

Horticulture Development in Nepal: Prospects, Challenges and Strategies

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Abstract Nepal has different ecological belts endowed with different types of climates due to its geographical locations for the production of horticultural crops. Government organizations were not in existence for the development of horticulture sector before 1950, yet growing of fruits, vegetables, spices and flowers started from time immemorial in private sector. 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. There is tremendous scope for commercial horticultural crops production to enter into the international market. Due to subsistence farming system, poor infra-structure, transportation facilities, linkage to the international market and technical know-how, horticulture development could not gain momentum as expected. The productivity of horticultural crops comparing with two giant neighboring countries i.e. China and India does not give matching results but in case of spices especially in large cardamom, Nepal's productivity is higher than these two countries. Large cardamom, ginger, tea and coffee have played significant role in trade balance while in case of fruits, flowers and some of the fresh vegetables Nepal faces still trade deficit.

Keywords Infrastructure, Niche Product, Indigenous, Exotic, Export, Import, Trade Balance

1. Introduction

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, Agriculture Diary 2015 [1]. In altitude ranges from about 60 m above mean sea level in the Terrain (*Kechna Kabal, Jhapa District*) in the South-East to

8,848masl 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. It has favorable agro ecological diversity for agricultural production, especially in the horticulture sector. Different ecological belts are endowed with different types of climates due to its geographical locations. Most of the important fruits, vegetables, spices and flowers of the world can be grown in this country. Three distinct seasons experienced 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 plantation crops. Nepal is rich in biodiversity as wild plants of mandarin in *Mangtewa*, custard apple in *Dhankuta* in the east while *Amla* (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, NHS 2016 [6].

Horticulture development at the government level started during sixties when the Horticulture Division was created in the newly established Department of Agriculture in 1952. Many farms were established during sixties, commodity development divisions were established in seventies, agricultural research was given a special focus and a separate research wing named Nepal Agricultural Research Council (NARC) was formed in the year 1993, Poudyal et al. [7].

In the last sixty years, there have been significant progresses in policy development, institutional development, and technology generation and transfer. With Nepal's membership to WTO and regional trade associations, increasing education levels and nutrition knowledge of the people, increasing demand and import of horticultural commodities shows high prospects for horticulture development and 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

processed products. In Nepal, 65.5% population are engaged in agriculture and its contribution to national GDP is 31.23% where horticulture sub-sector has the most significant role in AGDP which shares 21.42 percent, MOAD 2015 [5].

2. Historical Background

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. Government organizations were not in existence before fifties, 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, fenugreek; flowers like marigold, cactus, wild rose etc. Similarly, fancy and exotic horticultural plants such as persimmon, loquat, peach, pear and fig; flowering plants like coral, magnolia, China rose, and evergreen plants like exotic pines, monkey puzzle plants etc. were collected and grown in *Putali Bagaincha*, Kathmandu.

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). German government (GTZ) supported Gandaki Zone Agriculture Development Project (GADP) was started in 1969 that had a significant component on horticulture development. Similarly, Japan government (JICA) 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* district of Nepal. Food and Agriculture Organization (FAO) supported Hill Agriculture Development Project (HADP) was started in 1973 strengthened the established horticulture farms of Nepal. Karnali Bheri Integrated Rural Development (KBIRD) Project supported by Canadian government (CIDA) included the horticulture component in their programs. British government (UK/ODA) supported Koshi Hill Rural Area Development Project (KHARDEP) was started in 1981 and has the impact in orchard development in citrus and vegetable seed production in the east. JICA supported Horticulture Development Project (HDP) was started in 1985 to develop fruit sub-sector in the central region of Nepal whereas ADB supported Hill Fruit Development Project (HFDP) was started in 1987 to develop citrus fruit in the eastern mid-hill region of Nepal. 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. Tea and Coffee Development Board was

established in 1993 to develop tea and coffee sub-sector in the country.

Then onwards there have not been major changes in the organizational setup but there are ongoing projects implementing by Ministry of Agricultural Development: High Value Agriculture Project for Hill and Mountains (HVAP) with the financial support of IFAD for the value chain development in apple, off-season vegetables, ginger, turmeric and vegetable seeds; Project for Agriculture Commercialization and Trade (PACT) with the financial support of WB for the commercialization of coffee, cardamom, ginger, fresh vegetable, and kiwi; Raising Income of Small and Medium Farmers Project (RISMFP), Hill and Mountain Agricultural Livelihood Improvement Project (HIMALI) and Rani Jamara Kuleria Irrigation Project (RJKIP) and other non-governmental organizations are also involving to develop the whole horticulture sector, NHS 2016 [6].

3. Situation of Horticultural Crops

3.1. 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)	Productivity (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, 2005/06-2014/15 [5]

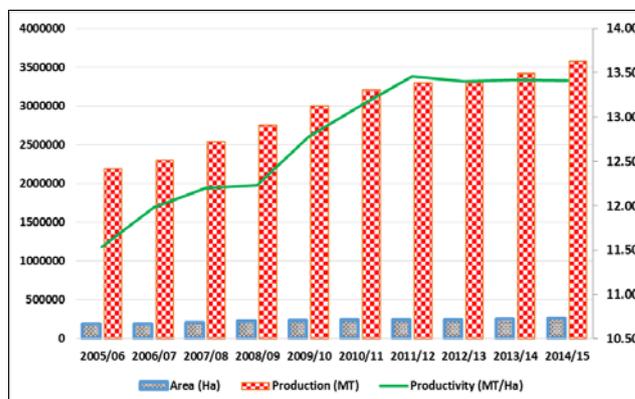


Figure 1. Trend of area, production and productivity of vegetables

3.2. 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, 2005/06-2014/15 [5]

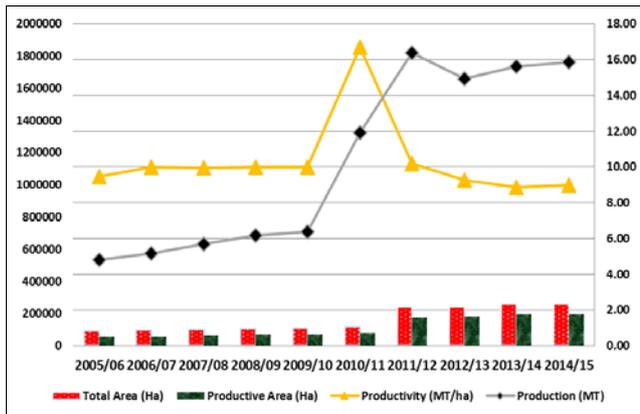


Figure 2. Trend of area, production and productivity of fruits

3.3. Potatoes

During last 10 years, area and production of potatoes have been increased by about 31% from 150,864 to 197,037 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)	Productivity (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, 2005/06-2014/15 [5]

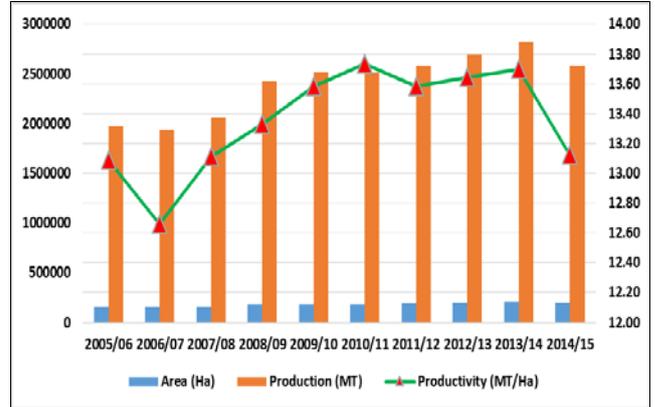


Figure 3. Trend of area, production and productivity of potatoes

3.4. 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, 2005/06-2014/15 [5]

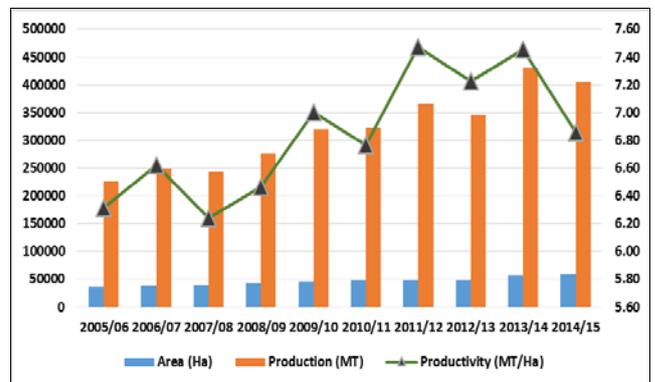


Figure 4. Trend of area, production and productivity of spices

3.5. Tea

During the last 5 years, area of tea has increased by about 50% from 17,451 ha in 2010-11 to 26,165 ha in 2014-15 whereas the production has increased by about 33% from 17,438 MT in 2010-11 to 23,187 MT in 2014-15 as shown in table 5 and figure 5.

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

Year	Area (Ha)	Production (MT)	Productivity (MT/Ha)
2010/11	17451	17438	1.00
2011/12	18149	18726	1.03
2012/13	19036	20588	1.08
2013/14	19271	21394	1.11
2014/15	26165	23187	0.89

Source: MoAD, 2010/11-2014/15 [5]

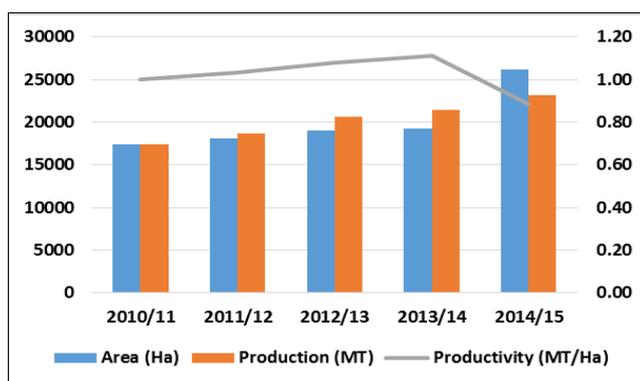


Figure 5. Trend of area, production and productivity of tea

3.6. Coffee

During the last 5 years, area of coffee has been increased by about 49% from 1,752 ha in 2010-11 to 2,618 ha in 2014-15 whereas the production (green beans) has been increased by about 8% from 402 MT in 2010-11 to 434 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)	Productivity (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	2618	434	0.17

Source: MoAD, 2010/11-2014/15 [5]

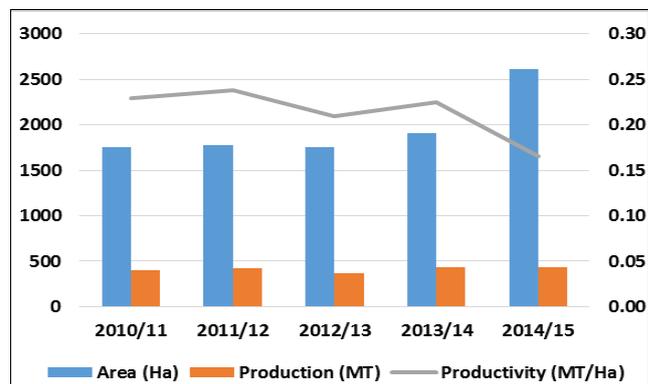


Figure 6. Trend of area, production and productivity of coffee

3.7. 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, 2010/11-2014/15 [5]

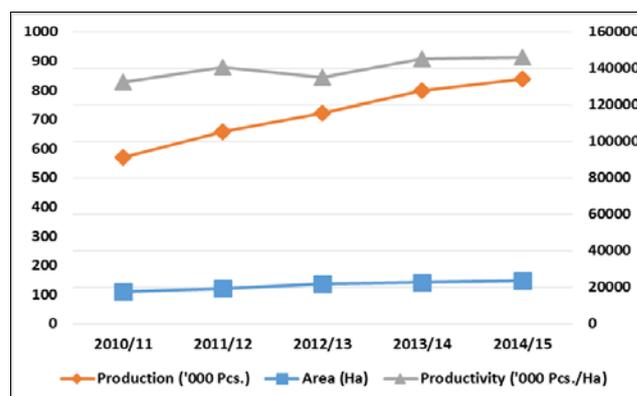


Figure 7. Trend of area, production and productivity of flowers

4. Export and Import Scenario

4.1. 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.

4.2. 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.

4.3. 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 of progress have to be performed, Thapa et al. [8].

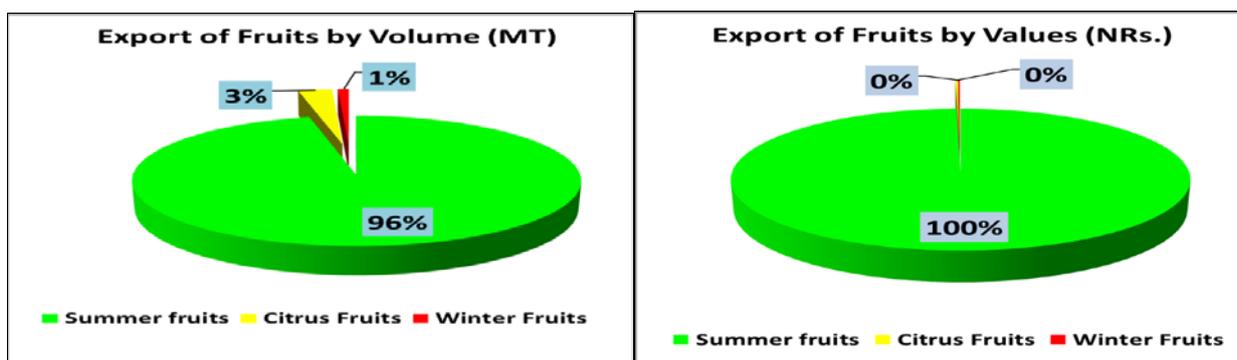
4.4. Tea

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 8. Import and Export of Fruits to and from Nepal

Fruits	Import			Export		
	Volume (MT)	Values (Million NRs.)	Values (Million USD)	Volume (MT)	Values (Million NRs.)	Values (Million USD)
Summer fruits	110765	6879.60	67.45	15824	2841.63	27.86
Citrus Fruits	30242	1406.89	13.79	452	5.27	0.05
Winter Fruits	48151	2243.15	21.99	146	3.50	0.03
Total	189158	10529.64	103.23	16422	2850.40	27.95

Source: SINA 2015 [4]



(NRs. = Nepalese Rupees)

(1USD ≅ 102 NRs.)

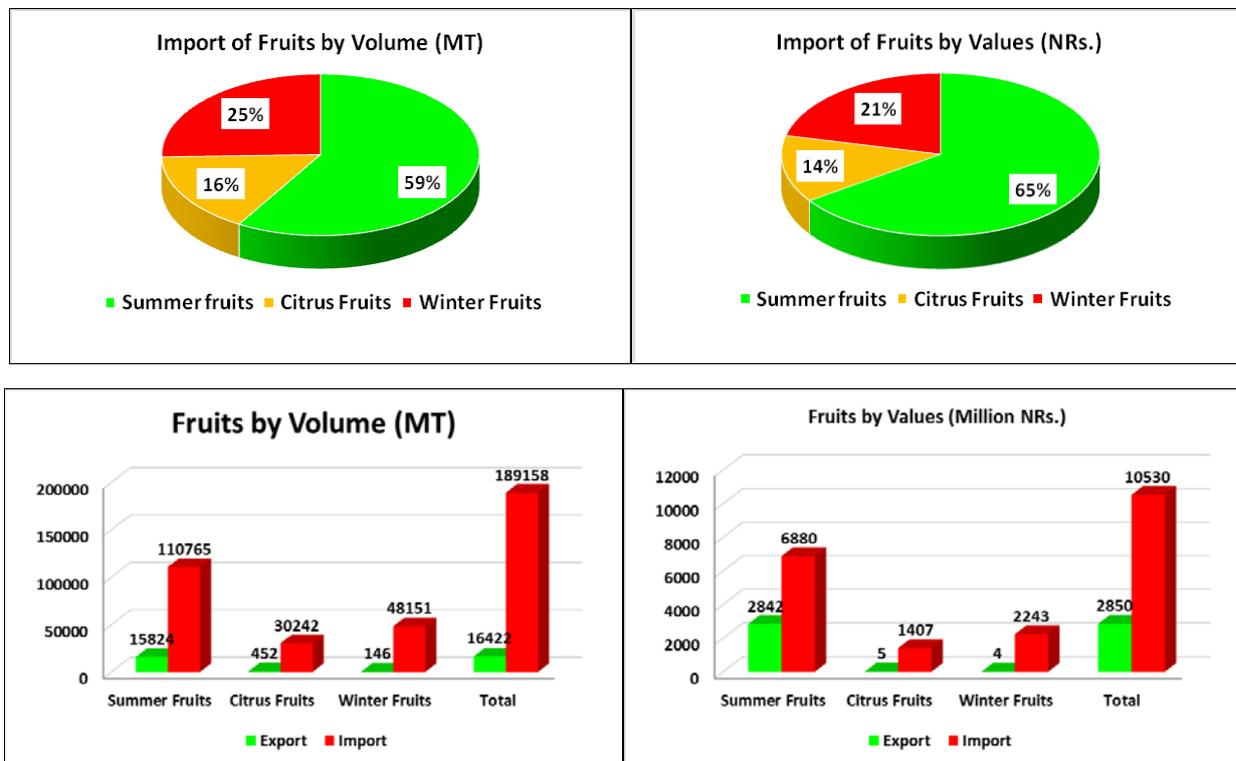
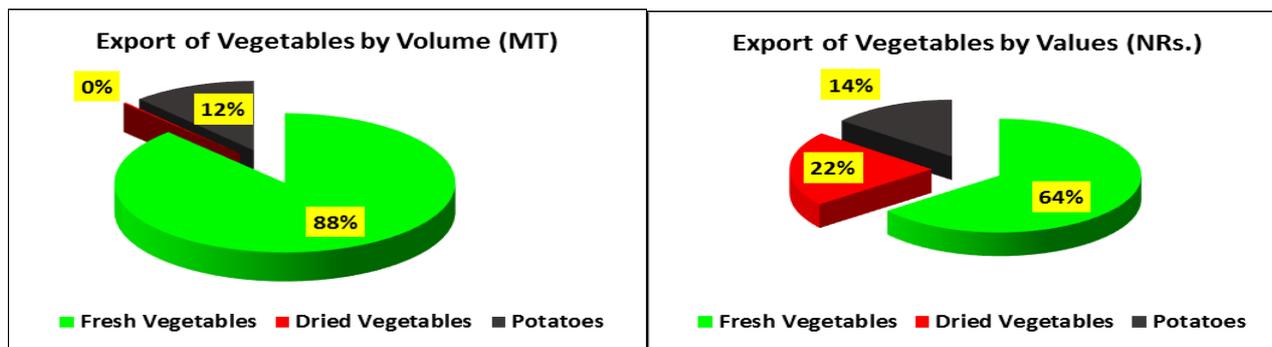


Figure 8. Export and import of fruits by volume and values

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: SINA 2015 [4], (1USD \cong 102 NRs.)



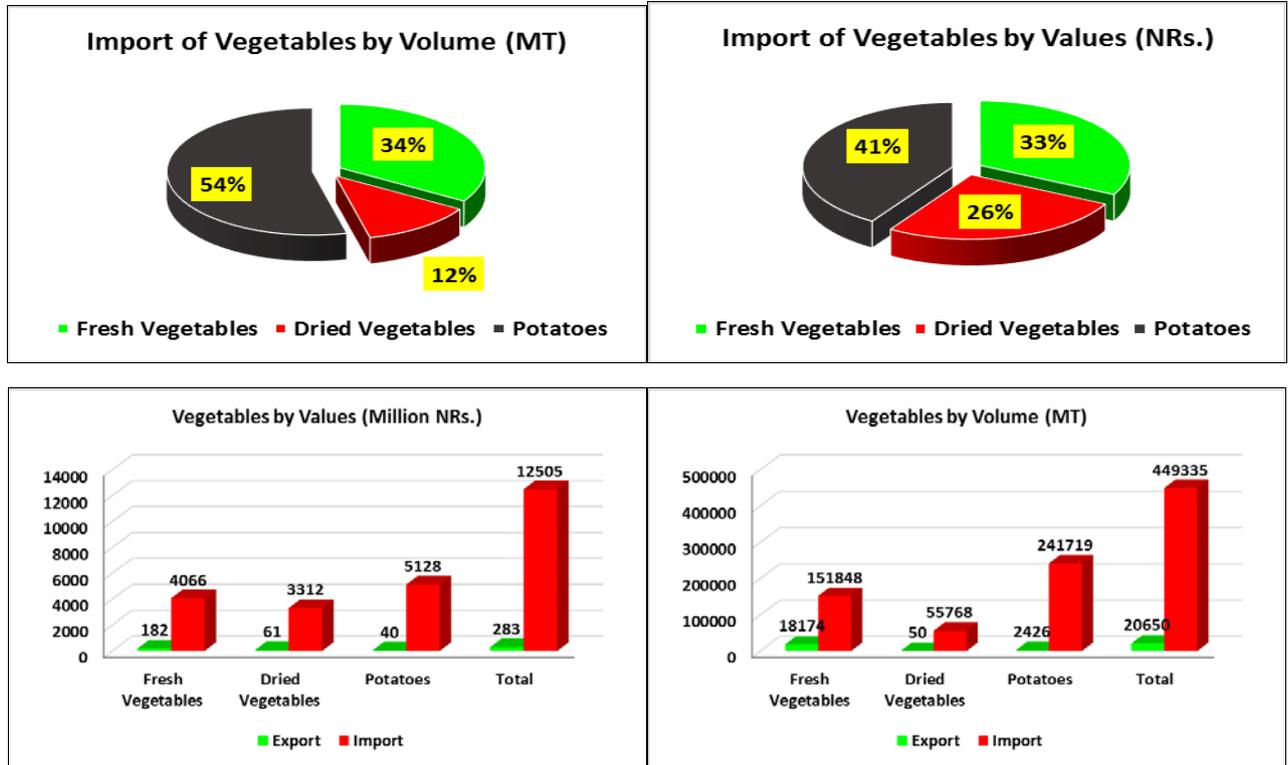
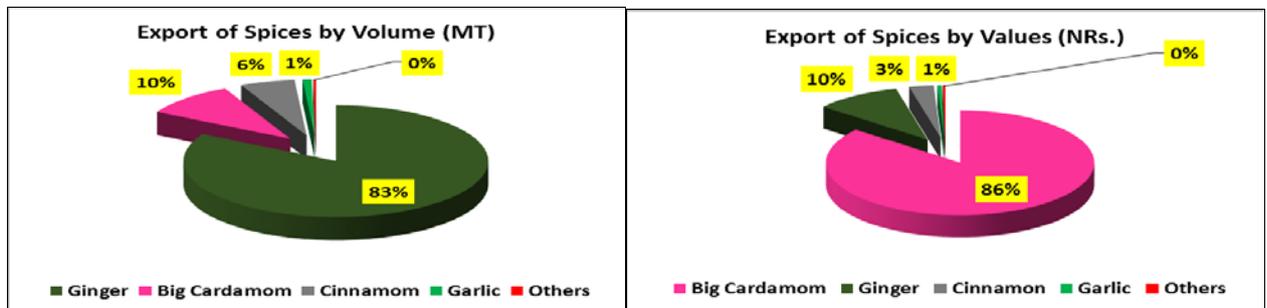


Figure 9. Export and import of vegetables by volume and values

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: SINA 2015 [4], (1USD ≈ 102 NRs.)



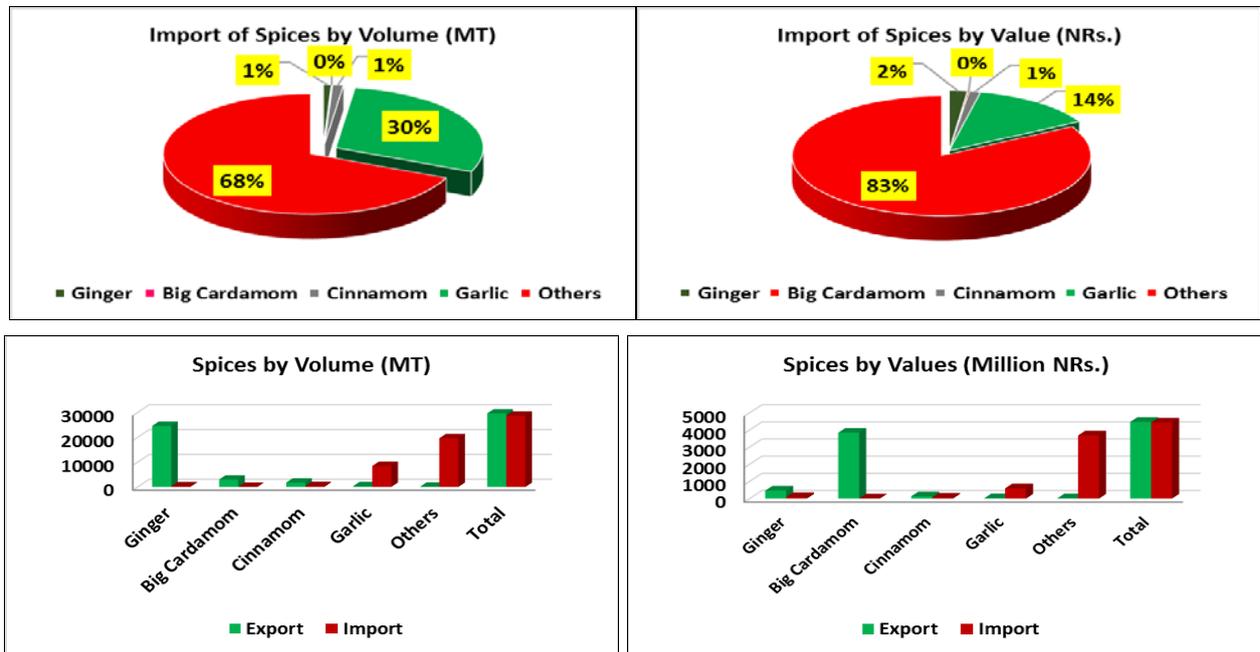
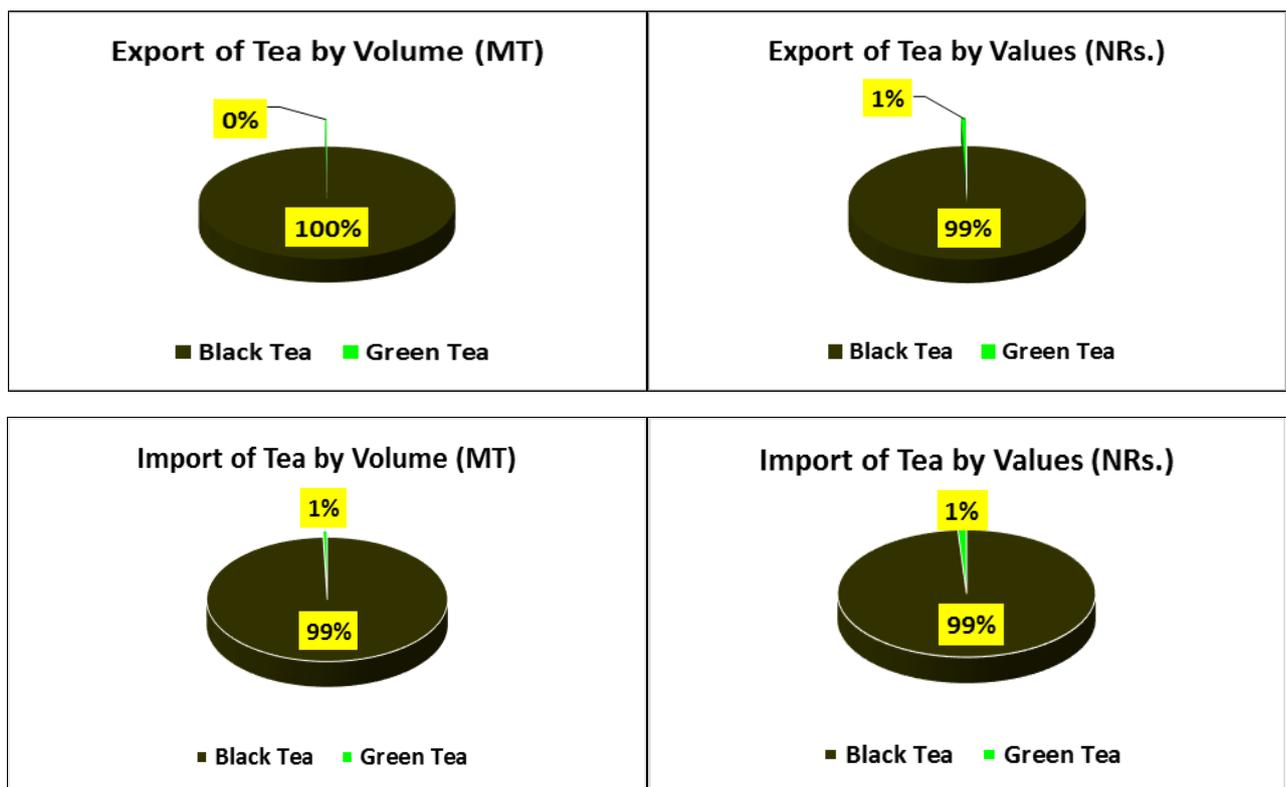


Figure 10. Export and import of spices by volume and values

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: SINA 2015 [4], (1USD \approx 102 NRs.)



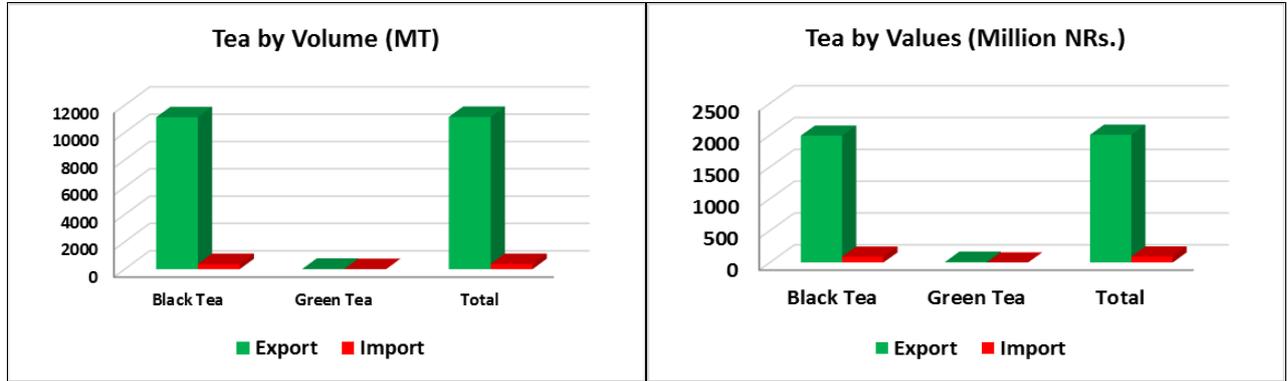


Figure 11. Export and import of tea by volume and values

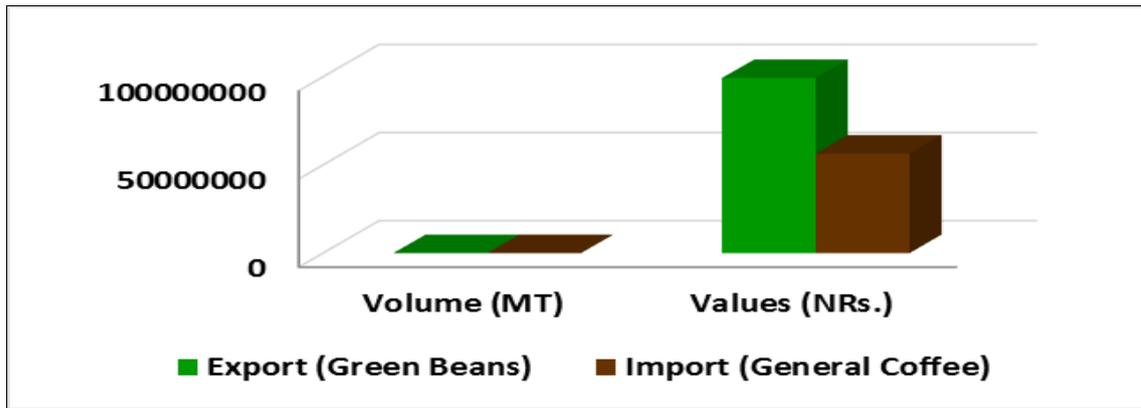


Figure 12. Export and import of coffee by volume and values

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: SINA 2015 [4], (1USD \cong 102 NRs.)

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: SINA 2015 [4], (1USD \cong 102 NRs.)

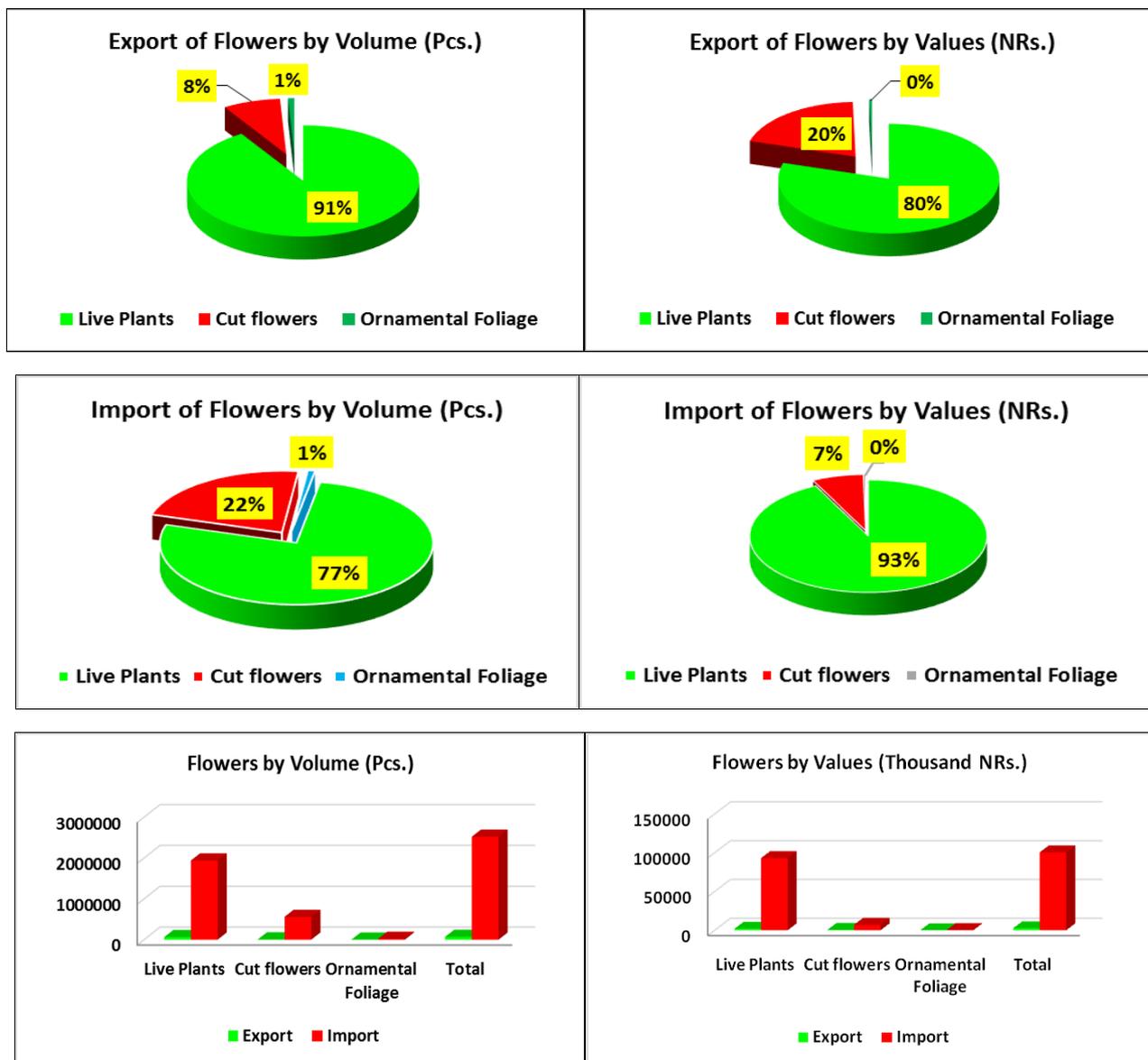


Figure 13. Export and import of flowers by volume and values

Table 14. 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	23187	0.89	1789753	1135070	NA	1.0	1.9	NA
Coffee	434	0.17	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 [9] for potatoes, spices, tea & coffee.

4.5. 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.

4.6. 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.

5. Prospects

5.1. Comparative Advantage

The climate in hills and mountains differ from the terrain. During summer, temperature in the hills and mountains is low. Normal season vegetables in hills considered as off-season in terrain and neighboring 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 highland specialty coffee has high demand in the international market, orthodox tea is highly appreciated in the international arena, Gautam, D. M. [3].

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) are 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 the best amongst the major producers (Table 14).

5.2. 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, Gautam, D. M. [3].

5.3. 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.

In some commodities where import is increasing it can be substituted 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 various high value commodities can be produced in niche areas and export to other nations. Nepal does have potential scope to export horticultural crops like mandarin, sweet orange, lime and areca nut 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, SINA 2015 [4].

5.4. 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 terrain. 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, ADS 2015 [2].

5.5. Identified Horticultural Crops

The climate of terrain (lower belt), mid-hills and high hills are suitable for the production of many kinds of fruits and high value horticulture commodities such as mango, banana, papaya, areca nut, tea, cut flowers, vegetables and potatoes in terrain; mandarin, sweet orange, lime, pomegranate, kiwi, coffee, tea, large cardamom, ginger, cut-flowers, vegetables and potatoes in mid-hills and apple, walnut, apricot, peach, pear, plum, vegetables and potatoes in high-hills, Gautam, D. M. [3].

6. Challenges

Despite of greater scope and potentiality there are various constraints for the production of horticulture crops commercially, Gautam, D. M. [3]:

6.1. 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.

6.2. 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 high hill regions and citrus fruits in the mid-hill regions.

6.3. 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.

6.4. Human Resource Management

In Nepal the well trained manpower are not enough. There is lack of subject matter specialists (SMS) in spice crops, tea, and coffee 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.

6.5. 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 sub-sector for investments.

7. Strategies

The government of Nepal has made efforts to promote the horticulture sector in short as well as in long term plans, yet some deficiencies are experienced which are to be addressed in future:

- Emphasis should be given to niche fruits, plantation crops, flowers and spice crops production in larger areas.
- Research institutes should be strengthened to develop the hybrid varieties of horticultural crops especially vegetables.
- Big production blocks should be created and strengthened in fruit sub-sector.

- The plantation areas of tea and coffee should be expanded because demand of coffee (green beans) and green tea in international market is high.
- Processing units should be established for the promotion of ginger, areca nut and large cardamom.
- Big storage house facilities should be provided for year round supply and price stabilization.
- Capacity enhancement for the horticulturists and frontline extension workers need to be strengthened.
- Foreign aid/ investment need to be mobilized through single door policy.
- Implementation of crop insurance policy should be assured to commercial farmers.
- Sanitary and phyto-sanitary (SPS) measures should be followed strictly for exportable commodities.

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