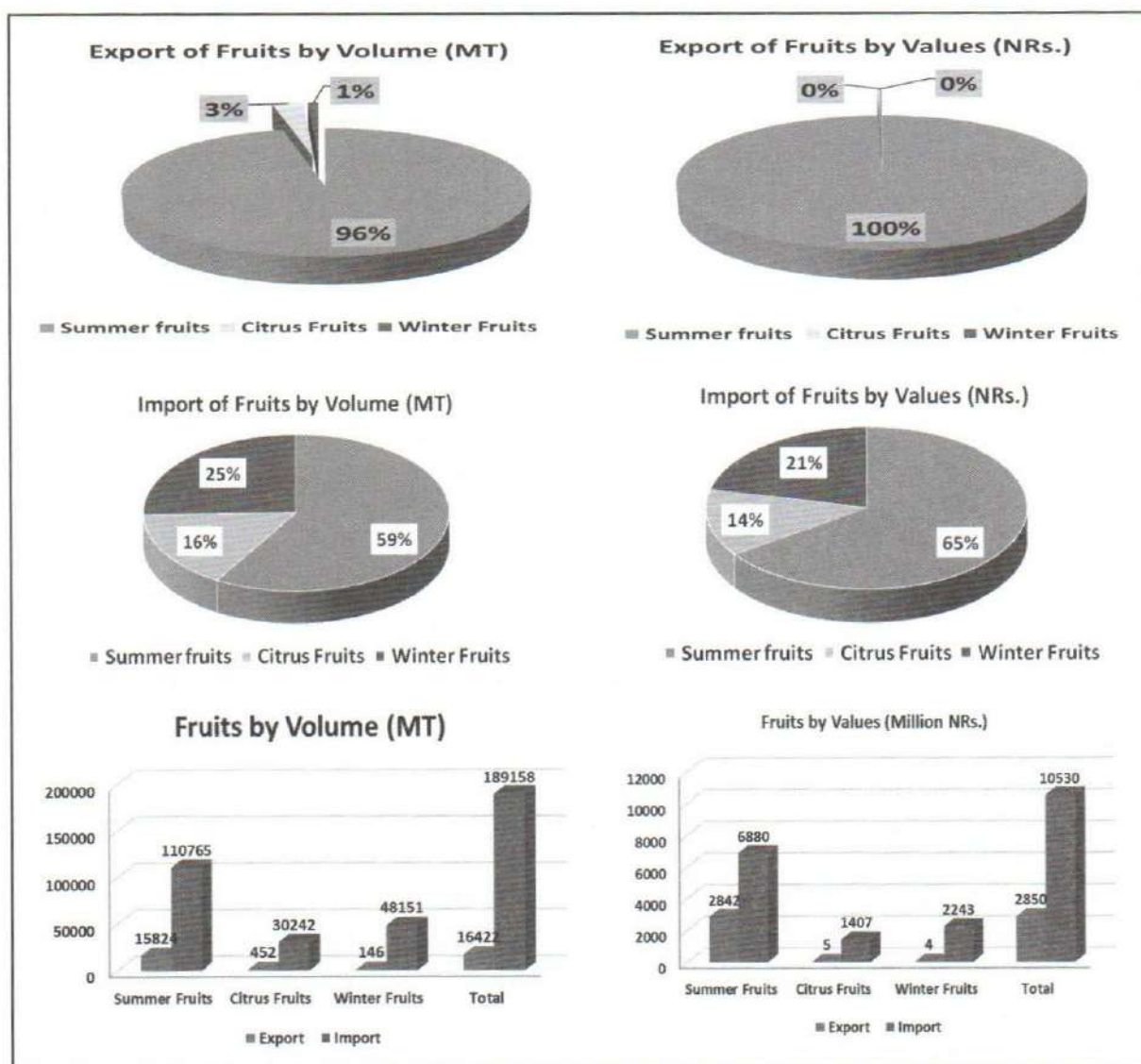
1. Export and Import Scenario of Fruits

In total export, share of summer fruits is 96% followed by citrus fruits (3%) and winter fruits (1%) by volume while by values summer fruits cover almost 100 percent and citrus and winter fruits are in insignificant amount whereas in total import, share of summer fruits is 59% followed by citrus fruits (16%) and winter fruits (25%) by volume while by values summer fruits cover 65% followed by citrus fruits (14%) and winter fruits (21%). Table 8 illustrates that the import of fruits by volume and values is more than the export which expels that this sub-sector should be emphasized.

Table 8. Import and Export of Fruits to and from Nepal

Fruits	Import		Export	
	Volume (MT)	Values (NRs.)	Volume (MT)	Values (NRs.)
Summer fruits	110765	6879595221	15824	2841629170
Citrus Fruits	30242	1406894111	452	5272891
Winter Fruits	48151	2243149422	146	3501978
Total	189158	10529638754	16422	2850404039

Source: MoAD, 2014/15



2. Export and Import Scenario of Vegetables

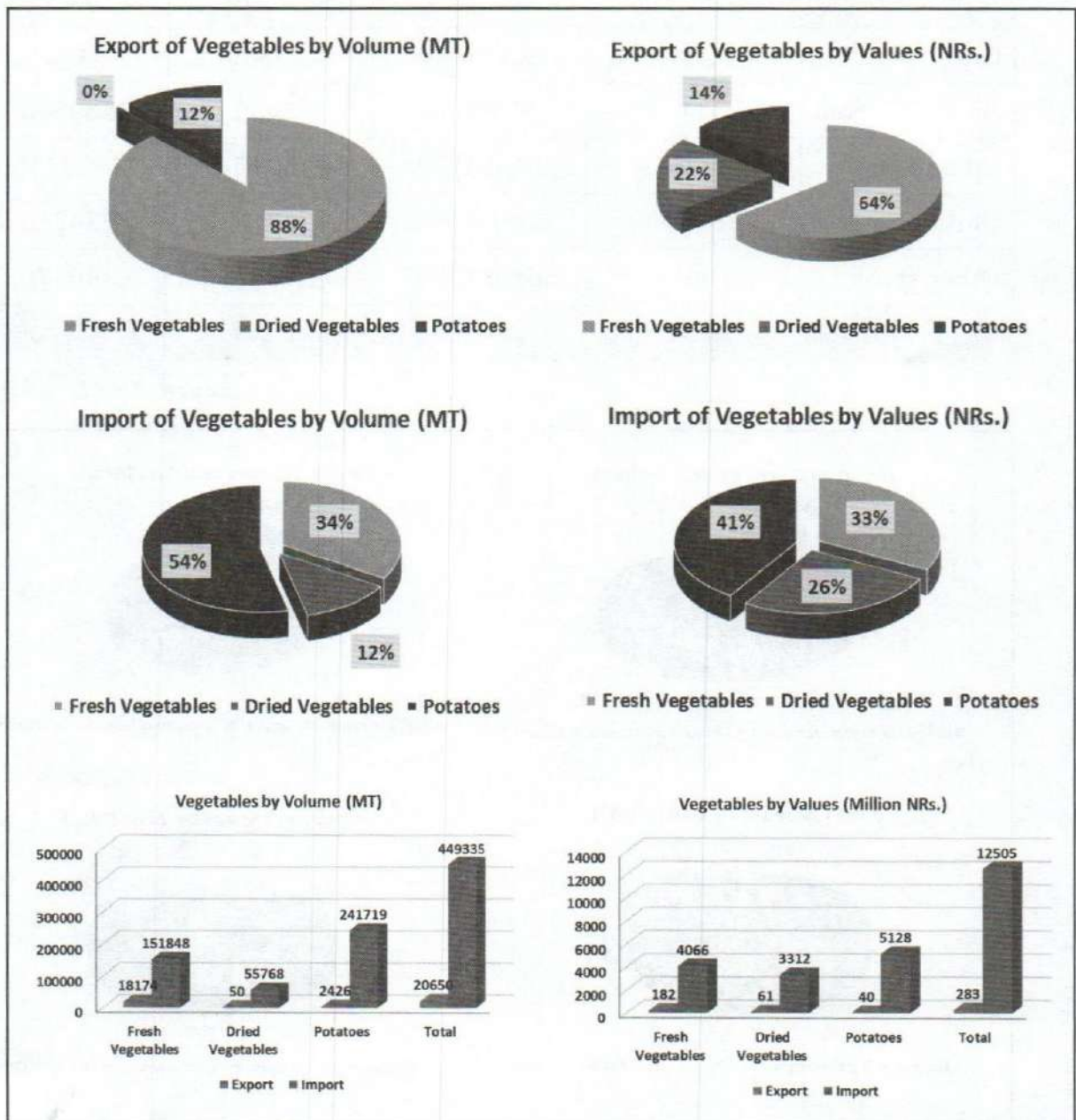
In total export, share of fresh vegetables is 88% followed by potatoes (12%) and dried vegetables in insignificant quantity by volume while by values fresh vegetables cover 64% followed by dried vegetables (22%) and potatoes (14%) whereas in total import, share of fresh vegetables is 34% followed by potatoes (54%) and dried vegetables (12%) by volume while by values fresh vegetables cover 33% followed by potatoes

(41%) and dried vegetables (26%). Table 9 demonstrates that the import of vegetables by volume and values is more than the export which interprets that attention should be paid in the promotion of vegetable sub-sector for exportable commodities.

Table 9. Import and Export of Vegetables to and from Nepal

Vegetables	Import		Export	
	Volume (MT)	Values (NRs.)	Volume (MT)	Values (NRs.)
Fresh Vegetables	151848	4065783944	18174	182120621
Dried Vegetables	55768	3311806438	50	60696953
Potatoes	241719	5127904375	2426	39945434
Total	449335	12505494757	20650	282763008

Source: MoAD, 2014/15



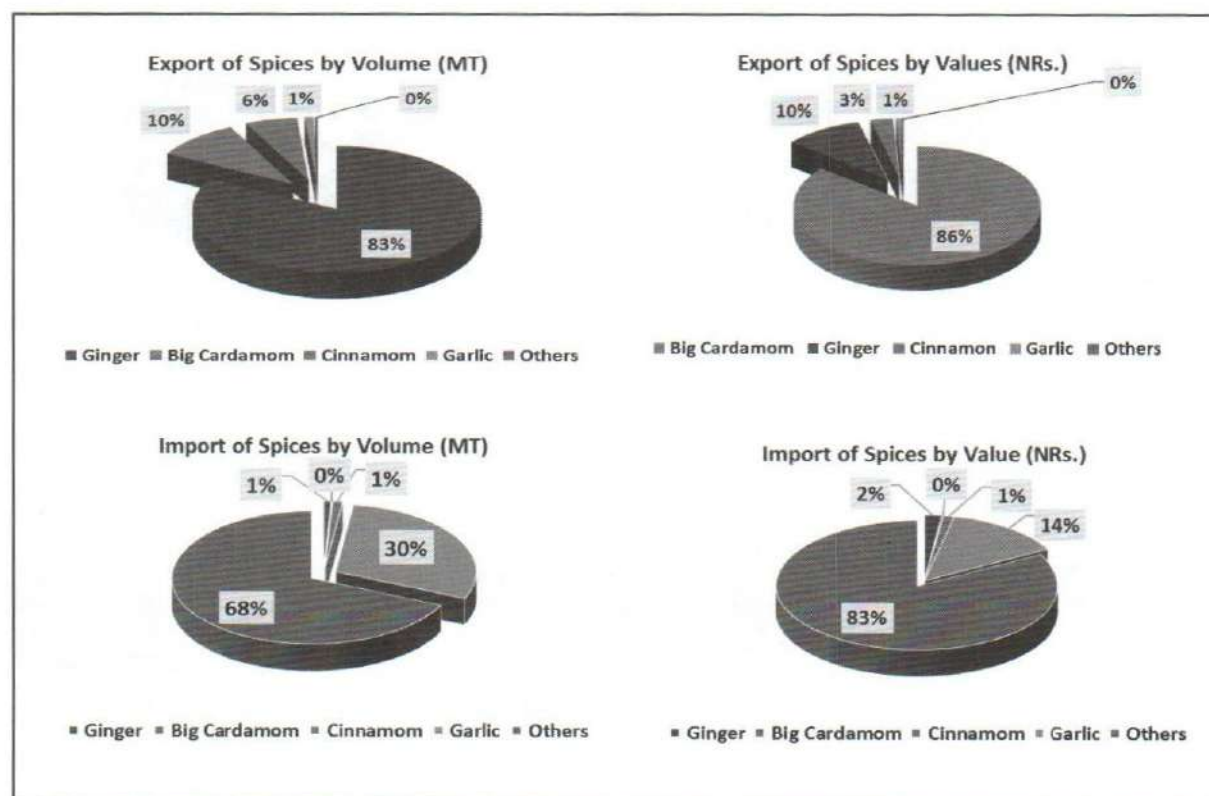
3. Export and Import Scenario of Spices

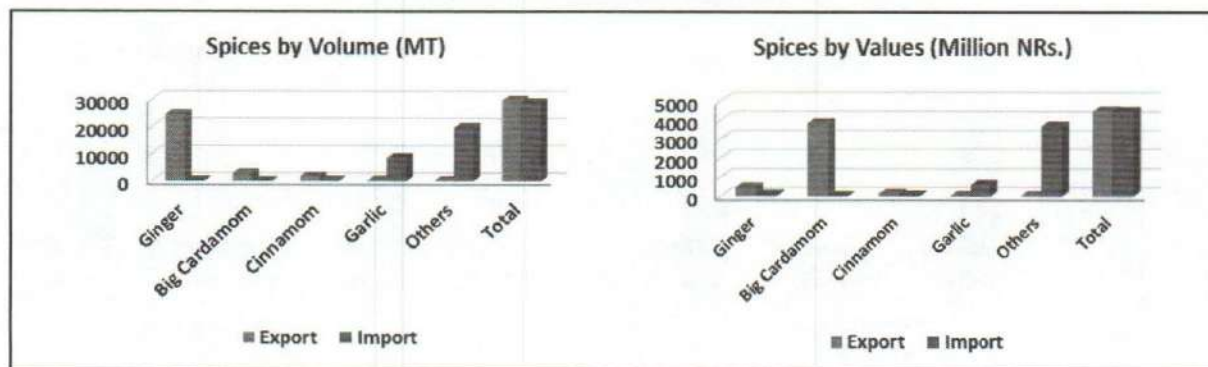
In total export, share of ginger is 83% followed by big cardamom (10%), cinnamon (6%), garlic (1%) and other spices in insignificant quantity by volume while by values big cardamom covers 86% followed by ginger (10%), cinnamon (3%), garlic (1%) and other spices in insignificant amount whereas in total import, share of other spices is 68% followed by garlic (30%), ginger (1%), cinnamon (1%) and big cardamom in insignificant quantity by volume while by values other spices cover 83% followed by garlic (14%), ginger (2%), cinnamon (1%) and big cardamom in insignificant amount. Here, other spices cover fenugreek, chillies, turmeric, pepper, coriander, cloves, cumin and small cardamom. Table 10 explains that export of spices by volume and values is little bit more than the import where big cardamom plays significant role while in the other spices sector a lot progress have to do.

Table 10. Import and Export of Spices to and from Nepal

Spices	Import		Export	
	Volume (MT)	Values (NRs.)	Volume (MT)	Values (NRs.)
Ginger	248	86951136	24549	464921376
Big Cardamom	11	8599466	2930	3839810569
Cinnamon	335	54313688	1715	132243022
Garlic	8440	599133942	287	23431038
Other spices	19611	3683313025	87	14047623
Total	28645	4432311257	29568	4474453628

Source: MoAD, 2014/15





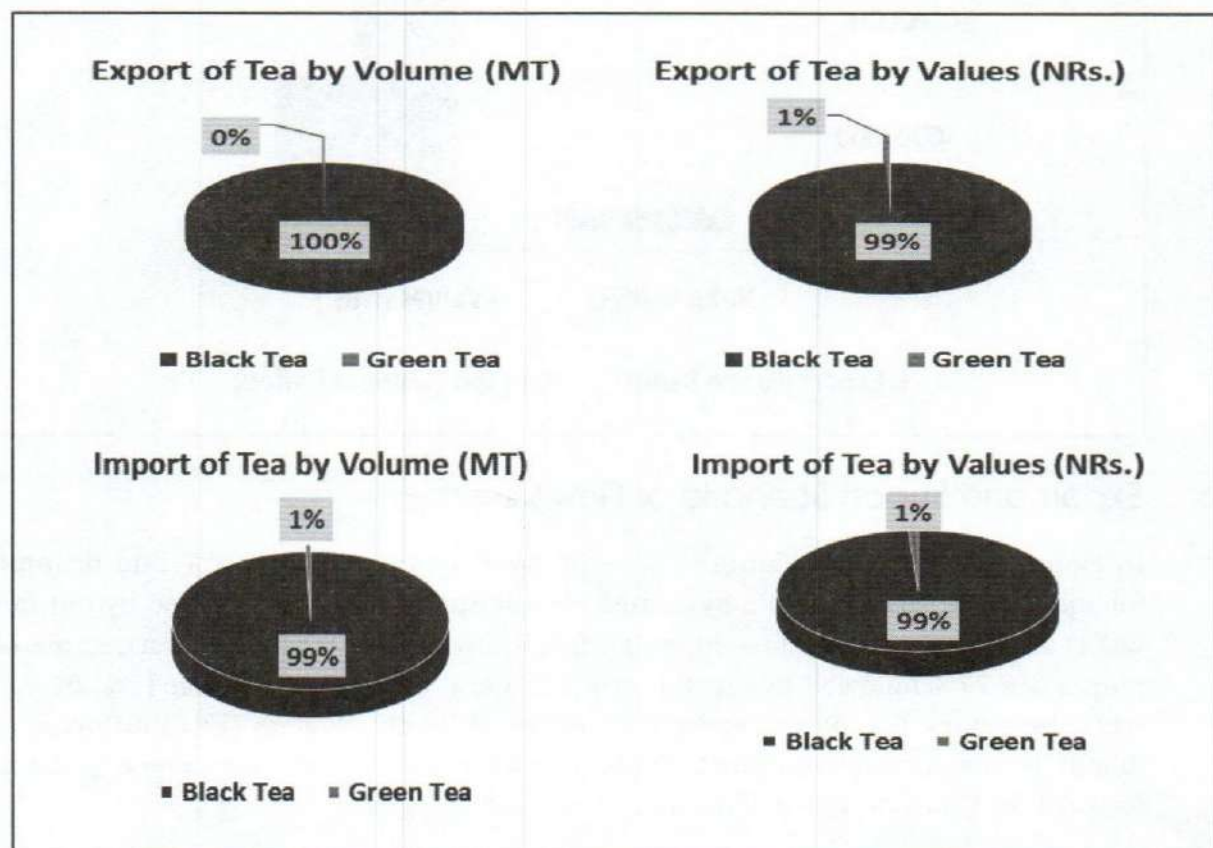
4. Export and Import Scenario of Tea

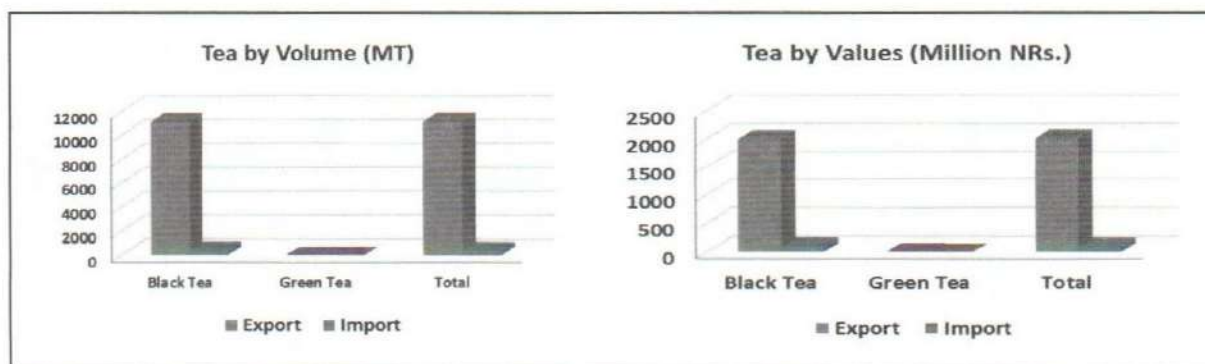
In total export, share of black tea is almost 100% where green tea is in insignificant quantity by volume while by values black tea covers 99% and green tea 1% whereas in total import, share of black tea and green tea is 99% and 1% respectively by volume and values. Table 11 shows that export of tea by volume and values is more than the import which reflects the positive sign for the development of tea sub-sector.

Table 11. Import and Export of Tea to and from Nepal

Tea	Import		Export	
	Volume (MT)	Values (NRs.)	Volume (MT)	Values (NRs.)
Black Tea	374	92760589	11120	1993529991
Green Tea	2	1002063	22	13347111
Total	376	93762652	11142	2006877102

Source: MoAD, 2014/15





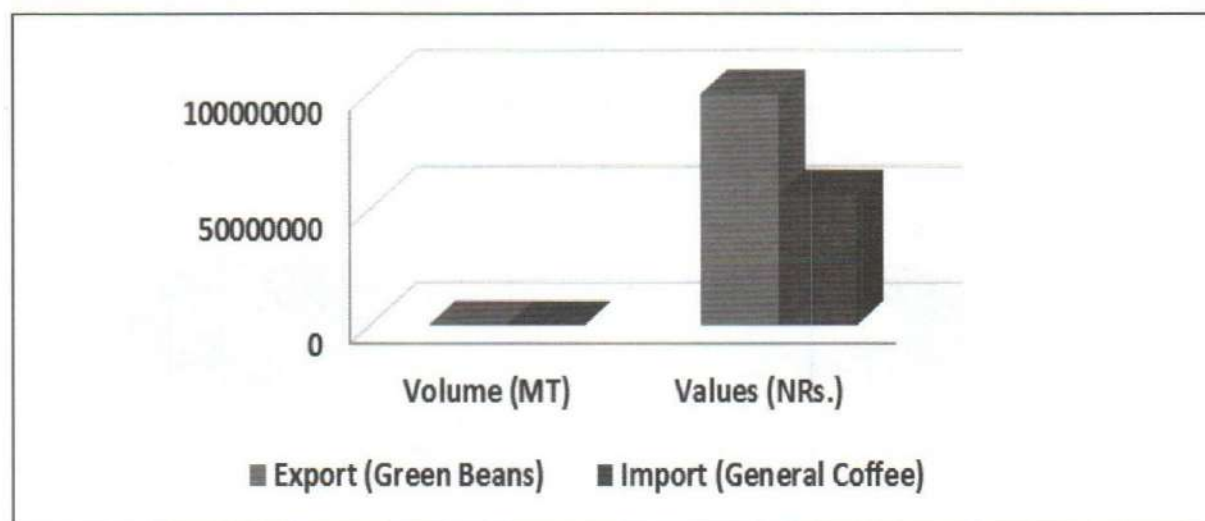
5. Export and Import Scenario of Coffee

Nepal exports green beans coffee whereas general coffee is imported in the country. In the export and import point of view the share of both types of coffee is almost same by volume while by values green beans coffee covers more than 40% in export in comparison to import of general coffee (Table 12) which is a sign of encouragement in the coffee sub-sector.

Table 12. Import and Export of Coffee to and from Nepal

Coffee	Volume (MT)	Values (NRs.)
Export (Green Beans)	100	99303979
Import (General Coffee)	111	56456160

Source: MoAD, 2014/15



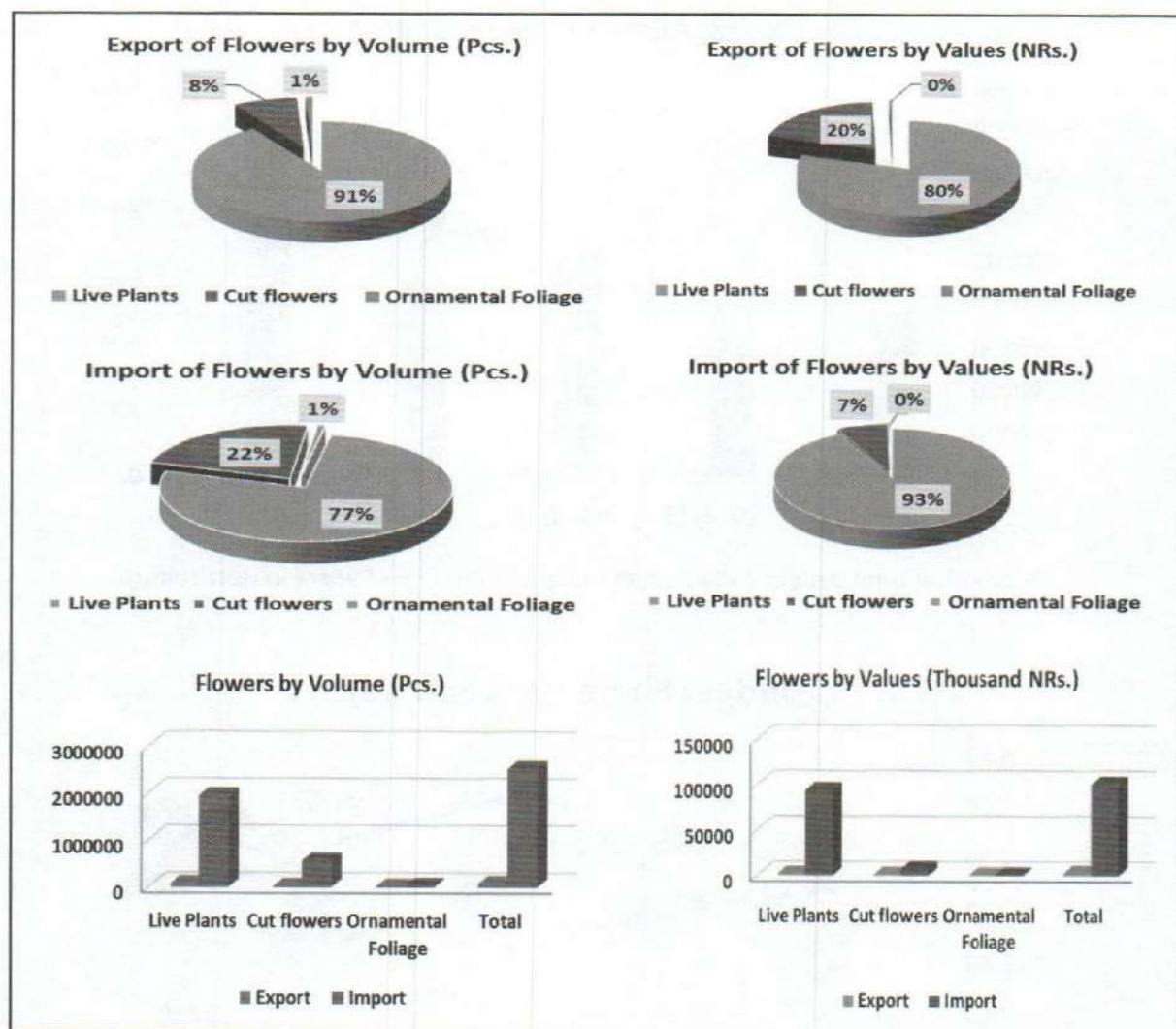
6. Export and Import Scenario of Flowers

In export, share of live plants is 91% followed by cut flowers (8%) and ornamental foliage (1%) by volume while by values live plants covers 80% followed by cut flowers (20%) and ornamental foliage in insignificant amount whereas in import, share of live plants are 77% followed by cut flowers (22%) and ornamental foliage (1%) by volume while by values live plants cover 93% followed by cut flowers (7%) and ornamental foliage in insignificant amount. Table 13 aware that much more steps to be taken forward for flourishing the floriculture sub-sector.

Table 13. Import and Export of flowers to and from Nepal

Flowers	Import		Export	
	Volume (Pcs.)	Values (NRs.)	Volume (Pcs.)	Values (NRs.)
Live Plants	1939920	93097906	62530	2023037
Cut flowers	557790	7030433	5512	506598
Ornamental Foliage	21628	321271	600	10580
Total	2519338	100449610	68642	2540215

Source: MoAD, 2014/15



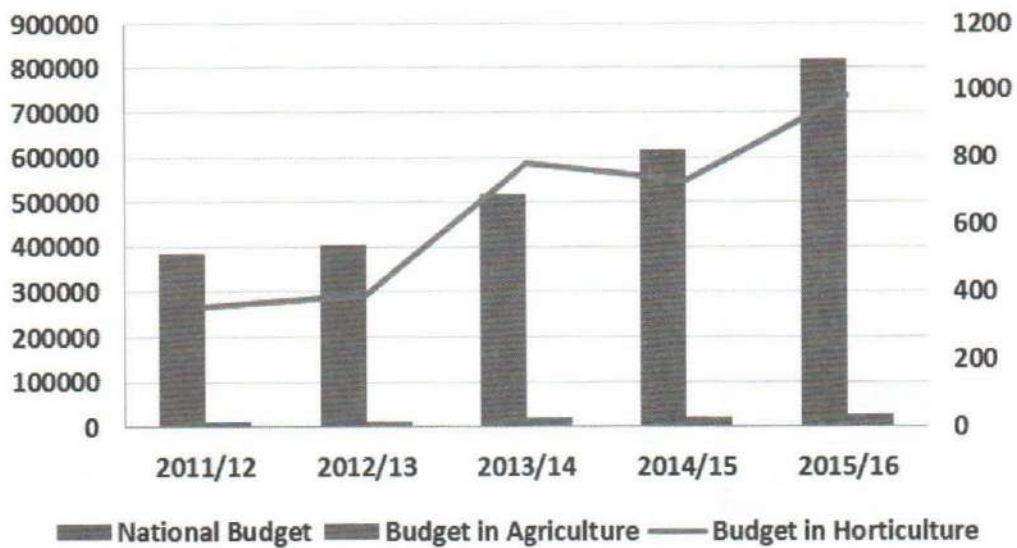
Budget Allocation

Table 14 shows the budget share of horticulture out of total agriculture budget and national budget as well. It seems that there is the increasing trend of allocated budget. From this, it can be interpreted that there is the positive signal for development of horticulture sub-sector. Figure shows the trend of budget share of horticulture and agriculture as a whole. Budget share in horticulture is in increasing trend from 2011-12 to 2013-14. However, in 2014-15 it has been decreased. In 2015-16 it has been again increased.

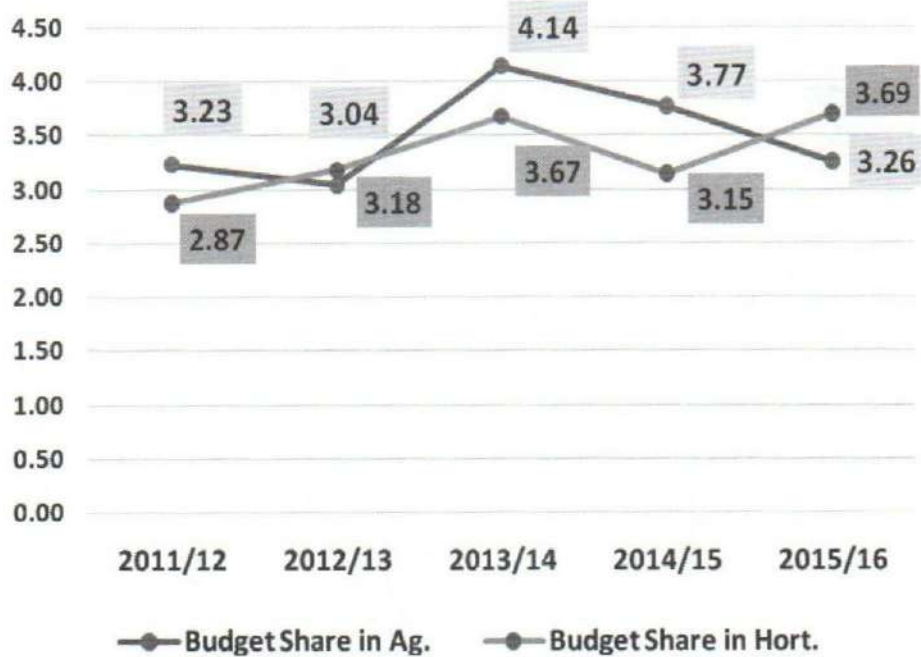
Table 14. Budget Allocation and Share in Horticulture (Million NRs.)

Year	National Budget	Budget in Agriculture	Budget in Horticulture
2011/12	384900	12431	357
2012/13	404825	12297	391
2013/14	517240	21403	785
2014/15	618000	23283	732
2015/16	819415	26683	986

Budget Allocation (Million NRs.)



Budget Share (Percentage)



Prospective of Horticultural Crops

As per Statistical Information of Nepalese Agriculture 2014/2015, Nepal's significant horticulture production is in increasing trend despite its comparatively lower productivity. Both in case of fruits & vegetables, productivity of Nepal (8.96 & 13.41 ton per hectare respectively) is lower than the productivity of China (11.6 and 23.4 ton per hectare), India (12.3 and 17.3 ton per hectare) and world average (11.4 and 19.6 ton per hectare). During 2013-14, in case of spices basically in large cardamom, Nepal's productivity (6.86 ton per hectare) was better than the China and India (3.3 and 2.0 ton per hectare respectively). Though the comparison of Nepal's horticulture productivity with that of China, the leading producer of fruits & vegetables, and India does not give identical results but there is a potentiality in case of large cardamom, tea and coffee. In case of large cardamom production Nepal's yield is best amongst the major producers.

Table 15: Global Comparison in Production & Productivity among leading producers

Crops	Current Status		Potential					
	Nepal		Production (MT)			Productivity (MT/ha)		
	Production (MT)	Productivity (MT/ha)	China	India	World	China	India	World
Fruits	992703	8.96	137066750	88977134	654449438	11.6	12.3	11.4
Vegetables	3580085	13.41	573935000	162896911	1159889787	23.4	17.3	19.6
Potatoes	2586287	13.13	92762496	41483000	NA	16.8	21.8	NA
Spices	404420	6.86	97000	1496990	NA	3.3	2.0	NA
Tea	21394	1.11	1789753	1135070	NA	1.0	1.9	NA
Coffee	464	0.19	92064	314000	NA	2.4	0.9	NA

Source: FAO Website February 2015 (Data for 2012, 2013) & For India: DAC (Data for 2013-14) for fruits & vegetables. faostat3.fao.org for potatoes, spices, tea & coffee.

Opportunities

1. Comparative Advantage

The climate in hills and mountains differ from the terai. During summer, temperature in the hills and mountains is low. Normal season vegetables in hills considered as off-season in terai and neighbouring countries. Off-season vegetables fetch higher price in the market as well. Because of diverse agro-ecological situations in the hills and mountains, different fruits, spices, flowers have niche value as well as it has comparative advantages like production season of citrus is differed from India and Bangladesh, export quality of large cardamom is produced in the eastern hills, niche type of orchids and MAPs are produced, highland specialty coffee has high demand in the international market, orthodox tea is highly appreciated in the international arena.

2. Employment Opportunity

The drain of manpower to the overseas is due to unemployment problems in the country. At present situation more than 3,000,000 youths have been deployed in the overseas in search of job. Production, processing and marketing of horticultural crops create employment opportunity to the rural and urban youths. Commercialization of horticulture crops and their value addition generate income to the people.

3. National and International Market

Nepal has been under the process of rapid urbanization. It is assumed that by 2030 about 50% of the population will live in the town and cities. This will create a high demand for agricultural commodities in the markets. At present context the import of fruits, vegetables and other high value commodities is increasing every year. Current Import scenario of horticultural crops in values are as such, apple of NRs 1.9 b, Banana of NRs 292 m, Citrus of 129 m, fresh vegetables of NRs 844 m, flowers of NRs 95 m (MoAD, 2014/15).

In some commodities where import is increasing we can substitute by producing such commodities within the country such as; mango, banana, onion, potato, chili and other vegetables. On the other hand, by utilizing diverse agro-ecology of hills and mountains we can produce various high value commodities in niche areas and export to other nations. We do have potential scope to export horticultural crops like mandarin, sweet orange, lime and arecanut in fruits; cabbage, peas and tomatoes as off-season vegetables; large cardamom and ginger in spices; tea and coffee in plantation crops; cut flower, orchid, rose and carnation in flower sub-sector.

4. Government Policies and Plans

Government of Nepal has always prioritized for horticulture development in periodic plans. In the 20 year Agriculture Perspective Plan (APP, 1994/95-2014/15), government outlined the broad policy to transform subsistence agriculture into commercial one and priorities given to the horticultural crops such as apple in mountain; citrus, coffee, tea and vegetable seeds in mid-hill and mango, banana and fresh vegetables in terai. The policies emphasize to facilitate market oriented high value commodities, contribute internal and export markets through agro-based industries and poverty reduction through commercialization of horticulture.

Likewise, government formulated Nepal Trade Integration Strategy (NTIS) in 2010, which identified seven agro-food i.e., ginger, tea, large cardamom, lentil, honey, noodles and medicinal herbs for export potentialities, out of which three are horticulture commodities.

The government has endorsed Agriculture Development Strategy (ADS) in 2015 with the vision of a competitive, sustainable inclusive agriculture sector that contribute to economic growth, improved livelihood, and food and nutrition security. It will accelerate agriculture sector growth through four strategic components including improved governance, productivity, commercialization and competitiveness. Priority is given to inclusiveness (both social and geographical), sustainability (both natural resources and economical) and connectivity to market infrastructures (agricultural roads, collection centers, packing houses, market centers etc.), information infrastructures and ICT, and power infrastructure.

5. Identified Pocket Districts

The climate of teari, mid-hills and higher mountain are suitable for the production of many kinds of fruits and high value horticulture commodities. Suitable pocket areas for important horticultural crops has been identified and listed below:

- Mango: Siraha, Sarlahi, Mohattari, Dhanusa, Kapilvastu, Dang, Banke, Bardia
- Banana: Jhapa, Morang, Sunsari, Chitwan, Nawalparasi, Kailali, Kanchanpur
- Papaya: Jhapa, Morang, Sunsari, Saptari, Siraha, Dhanusa, Mahottari, Rautahat, Bara, Parsa, Chitwan, Rupandehi, Kapilvastu, Banke, Kailai, Kanchanpur
- Arecanut: Jhapa, Morang, Sunsari
- Mandarin: Dhankuta, Panchthar, Bhojpur, Khotang, Dhading, Tanahun, Gorkha, Kaski, Lamjung, Syangja, Palpa, Gulmi, Salyan, Dailekh, Baglung, Doti, Dadeldhura
- Sweet Orange: Sindhuli, Ramechhap, Dhankuta, Doti, Dadeldhura, Darchula, Panchthar, Illam, Okhaldhunga, Udaypur
- Lime: Terahthum, Panchthar, Dhankuta, Kavre, Dolakha, Dhading, Makawanpur, Palpa, Lamjung, Tanahun, Doti, Dadeldhura, Dailekh, Syangja, Myagdi, Parbat
- Pomegranate: Ramechhap, Nuwakot, Dhading, Makawanpur, Sindhuli
- Kiwi: Dolakha, Ramechhap Ilam, Dhankuta, Kavre
- Apple: Jumla, Kalikot, Mustang, Manang Dolpa, Humla, Mugu, Bajhang, Bajura, Baitadi, Darchula
- Vegetables: Dhankuta, Morang, Jhapa, Sunsari, Sarlahi, Bara, Parsa, Dhading, Kavre, Nuwakot, Chitwan, Dang, Banke, Kailali, Kanchanpur
- Cardamom: Ilam, Panchthar, Taplejung, Terhathum, Sankhuwasava, Bhojpur, Dhankuta
- Tea: Ilam, Jhapa, Morang, Panchthar, Dhankuta, Dolakha, Sindhupalchowk
- Coffee: Syangja, Gulmi, Palpa, Arghakhachi, Kavre, Baglung, Parbat, Myagdi, Kaski, Lalitpur
- Cut-flowers: Kathmandu, Bhaktapur, Lalitpur, Kavre, Dhading, Chitwan, Makawanpur, Dhanusa, Palpa

Challenges

Despite of greater scope and potentiality there are various constraints for the production of horticulture crops commercially, some of them are as follows:

1. Subsistence Farming:

Farming system in Nepal is conventional and subsistence type. Each farmer grows most of the crops as per need of his family. The scattered form of farming imposed a greater constraint in marketing of horticultural crops. From sustainable point of view growing all crops is important. For commercial production it should be specialized to particular crop. The low volume of products and absence of consolidated marketing system create the great setback for export.

2. Lack of systematic marketing system

In Nepal marketing system is a major problem. Farmers are encouraged to grow vegetables, fruits and high value crops without sustainable market and marketing system. Productions without market create embarrassing situations to the growers and discourage production. Producers face problems due to lack of transportation facilities such as marketing of apple from mountain regions i.e., Humla, Jumla, Manang, Mustang; citrus fruits in the mid-hill regions.

3. Lack of Physical Infra-structure

In remote areas inaccessibility to the road is the major problem to produce horticultural commodities. The production of most of the fruits is seasonal in nature. The production areas are in remote and the bulk of production is confined to a particular limited time. Bulk production of seasonal crops in a limited period leads to fetch poor market price due to lack of proper storage and processing units. Lack of cleaning, grading, sorting, fumigation, waxing and other packing house operations decrease export quality of the horticultural products. In many instances, inferior qualities are processed to different product such as juice, jam jellies and beverages. In some crops production without processing is useless such as coffee, tea etc. Because of growing transaction the size of existing market has squeezed and is not enough.

4. Lack of Technical Know-how

Commercial producers do not have the knowledge about the physiology of produce yet. Farmers are not aware about potential shelf-life, postharvest loss during transportation and handling. Producers are not conscious for probable increase in price after storage, grading, sorting and packaging processes. Lack of know-how about improved production technology, postharvest handling and processing leads hard to compete in the market.

5. Human Resource Management

In Nepal the well trained manpower are not enough. There is lack of subject matter specialists (SMS) in spice crops, tea, coffee and floriculture sub-sector. In the field of postharvest handling and processing of horticultural crops skilled manpower is still lacking. Overseas job creates shortage of youth labor in the country as well. Due to foreign job migration of people from rural areas to urban areas is in increasing trend.

6. Low Priority in Investment

Poor economic status of Nepalese people cannot support big projects of commercial production and processing of horticultural crops. Inadequate investment of government in horticulture sector is also a great challenge. Foreign investor or donors have less priority in fruit and flower sub-sector for investments. In addition, they are not assured for their investments.

Conclusion

- Big production blocks should be created and strengthened in fruit sub-sector.
- Emphasis should be given to niche fruit production in larger areas.

- Hybrid varieties of commercial vegetables need to be developed.
- Sanitary and phyto-sanitary (SPS) measures should be followed for exportable commodities.
- Processing units should be established for the promotion of ginger production.
- Demand of coffee is high but the production is in small scale so areas of plantation need to be expanded.
- Demand of green tea in international market is high so production should be increased with quality enhancement.
- Storage facilities should be established for year round supply and price stabilization.
- Capacity of the frontline extension workers need to be strengthened.
- There should be a policy for the assurance of foreign investors.
- Foreign aid/investment need to be mobilized through single door policy.
- Subsidy and grant should be provided to the farmers based on output.
- Effective implementation of Crop insurance policy (75% subsidy in premium) and subsidized agriculture loan (@6% interest rate) facilities.

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