

# Floriculture Development in Nepal

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## Introduction

The start of floriculture in Nepal although began during mid-forties yet the development of this sector was very slow. This is the phase (1945-1985) when nursery enterprises started increasing slowly within Kathmandu valley but were mostly un-organized. The main products were several types of ornamental plants and seasonal. During this phase, seasonals were mostly produced within Nepal but ornamental plants were imported from India. The point of sales was mostly done at the farm gate. The phase (1985-1995) is the time when commercial floriculture in Nepal went through huge changes. This is the phase when cut flower (*Gladiolus*) was commercially cultivated for the first time in Nepal. The other major milestone of this phase is the establishment of Floriculture Association of Nepal (FAN) in 1992 with support from Agro Enterprises Center (a joint project of United States Aid for International Development (USAID) and Federation of Nepalese Chambers of Commerce and Industry (FNCCI). The formation of FAN resulted into more organized and systematic development of floriculture in Nepal. This phase began the start of annual floriculture trade fair, listing of growers, trainings and documentation of floriculture activities in Nepal. In this phase, the total number of flower growers was 80.

The phase (1995-2005) began the start of the introduction of several cut flowers in the country, multi-location trial of these cut flowers, establishment of retail florist shops, establishment of wholesale shops. This is also the phase that has revolutionized commercial cut flower production and retail sales in Nepal. This is also the phase when floriculture industry in Nepal made a significant sales growth from Rs. 10 million/annum to more than Rs. 200 million. The number of growers increased to 525 in this phase.

The current phase (2005-to date) is highlighted by the rapid growth of retail shops, wholesale shops, establishment of export oriented unit (EOU), introduction of new cut flowers and foliage. The major achievement of this phase is exportation of cut flowers (rose) from Nepal and incorporation of floriculture sector under Ministry of Agriculture.

## Current Status of floriculture in Nepal

Floriculture in Nepal has made tremendous progress over the last two decades and is steadily growing. The number of firms (600), number of retail sales (54), number of wholesales (6) and total turnover is Rs. 230 million (estimated 2006) the annual sales increment on an average is 10% per annum. The present status of floriculture development in Nepal is as presented below.

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## **1. Area and Production**

### **a. Major production belts/zones**

The major production of ornamental plants, cut flower and cut foliage is distributed from the southern plains of the country to hills of the north. However, the major districts growing these crops are Chitwan, Makwanpur, Rupendehi, Jhapa, Sunsari and Mahotary (plains) Kathmandu, Lalitpur, Bhaktapur, Dhading, Kavare, Nuwakot, Kaski (hills). However, the major production belts are located in the central region (Nepal is divided into five developmental regions) except for limited production in the eastern and western region. The other regions, mid-western and far-western regions are not very important region from floriculture perspectives. The production zones ranges from the tropics to sub-tropics to warm temperate. Currently, warm temperate climate is the most important flower production zone that produces not only the maximum quantity but also the maximum diversity of products.

### **b. Major crops/products**

The major floriculture products of Nepal can categorized as below.

#### **i. Cut flowers:**

Cut flowers production in Nepal started during the late eighties despite of the fact that Nepal was opened to tourist during the early fifties and several hotels were developed to cater to the big rush of the tourist. Prior to the start of cut flowers production in Nepal, cut flowers were imported from India, Singapore, Thailand etc. The first cut flower commercially produced in Nepal was Gladiolus and even after two decades, it is still the number one cut flower of Nepal. The major cut flowers of Nepal are Gladiolus, Carnation, Rose, Gerbera etc.

#### **ii Cut foliage:**

The use of cut foliage started with the beginning of retail florist during 1996. Florist started using foliage as part of a bouquet and in table arrangement. This service is getting more popular and creative. The most popular cut foliage are Nephrolepis (fern), Asparagus, Eucalyptus gunni, E. pelvurelata etc.

#### **iii Seasonal:**

This is still the major products in the domestic markets. Majority of flower grower's deal with this product and the demand is ever increasing. This is also the product that is consumed all over the country. The popularity of landscaping has also significantly contributed towards the increase in the consumption of seasonals. In Nepal, seasonals are primarily categorized into summer and winter flowering seasonals.

#### **iv. Potted flowering plants:**

The use of these plants primarily as outdoor plants is common practice in Nepal. Interestingly, this is also gaining popularity and will remain for few more years. Some of the important plants in the category are: Azaleas, Bougainvilleas, Hibiscus, Brunfelsia etc

#### **v. Potted foliage plants**

Majority of indoor plants falls under this category. The uses of such plants are also in an increasing trend and remain for many years. Some of the important plants in this category are: Philodendron, Monstera, Aspidistra, Dieffenbachia etc

#### vi. Shrubs:

The major consumers of these plants are landscapers. Rapid urbanization and development of housing colonies in Nepal has significantly boosted the demand for such plants. Some of the important plants in this category are: Bougainvillea, Hibiscus, Nerium, Mahonia etc.

#### vii. Trees:

This is another category of plants, the demand of which has been boosted by development of landscaping business in Nepal. The landscaping business is primarily developed in Kathmandu valley but in recent days it is also gaining popularity in other major towns of Nepal. Some of the important ornamental trees of Nepal are: Jacaranda, Silver Oak, Maples, Thuja etc.

#### c. Total production area (protected, open and crop wise):

The area under floriculture is increasing over the years. The first record of estimation of area under floriculture was done in 1994 and total area under cut flowers and nurseries was 23 ha (Table 1). This area increased over the years and when a decade later areas under cut flower was estimated it covered about 38 ha. Large areas were under open cultivation and only 0.6 ha was under protection. In a recent survey, almost 40% of the area under cut flower was under protection. The area under all cut flowers increased over the years (Table 2)

Table1: Total production area under floriculture

Year	Total Area (ha)	Remarks	Under protection (Ha)
1994	23	Total area under floriculture	NIL
2002	37.5	Total area under cut flowers	0.6
2007	80	Total area under cut flower	30.0

Source: FAN

Table 2: Total production area under different cut flowers (ropanis) 1ropani=508sq.m

Cut flowers	1992-93	1998-99	2003-04	2007-08	Remarks
Gladiolus	10-15	120	350	345	Open cultivation
Carnation				30	Semi-protection
Rose	5	50	135	255	Protection, semi-protection, open
Gerbera				20	Semi-protection
Tuberose		30	50	10	Open cultivation

Source: FAN

#### d. Total production (crop/product wise)

The production of all cut flowers grew steadily till 2005 with decline in 2007 (Table 3)

Table3: Total production of cut flowers in Nepal (in thousand)

Cut flowers	1999	2001	2003	2005	2007
Gladiolus	142.7	123.0	377.5	403.0	354.2
Carnation	3.2	22.2	33.2	133.9	113.6
Rose	51.28	77.6	249.5	133.4	120.6
Gerbera	0.8	1.3	4.1	98.9	54.6

Source: FAN

## 2. Planting materials

Planting materials for most of the flowers are imported. This includes cut flowers, seasonals and other ornamentals. The only flowers for which planting materials are not imported are traditional flowers. These are flowers that were and are cultivated in Nepal (traditional flowers) since time immemorial and have been twined with religious ceremonies. Two of the most important flowers in this category are Gomphrena (Makhamali) and Tagetes (Syaapatri) species. Since last decade, improved hybrids of Tagetes are being imported for pot plants and garlands.

### a. Sources (public/private)

The major sources of planting materials in Nepal are the private sectors. There is no role of the public sector enterprises in this sector. Some of the private sectors providing this service are:

- Seeds
  - i) Standard Nursery/Crop Protech/Devtech
  - ii) Karma and Sons
  - iii) Flora Incorporate
  - iv) Kumari Flora Firm
- Planting Materials for cut flowers
  - i) Crop Protech/Devtech
  - ii) Flora Incorporate
  - iii) Kumari Flora Firm
  - iv) Direct import by growers
- Plants: Perennial / Ornamental: Indian hawkers, representatives of Indian companies, retail shops and nurseries.
- Bulbs Corms and Tubers: Indian hawkers and direct imports by the growers

### b. Quality assurance

The assurances are guaranteed by the companies through their agents in Nepal. The major commodities of planting materials imported in Nepal are for seeds of seasonal and cut flowers. The quality of these products is found quite satisfactory. Flower seeds are imported directly from Europe, the USA, Japan and Thailand where as seedlings/cuttings for cut flowers are imported from Europe or from their subsidiary in India. The quality of bulbs, corms and tubers supplied by Indian hawkers are sometimes not as per the specification. The most common problem is reliability of getting planting materials of specified cultivar in Gladiolus.

### c. Access to new varieties

The Nepalese flower growers do not have satisfactory access to new varieties, this is perhaps because Nepal is a small market and the floriculture sector is small. The growers have access to only those varieties that are supplied by the international companies having local agents. Some of the international companies with local agents are Kanko Seeds, Sand G, PanAmerican Seeds, Florsnova, Bodger Seeds Ltd, Barberet and Blanc, KF Florist etc.

### d. Plant quarantine

The Nepalese government through the department of agriculture provides plant quarantine services at all major port of entry/exit in Nepal. There is a plant quarantine office at the Tribhuvan International Airport for incoming products and such offices are located in all the entry/exit point of Nepal towards India and China.

### **3. Production inputs (sources and access)**

#### **a. Fertilizers**

The farmers have well recognized that there is a scope for increasing the yield of flower crops with the balanced use of both organic and chemical fertilizers. As a campaign to promote sustainable agriculture, bio-fertilizers such as composts, organic manures and vermin-culture easily collected from farm yard or from local farmers, are in increasing uses, particularly for commercially grown vegetables, fruits and flowers. Demand for more organic fertilizers is expected to grow exponentially.

Few years back major policy reforms were undertaken by the Government whereby the fertilizer sub-sector was deregulated, fertilizer subsidies removed, and the private sector allowed to freely import and distribute fertilizers. Chemical fertilizers imported and supplied by the Agriculture Input Company Ltd. (AICL) and other private sector importers are sold in the local markets. Farmers of flowers and ornamental plants are using DAP, Urea, MOP, Calcium nitrate, potassium nitrate and micro nutrients.

#### **b. Plant protection materials**

Broad based pesticides and fungicides are used in controlling pests and diseases. Such materials are easily available in the local markets and agro-vets retailers are also found selling them along with seeds, equipment and fertilizers. Neither grower nor the pesticide dealers are aware of specific pesticides/fungicides requirement of some of the flower crops and for some specific conditions. Beside these, imports of some of the chemicals, like Methyl Bromide that is required for soil sterilization, but these are band by state regulations. Some of these chemicals such as potassium and calcium nitrates, which are normally used in making explosives, are subjected to Home Ministry's special clearance permit to the Customs. The growers requiring small quantities of such chemicals occasionally suffer from costly and time consuming administrative procedural delays and hassles.

#### **c. Greenhouse structure and accessories**

The use of greenhouse for protected cultivation is on the rise since cut flowers production started in Nepal. However, most of the greenhouses constructed in Nepal are semi-protected type with no heating and cooling facilities. These greenhouses use only UV protected plastic sheets on all sides of a greenhouse. The Government of Nepal reduced import duty to only 1% in 2001 on greenhouse structure and accessories to facilitate protected cultivation in greenhouses for quality production. However, the vast majority of cut flowers growers could not benefit from this facility because the large number of growers did not construct hi tech greenhouses. This facility was beneficial to one EOU (Export Oriented Unit) growing high quality cut rose flowers in 4 ha hi tech greenhouse.

#### **d. Water management systems and accessories.**

At present about 33 per cent of cultivated land areas have access to irrigation facility. Surface irrigation, through tube well, cannel, pounds, and tanks, is a common practice in cultivation system of Nepal. Controlled irrigation system is not normal. Sprinkler irrigation is found sparsely but drip irrigation is being used by few firms. Though the operation cost is very low, the growers find hard to afford initial heavy investment required for drip irrigation system and are expecting government supports for it.

Some attempts are underway to introduce micro irrigation (sprinkler, drip irrigation) and low cost water saving devices (water storage tanks, hybrid irrigation systems). Agriculture Development Bank (ADB/N), and USAID have been the agencies promoting the mini/micro sprinklers irrigation and drip irrigation method in a small scale in Nepal in the past. The drip and sprinkler technology promoted have proven to have water application efficiency in an order of 75% or more compared to 20 to 50 % in other conventional surface irrigation (IDE, 2002).

#### **4. Production technology support (public and private)**

Floriculture in Nepal was initiated and led by the private sector. Floriculture until 2006 was under Ministry of Forest and Soil Conservation. It was only in 2006, that Floriculture was shifted under Ministry of Agriculture and Cooperatives. The Department of Agriculture has created Floriculture Development Center (FDC) at Godavari to initiate development of floriculture from the public sector.

##### **a. Research and Development infrastructure**

Currently, research in floriculture is done at the Tribhuvan University Institute of Agriculture and Animal Science, Nepal Agriculture Research Council and the private sectors including Floriculture Association of Nepal. Research facility is adequate for field based research at all the above institutions but facility for postharvest research is not adequate. There is lack of controlled environment and good analytical laboratory.

##### **b. Floriculture extension services**

The role of government agencies such as the Department of Agriculture in extension services is not adequate. Although, commercial production of flowers is currently done in more than 35 districts yet due attention from government agencies is lacking. Extension service is currently carried out by the local agents of international flower company for their clients who buy seed or seedlings/cuttings from their parent company.

#### **5. Production systems**

##### **a. Good agriculture practices (GAP)**

Floriculture firms in Nepal are generally small (less than 0.25ha) and therefore it is generally owner operator with additional labour support of family members. The use of harmful chemicals is limited and the use of inorganic fertilizers is usually balanced with organic manures.

##### **b. Average farm size**

The average farm size of cut flower producer is less than 0.25 ha. However, if the nursery group is considered, more than 90% is on a lease land of around 500sq.m.

##### **c. Contract/Cluster farming**

This is a new concept in Nepal that is being followed by a group of farmers who are supplied seedlings/cuttings of cut flowers from the same company. In this case, the planting materials supplier in some case arranges buy back arrangement for the cut flowers. In a similar way, Cymbidium orchid growers of Godavari area have formed a cluster group to share information and regulate marketing to get fair price and prevent glut in the market.

#### **d. Exported oriented production**

Nepal has only one export oriented rose production unit and is called Everest Floriculture Private Limited based in Kathmandu. This is located on the north-east side of Kathmandu and has hi tech glasshouses under 4ha area. This unit is fully climate controlled and feeds its plants through drip system. It grows nine cultivars of roses and exported about 1.5 million cut roses during the year 2008-09. This unit exports roses to Japan and the middle-eastern countries.

### **6. Manpower**

#### **a. Availability of skilled manpower**

There is shortage of skilled manpower in this sector. This could be due to number of factors such as agriculture graduates aspiring for government or non-governmental jobs, opting for higher studies overseas. In contrast, the job at a floriculture company is demanding but pays relatively less than above sectors. The lower pay in these companies perhaps could be due to the size of operations. Besides, in most of the firm the owner and operators are the same persons. However, recently agriculture technicians are hired as farm supervisor who look after the technical part of the farm operation. Agriculture technician course is a two years agriculture course after high school approved by Council for Technical Education and Vocational Training, Government of Nepal. There are only very few companies that have hired agriculture graduates with major in horticulture/floriculture.

#### **b. Training programs**

The Floriculture Association of Nepal (FAN) in collaboration with Floriculture Development Center of the Department of Agriculture, Government of Nepal conducts special training programs in various areas. These trainings are mainly focused for owner/operator, technical staff of a firm and in some cases individuals interested in training of this sector. Some of the training conducted recently is Nursery management, Effective plant protection, Floral decoration etc.

#### **c. Gender distribution**

The actual gender distribution pattern has not been surveyed. However, it is generally agreed that more than 60% of the total workers involved in this sector is women. The domination of women workers is more in a farm whereas more man works as independent gardener giving gardening services to individual and corporate houses on a daily basis.

#### **d. Wage structure**

The wage pattern differs from company to company and with the experience and skill of an individual. However, there is difference in wage (man getting 15-20% more) due to gender as observed in other labour oriented enterprises. This is because men are given tougher jobs as compared with women. However, this becomes irrelevant when an individual is skilled or is educated.

## **II Postharvest management**

### **a. PHM infrastructures at farm/community level**

In majority of small cut flower growers, there is no postharvest storage at the farm. Generally, cut flowers are harvested either early in the morning in summer or in the evening in winter. Grading, bunching or storing (stems dipped in water) is done in the collection store under

ambient temperature before transporting to the flower wholesale market. In Nepal, hi tech cold storage for cut flowers is available at Everest Floriculture Private Limited, Kathmandu (it the only EOU unit in Nepal) and can accommodate about 80000 to 100000 cut flowers at a time.

#### **b. Grades/standards**

There is no strict grading system in Nepalese cut flower industry for domestic market. The domestic wholesale market however encourages growers to bunch cut flowers or foliages in 20 or 25 depending on the commodity. Recently however, the industry leaders are voicing to introduce grading system soon on the line of the international practices. This could be a preparation for exportation of other potential cut flowers such as carnation, cymbidium etc from Nepal. The EOU unit that supplies roses grades its products as per international norms.

#### **c. Packaging system and materials**

The packaging system of cut flowers and cut foliages is very simple for domestic market. In general, cut flowers/foliages are bunched in 20 or 25 and bound with rubber band and depending on types of product 10-15 bunches are again wrapped with newspapers and a single bundle is made. When Gladiolus are transported from the plains (Chitwan and Makwanpur; distance about 180-220km from Kathmandu) especially in early summer, 30-40 bunches of gladiolus is bound with wet jute cloth. Gladiolus being geotropic, needs to be bound tightly when transported to prevent bending. The EOU unit practices international norms of sleeving each bunch, separating layers with soft paper and packed in an aerated corrugated card board boxes. These materials are locally made in Kathmandu.

##### **• Transportation modes**

In Nepal transportation of cut flowers and foliages for domestic market are done in bicycles, motor bikes, car and buses. These are all done in an ambient condition and therefore transporting flowers in summer is a challenge. The EOU unit however has refrigerated truck that transport export bound cut flowers from the farm to the airport.

##### **• Postharvest losses:**

The postharvest losses of cut flowers in Nepal are about 20-25%. The loss is highest at the wholesale where the cut flowers are sent after harvesting and grading from the grower. In general, the loss of cut flowers at the grower's level ranges up to 10% whereas the loss at the wholesale ranges from 12-16% across different cut flowers. The loss of cut flowers is highest in Gerbera and least being in Carnation.

##### **• Vase life extension measures**

In a survey in 2007, about 15% growers were found to use some form of food supplement or anti microbial agent although about 90% of the growers know the benefit of these food/chemicals. The primary reason for not applying these food/chemicals is because these products are for domestic market and the growers are not getting additional monetary benefit for the additional cost incurred by them. A local company in 2005 launched a small 5g packet of food supplement/chemicals for mixed floral bouquet (this supplement extended vase life by 75-100%) and got good response from the consumers. However, this could not go commercial because of the lack of support from the florist. Florist felt threatened by this product because they thought this product could reduce their current sales by 50% not realizing that extending



vase life could encourage more people to buy cut flowers. Recently, another company has introduced such food supplement of Floralife but it still is not very popular.

- **Value addition**

Value addition of cut flowers/foiliages in Nepal is primarily done by florist. The current addition of values by florist/retailers could range from 1: 2.0 to 1: 2.5. The range is influenced by season and demand/supply. The range is higher especially in winter when the demand is high due to marriage ceremonies and the supply of cut flowers within the country fails to meet the demand.

### III Marketing

#### a. Domestic Vs Export (shares)

The total market of floriculture products and services has been estimated to be Rs. 230 million in 2006 (US \$ 1=Rs.70) as shown in Table 4. The major share is of the domestic market (Rs. 230million-Rs. 20million (export data) = Rs. 210million). The export market when adjusted from this data is Rs. 20 million. Thus, the domestic market share is 90.48% in comparison to 9.52% of export market in 2006. During this time export of cut flowers was yet to begin and the major export items were bulbs, tubers, tuberous roots, corms etc.

Table 4: Total Volume of Floriculture Transactions in Nepal

SN	Description	Rs. Million	Remarks
1.	Seasonal flowers and plants	25	
2.	Ornamental plants	100	
3.	Shrubs and climbers	20	
4.	Cut flowers	25	FAN wholesale Rs.5.2
5.	Exports and domestic trade of Bulbs, rhizomes, etc.	20	
6.	Tissue culture and others	20	
7.	Landscaping and gardening	20	
	Total	230	

Source: FAN Estimation 2006

#### b. Main markets (local/exports)

The main market of cut flowers/foiliages in Nepal is Kathmandu. In the past few years, Pokhara market is expanding and recently efforts are being made by FAN to expand local market by reaching out to other major towns. In 2009, trial shipments of some cut flowers were tested at 10 major towns across the country and results have been found encouraging. Local market can be significantly increased these towns responses in the manner Pokhara has done.

#### c. Retail sales (florist shops/supermarkets/roadside vending)

Retail sales of cut flowers/ foliage and flower products have come a long way since it made its beginning in the early nineties. In Kathmandu, there were hardly 2-3 florist shops in 1994 and today there are about 54 in 2007-08. The florist shop is the major sales center for cut flowers at the retail level. In a survey in 2007, supermarket was found to be the most desired place for buying cut flowers but no supermarket has yet ventured to keep cut flowers/foliages in their shelves. Roadside vending of cut flowers/foliages is very rare but this is pretty common for potted ornamental plants and flowering seasonals.

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