RESEARCH DESIGN

“A STUDY OF RESOURCE MANAGEMENT & MARKETING STRATEGIES WITH PARTICULAR REFERENCE TO FLORICULTURE INDUSTRY IN KARNATAKA (BANGALORE URBAN & RURAL DISTRICT)”

The cultivation and export of floricultural products have received considerable interest in recent years from the policy makers, researchers, agricultural and horticultural planners. It is often argued that horticulture and allied activities have to be given importance in view of the sector’s potential in employment, income and export generation. Recognising this factor, Governments have given priority to horticulture by providing additional thrust to this area in recent years. The plan outlays have been stepped up in successive plans for development of horticulture as also floriculture. However, it needs to be noted that some states are lagging behind primarily due to lack of infrastructural facilities, lack of guidance to farmers by the department of horticulture as well as agro-climatic conditions.

An important emerging activity in horticultural sector is floriculture. This sub-sector has been encouraged, because of its demand both in domestic as well as international markets. The increases in per capita income and urbanisation have led to a greater preference and increased demand for flowers. At present, flowers are being extensively used in various places the testimony of this being,
mushrooming growth of florist centres in urban areas, its prosperity and demand. Yet, this sector has a few bottlenecks. These have to be tackled and consequently the activity should become more remunerative to the farmers.

**DEFINITION OF THE TERM FLORICULTURE**

Floriculture or flower farming, is a discipline of horticulture concerned with the cultivation of flowering and ornamental plants for gardens and for floristry, comprising the floral industry. As per International Trade Classification, floricultural products encompass the following:

a. **Bulbs, Tubers and Tuberous Roots.** These are products that may be planted in pots, boxes or similar containers.

b. **Live Plants.** These are plants that are used for permanent or semi-permanent decoration in offices, homes and buildings. These are whole plants which are suitable for planting or for ornamental purposes. Ornamental plants include flower bulbs, corms and tubers in the dormant as well as growth and blossoming stage and other live plants such as young vegetable plants and mushrooms’ spawn which cannot always be separated from ornamental plants.

c. **Cut Flowers.** These refer to flowers and flower buds with a suitable stem of varying length, which makes them suitable for bouquets or for ornamental purposes. Cut flowers generally mean all cut plant components the economic value of which lies in the decorative effects of their blossoms. Examples of
cut-flowers are roses, carnations, chrysanthemums, orchids, gladioli and many other types.

d. **Cut Foliage.** This refers to plant parts i.e., leaves, twigs, grasses, shoots etc., the economic value of which lies not in the decorative effect of the blossoms but in its colour and shape. Fresh cut foliage is used in combination with cut flowers for bouquets, flower arrangements and decorations when cut flowers and foliage are presented together in pre-arranged bunches. Fresh foliage is recorded in trade statistics as a secondary product and the bunch is classified as cut flowers.

Floricultural products also include dried flowers and foliage, propagating materials such as seeds, cuttings, bulbs etc., tissue cultured plants and starter and adult ornamental plants including house plants

**KARNATAKA AS A PRODUCER OF FLORICULTURE PRODUCTS**

Karnataka has been in the floriculture industry and business for over 300 years. Karnataka is the leader in floriculture, accounting for 75% of India’s total flower production. There are 18,000 hectares under floriculture cultivation. The state has the highest area under modern cut flowers, and 40 flower growing and exporting units. It is observed that the Tigala community near Devanahalli and Chickaballapur are extremely good at growing flowers. The high-value crops grown in green houses are cultivated under controlled conditions, protected from
pests, diseases, wind and humidity. Popular flowers used in the modern floriculture that are in demand are roses, anthurium, gerbera, gladioli, orchids, carnations and bird of paradise grown in poly houses. It is interesting to note that the country’s first and only flower auction centre is located in Karnataka. In 2003 The International Flower Auction Bangalore (IFAB), the operating company controlled by growers, has taken over the operations of the flower auction centre run by the State-owned Karnataka Agro Industries Corporation (KAIC)

**PRODUCTION OF FLORICULTURE:**

The production of floriculture has seen a significant progress over the years. As at 2011-12, the area under floriculture production in India was 253.65 thousand hectares with a production of 1.652 million tonnes loose flowers and 750.66 million tonnes cut flowers. Floriculture is now commercially cultivated in several states with Andhra Pradesh (24%), Tamil Nadu (20%) Karnataka (13%), having gone ahead of other producing states like Madhya Pradesh, Gujarat, Maharashtra, Punjab, Haryana, West Bengal, Orissa, Jharkhand, Uttar Pradesh and Chhattisgarh. About 232.74 thousand hectares area was under Cultivation in floriculture in 2012-13. Production of flowers are estimated at 1.729 million tonnes loose flowers and 76.73 million tonnes cut flowers in 2012-13. India's total export of floriculture was Rs. 423.43 crores in 2012-13. The country has exported
22,485.21 million tonnes of floriculture products to the world for the worth of Rs. 455.90 crores in 2013-14.

Major Export Destinations (2013-14): United States, Netherlands, Germany, United Kingdom, United Arab Emirates, Japan and Canada were major importing countries of Indian floriculture during the same period. The major importing countries were USA, Netherlands, Germany, United Kingdom, Japan, Canada and Japan. There are more than 300 export-oriented units in India. More than 50% of the floriculture units are based in Karnataka, Andhra Pradesh and Tamil Nadu. However, the growth within the state has not been uniform across the districts. Some districts and regions have been dominating in the coverage of area, production and productivity and some have lagged behind in the cultivation of flowers.

STATEMENT OF THE PROBLEM

Though floriculture is flourishing both in India as well as in the State, it has not made any remarkable breakthrough in the domestic and international floriculture markets due to various constraints. The country’s share in the world trade of fresh flowers is less than 1% per cent as compared to Netherlands 65 per cent, Columbia 12 per cent, Italy 6 per cent, Israel 4 per cent, Kenya 1 per cent and other countries 20 per cent. The area under floriculture although high compared to many countries, the area under protected cultivation is low compared
to these countries. The proportion of area under protected to total area floricultural area is 99 per cent in Colombia, 70 per cent in Netherlands and 57.51 per cent in Italy, where as in India it is 0.56 per cent. The investments in this sector and per capita consumption of flowers are also considerably low when compared to other developed countries like Western Europe, Japan and USA. In other words, the vast potential in the country does not seem to be fully tapped.

**FLORICULTURE EXPORTS:**

Export of floriculture from India was worth Rs 365 crore during 2011-12, a growth of 23.3 per cent over the previous year. About 232.74 thousand hectares area was under Cultivation in floriculture in 2012-13. Production of flowers are estimated to be 1.729 million tonnes loose flowers and 76.73 million tonnes cut flowers in 2012-13. India's total export of floriculture was Rs. 423.43 crores in 2012-13. The country has exported 22,485.21 MT of floriculture products to the world for the worth of Rs. 455.90 crores in 2013-14.

Karnataka, Tamil Nadu and Andhra Pradesh are the leading flower producing states in the country. Uttarakhand and Mizoram are emerging as new centres for cut flowers. Some exporters from Tamil Nadu are engaged in the export of dried flowers from Tuticorin and account for Rs 60-80 crore worth exports annually. During Valentine's Day this year, exporters witnessed higher orders from Europe, Australia, New Zealand and the Gulf countries. Christmas and Mother's
Day were other occasions that fuelled demand for flowers from the country. Exporters from Bangalore alone exported four million cut flower stems worth Rs 6 crore for this year's Valentine's Day, about 10 per cent more than last year.33

<table>
<thead>
<tr>
<th>YEAR</th>
<th>VALUE (IN CRORES)</th>
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<tr>
<td>2009 – 2010</td>
<td>294.46</td>
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<td>2010 – 2011</td>
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<tr>
<td>2011 – 2012</td>
<td>365.32</td>
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<tr>
<td>2012-2013</td>
<td>423.43</td>
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<td>2013 – 2014</td>
<td>455.90</td>
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Source; APEDA

India accounts for less than one per cent of the global floriculture trade, which is dominated by Kenya, Ethiopia, Ecuador and Colombia. Regions around Bangalore and Pune are the major production centres for cut flowers like roses and carnations. India's flowers are in great demand from traditional markets, such as Europe, Australia, West Asia and Japan. Besides, some exporters like Indo Blooms Ltd have tapped the Japanese market. However, the producers' problems are compounded by the shortage of labour and high transportation costs. It was observed by experts that India's exports would have been much higher during the

33South India Floriculture Association
fiscal year 2012-2013, if the government had approved air freight subsidy in time as many exporters could not fulfil orders due to the absence of subsidy.

As far as domestic floriculture is concerned, it is constrained by lack of awareness about its potential, lack of quality planting material, weak infrastructural support, lack of post- harvest facilities, lack of good markets, exploitation by middlemen, weak database, and absence of information on income generation and employment generation from different flower cultivation and export barriers. It is also viewed that a majority of the flower growers belong to small and marginal farmers’ category, facing many problems. No comprehensive study has been undertaken to cover all these aspects in the state. Therefore, an attempt has been made to highlight these issues in addition to providing database for identifying the magnitude of problems and prospects of this sector and also suggesting appropriate measures for tackling the problems of the growers and improving the floricultural industry and contributes to build primary literature in the field.

**OBJECTIVES**

Keeping the above issues, the present study has examined the following broad objectives:

1. To study the scope of floriculture industry with particular reference to Karnataka (Bangalore rural dist., Mysore, Mangalore)
2. To study the problems and prospects of floriculture industry in Karnataka

3. To study the resource management with particular reference to floriculture industry

4. To study the extent of marketing avenues in the global market

5. To offer suggestions and recommendations

**SCOPE OF THE STUDY**

The study looks into the problems and prospects of floriculture industry in Karnataka and the resource management practices in Karnataka. The study covers the state of Karnataka focussing on Bangalore rural dist. The study has focussed on floriculture industry related products with specific reference to contemporary cut flowers and cut foliage, Plant nursery, Traditional florist trade, Plant rental service, Flower perfumes etc.

**METHODOLOGY:-**

This descriptive study is exploratory in nature, and has used survey method to collect data necessary to ascertain the research objectives and validate the findings. The universe consisted of all individuals and organisations involved in floriculture industry in Karnataka. Since the size of the universe was large, sampling technique was adopted to identify the units and collect data. A total of 150 organisations and individuals constituting more than 5% of the universe were
found to be adequate for the purposes of the study. Secondary data was used to supplement the information obtained through primary data. Thus, the Data has been obtained through primary and secondary data sources. For the collection of data extensive travel was undertaken to cover the length and breadth of Karnataka for identifying the population under study and also to collect relevant data using the questionnaire as a tool and use of interview schedule to augment and supplement information needed for the study. The data gathered was assimilated through the process of compilation, classification and tabulation and analysis of data collected was completed applying statistical tools such trends, correlation and regression analysis to draw inferences and conclusions.

**HYPOTHESIS:**

The study has the following Hypothesis

1. Floriculture industry presents very good opportunity for exports
2. Floriculture industry offers good income earning potential
3. Floriculture industry generates good employment opportunity
4. Karnataka more so Bangalore has the most conducive atmosphere for cultivation of floriculture products
SAMPLING PLAN

The population consisted of all the individuals involved in the production, marketing, facilitating and distribution of floriculture products. Although in some ways one might consider the population as finite, due to constraints of resources and time, complete enumeration of the population by census method is not possible and therefore, stratified random sampling technique was used to select the sample units for the survey. A representative sample consisting of a total of 150 individuals and organisations accounting for more than 5% of the universe under each stratification were found to be adequate for the purposes of the study. The sampling frame consisted of florists, traders, floriculturists and organisations belonging to south Indian floriculture association and EOU’s.

SOURCE OF DATA COLLECTION:-

The sources of data collection included both primary sources and secondary sources.

Primary data collection: Data for primary information was collected by administering a structured questionnaire designed for the purpose. The questionnaire included both open and close-ended questions. Primary data was also obtained with the help of personal interviews carried on with the respondents selected for the survey.
Secondary data collection: Secondary data was collected from books, internet, literature and other relevant documents. Magazines, Journals, Fact sheets and Web resources such online libraries and websites.

TOOLS AND TECHNIQUES FOR DATA COLLECTION

Data has been gathered using questionnaire as a tool. The questionnaire was a structured one used after due validation and included both open ended and close ended questions. Questionnaire was used as a base for collecting data through interviews with some of the respondents especially those at the higher levels of management.

PLAN OF ANALYSIS

The data gathered has under gone the process of compilation, classification and tabulation and analysis of data collected has been done applying statistical tools to draw inferences and conclusions. The analysed data has been presented in the form of a report. Graphs and diagrams have been use to present the data wherever required.
LIMITATIONS

The study concentrates on floriculture industry its resource management and marketing strategies and covers only limited set of florists, traders and EOU’s. The analysis has been done based on the information provided by these respondents and is based on the assumption that the respondents divulge the correct information. Although due consideration has been given to remove bias, the study may reflect certain inherent bias. This study is conducted as an academic interest and suffers from time and cost constraints.

CHAPTER SCHEME

The study has adopted the following chapter scheme to present the research findings

CHAPTER 1- INTRODUCTION

This chapter deals with introduction of the subject and includes introduction to floriculture industry in India and issues concerning the products, processes and marketing of the products and services in floriculture industry
CHAPTER 2 – RESEARCH DESIGN:

This chapter deals with design of the research process adopted by the study and includes the rationale for the study i.e. statement of the problem, scope of the study, objectives of the study, methodology, sampling plan, tools and techniques for collection of data, plan of analysis, limitations and chapter scheme. This chapter also covers the literature survey carried out and identifies the research gap that this study proposes to cover and contribute.

CHAPTER 3- PROFILE OF RESPONDENT GROUPS:

This chapter deals with profile of respondents and covers the profile of the respondent group covered by the study company.

CHAPTER 4- INDUSTRY PROFILE:

This chapter covers the problems and prospects of floriculture industry in Karnataka.
CHAPTER 5 ANALYSIS & INTERPRETATIONS:

It deals with analysis of the data collected and interpretation of the same. This chapter also covers the exploration of business opportunities for floriculture industry in Karnataka

CHAPTER 6- SUMMARY & FINDINGS:

It deals with the findings from the analysis made and also the suggestions.
As a backdrop to the study, published literature on various aspects of floriculture both, national and international are reviewed and presented in a comprehensive capsule. The review is presented to bring out and highlight the fact that the present study is unique and has relevance in the context of emerging trends in floriculture industry and business.

Challenges for the floriculture industry in a developing country: a SouthAfrican perspective34 by Matthee, Marianne Naudé, Wim Viviers, and Wilma published in Development Southern Africa; Oct 2006, Issue 4, outlines the increasing numbers of global floriculture producers, and changes in the basis of competition in this international industry, and suggests that it is important to evaluate the South African floriculture industry's competitive position. They highlight that the South African floriculture industry employs more than 17,500 people and provides opportunities for rural employment. This paper assesses the challenges facing the South African floriculture industry in the competitive global market, using a framework based on global value chain and global commodity chain analyses. The results of the empirical study showed that the industry is

34Matthee, Marianne Naudé, Wim Viviers, and Wilma, Challenges for the floriculture industry in a developing country: a SouthAfrican perspective published in Development Southern Africa; Oct 2006, Issue 4
insufficiently competitive and does not participate to its full potential in the global market. The study recommended that floriculture producers shift their focus from the domestic to the international market, as the domestic market is becoming saturated and its turnover is small. However, as enhancing the industry's competitiveness is a complex endeavor, the industry first needs to address the weaknesses identified.

**Fresh Cut Flowers and Exploitation**

by Miller, Christina M. published in *Perspectives on Global Development & Technology; 2012, Issue 1*: The paper outlines the technological invasion into the lives from food to clothes to cars and everything in between. These forces are significant factors in the daily lives of people all over the world. The availability of fresh cut flowers in the United States, Canada, and Europe is intimately tied to exploitation of workers in the third world. In this paper a look at two case studies on different hemispheres, Colombia and Kenya were taken to outline the level and extent of the exploitation of workers, especially women and children in the process of production and export of cut flowers.

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Miller, Christina M., *Fresh Cut Flowers and Exploitation* published in *Perspectives on Global Development & Technology; 2012, Issue 1*.
Sustainability and Certification in Horticulture by Snyder and Jim published in Greenhouse Product News; Jul2011, Vol. 21 Issue 7. The paper discusses the sustainable initiatives in floriculture and certifications in Great Britain. It indicates that sustainability claims of floriculture business is being validated by the certifications. It describes several sustainability certifications including the MPS which lessens the environmental impact of floriculture, the VeriFlora which is intended for all ornamental plants and the Good Agricultural Practices (GAP)/Global GAP which applies to agricultural products manufacturers.

Development of Chinese Flower Auction Markets: Results from a Comparative Analysis by Kaida Qin, Xiaoli Jiang Yang and Baojian published in I-Business; Dec2010, Vol. 2 Issue 4. For the vast majority of floriculture business, the auction is the best way to realize an assortment of flowers with as broad a scope as possible, produced across the world, and available for market price. Flora Holland is the largest and successful flower auction market in the world and approximately 44 million cut flowers and 4.8 million houseplants and garden plants are traded daily. But the operation of Chinese flower auction markets is not so successful that some researchers have concluded that the auction method doesn't suit to Chinese practice. This paper compares operational goals and

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36 Snyder, Jim, Sustainability and Certification in Horticulture, published in Greenhouse Product News; Jul2011, Vol. 21 Issue 7
37 Kaida Qin, Xiaoli Jiang Yang, Baojian, Development of Chinese Flower Auction Markets: Results from a Comparative Analysis published in I-Business; Dec2010, Vol. 2 Issue 4
performances of Flora Holland with Kunming, International Flower Auction Market (KIFA), which are two typical flower auction markets in the two countries. Finally, the paper gives five crucial advices for developing Chinese flower auction markets: transit of service strategies, cultivation of participants' network, establishing standardization, clever mechanism design and avoiding some factors impairing successful auction, and improving on operational performance continuously. Auction method will have a bright perspective in Chinese flowers trade in the future.

From Revolutionary Peasants To Leaders Of Export Revolution: A Saga Of 1990's


Floriculture as a sunrise industry has still not been the fancy of business researchers but as a sector which often marks an entrepreneurial shift directly from the primary sector to high end export, shift in market networking from human interface to global information technology networking and from localized sale and purchase to dependence on complex international logistics, it offers potential for studies in strategic change in a host of economic and management areas. Based on in-depth interviews with floriculturists, bankers, scientists, officials of the Government of Uttar Pradesh, wholesalers and retailers of the flower markets, the

paper examines some key elements that mark the transformation from traditional agriculture to export oriented floriculture in and around Lucknow. The paper discusses the basic supply chain models in different kinds of floriculture and the bottlenecks in the rise to the level of exports.

Evolution of Modern Rose Production\textsuperscript{39} by DeVor and Bill, published in American Nurseryman; May 2010, Vol. 210 Issue 5. The paper outlines the evolution of rose breeds in Greenheart Farms Inc., an Arroyo Grande, California-based farm. It mentions the modern evolution of the floral potted rose from 1970 down to 1980. It also notes the modern evolution of the garden rose from 1990 with a new variety that has been introduced, the Knock Out shrub rose.

Male and Female Flower Trading Farms in West Bengal\textsuperscript{40} by Chakrabarti, Sanjukta Sarker and Debnarayan published in India Economy Review Jan 2011, Vol. 7. This paper describes and reviews the domestic flower trading market of West Bengal, the third largest flower producer in India. The important role that floriculture plays in the Indian economy by augmenting rural employment as well as the empowering backward women and earning foreign exchange is noted. The findings of the study show that rural markets are more efficient than urban markets in flower crops and female marketing agent are more

\textsuperscript{39}DeVor, Bill, Evolution of Modern Rose Production published in American Nurseryman; May 2010, Vol. 210 Issue 5
\textsuperscript{40}Chakrabarti, Sanjukta Sarker and Debnarayan, Male and Female Flower Trading Farms in West Bengal, published in India Economy Review Jan 2011, Vol. 7
efficient than their male counterparts but the overall flower market is very unorganized.

**Made for Shade** by McDonald and Ellen published in *American Nurseryman*; 2/1/2005, Vol. 201 Issue 3. The paper presents information on shading systems designed for providing shade to plants in greenhouses. Shade cloths and structures have long allowed growers to cover areas from a single bench of plants to an entire acre. Fire-retardant materials for shades are available, and reflective materials appear to be gaining popularity. While retailers may make customer comfort a priority, some growers might say plant comfort outweighs people comfort any day of the week.

**Watering Bedding Plants before Shipping** by Runkle, Erik Craig, Daedre published in *Greenhouse Product News*; Aug 2011, Vol. 21 Issue 8. The paper focuses on a study which explores the influence of watering practices on plant longevity, as well as watering variability within racks, carts and among growers. The study involved 606 flats of petunia from the loading dock of Kalamazoo Flower Group (KFG). It suggests that plants remained marketable
despite variability of plant moisture among growers. Moreover, it indicates the importance of proper watering of plants after they arrive at their retail destination.

Measuring Demand Factors Influencing Market Penetration and Buying Frequency for Flowers in the U.S. by Marco A Palma and Ronald W Ward published in the International Food & Agribusiness Management Review; 2010, Vol. 13 Issue 1, p65-81, 17p looks at the floriculture industry which faces many challenges including increasing energy and input prices, seasonality of its products and international competition. To analyze floriculture demand, the study estimates and uses simulation analysis to decompose it into market penetration and buying frequency. The study emphasizes that an understanding what are the factors that influence non-buyers of floral products to become buyers, and the factors that influence current buyers to increase their expenditures on floral products is vital information that the industry can use to design specific programs targeting different demographic groups according to their specific preferences for flowers.


The use of hand tools that fit users’ characteristics is essential for task productivity and prevention of musculoskeletal disorders in industry. In Colombia, workers in the floriculture industry use a wide range of hand tools in cultivation tasks. However, little is known about the correspondence between the employed tools and hand dimensions of this population. This paper studies the hand anthropometry (HA) of a sample of 120 adult female workers of the Colombian flower industry located in the Bogota plateau. In total thirty-three HA measures were studied. A survey of the tasks and hand tools used in this population was also conducted. Detailed descriptive statistics were estimated for the assessed HA measures; and a comparative statistical analysis with other worker female populations reported in the literature was conducted. We found that the surveyed floriculture workers are systematically using tools with dimensions that do not adequately fit their HA and that may impose unnecessary mechanical loads to the users. HA in the present study population appear to be significantly different from other populations’ HA, which suggest the need to promote the acquisition, design or re-design of manual tools specifically thought for this working population.
population. Relevance to industry: Hand anthropometry is a necessary input for
tool design that promotes task productivity and workers’ health. The detailed HA
information presented in this study can be used by tool manufacturers to design
tools that are suitable for workers of the Colombian floriculture industry.

“Pulling flowers from the sky”\textsuperscript{45} by Seideman and Tony published in
Journal of Commerce (15307557); 6/7/2004, Vol. 5 Issue 23, Discusses the
benefits of advanced refrigeration technology to container lines and shippers in the
flower trade. The article ‘highlights the wholesale value of the global flower
market in 2000 and uses case studies to demonstrate the benefits of Advanced
Fresh Air Management systems and presents the countries which compete in the
floral production marketplace.

Importing change: Canadian competition and the
U.S. Floriculture industry\textsuperscript{46} by Reid, Neil Smith, Bruce W.Gatrell, Jay
D.Carroll, Michael C, published in Industrial Geographer; Spring2009, Vol. 6
Issue 1, During the last century American agriculture has undergone a massive
transformation from an industry dominated by a large number of small family-
owned farms to an industry characterized by a fewer larger scale, heavily-

\textsuperscript{45}Seideman, Tony, “Pulling flowers from the sky”, published in Journal of Commerce (15307557); 6/7/2004, Vol. 5
Issue 23

\textsuperscript{46}Reid, Neil Smith, Bruce W.Gatrell, Jay D.Carroll, Michael C, Importing change: Canadian competition and the
U.S. Floriculture industry, published in Industrial Geographer; Spring2009, Vol. 6 Issue 1,
capitalized enterprises. In this paper, we analyze the shifting geography of production with respect to the U.S. floriculture industry. The ongoing transformation of the floriculture industry is being driven by two interrelated phenomena. One is growing Canadian imports, particularly from Ontario. Canadian producers benefit from a fortuitous location with respect to major American markets, operate on a larger scale, enjoy a more favorable institutional setting, and until recently, profited from a favorable exchange rate. Another transformative process has been increasing sales of floricultural products by mass merchandisers in the U.S. The "big box" stores favor large scale operations, including Canadian exporters, due to larger scale demand and more complex sales agreements. As a result of these transformative changes, the U.S. floriculture industry will likely move to a dual market structure, consisting of large scale producers, who can supply the "big boxes" and compete effectively with foreign imports, and another segment of small scale producers who will have to carve out local markets based on higher quality customer service and/or being responsive to specialized consumer demands.

Keeping the Bloom on the Floral and Nursery Industry by Comis, and Don published in Agricultural Research; Dec2000, Vol. 48 Issue 12, Examines how the floral and nursery industry has grown in the United States as of
December 2000 and outlines the Market value of the industry, Importance of the industry in rural and urban communities, Significance of the research programs on floriculture and nursery and how the industry helps the environment.

**Export development in difficult places: achieving and sustaining global competitiveness**\(^{48}\) by malter, alan j. Jaffee and steven published in ama winter educators' conference proceedings; 2003, This paper examines the role of industry dusters in the improbable development and survival over time of globally competitive floriculture exports from Southern Africa. We focus on how social ties within an industry cluster have enabled firms to acquire vital production know-how and market information, then continue exporting despite a hostile political environment, collapsing local economy, and reduced demand in key overseas markets. We report findings from a field study and mail survey of cluster members. This case tests the boundaries of cluster theory in the extreme conditions of a less developed region.

**New pension plan for Dutch flower industry**\(^{49}\) by Payne and Beatrix published in the Pensions & Investments; 2006, Vol. 34 Issue 8, The paper provides details of the pension plan for Dutch flower industry. Dutch flower

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\(^{48}\) malter, alan j. Jaffee and steven, Export development in difficult places: achieving and sustaining global competitiveness, published in AMA winter educators' conference proceedings; 2003

\(^{49}\) Payne and Beatrix, New plan for Dutch flower industry, published in Pensions & Investments, 2006, Vol. 34 Issue 8,
wholesalers and delivery personnel will have their own pension plan, one of the Netherlands' first industry wide defined contribution plan starting in 2007. The plan will cover around 20,000 employees ranging from wholesale flower buyers to truck drivers and will likely have contributions of up to euro 5 million ($6 million) to euro 7 million annually.

Flower exports reduce poverty in China by Shi Tianjun published in International Trade Financing Forum; 2004, Issue 1, The paper comments on the International Trade Centre project that helped the flower growers in Yunnan Province, China improve their skills. Overall production and quality have increased considerably. When the project started in 1999, the export value of cut flowers amounted to little over US $5 million. Their export value reached some US $18 million in 2002, the target originally set for 2010, and it is estimated that the value will exceed US$ 20 million this year. In the meantime, the incomes of flower enterprises and household growers are increasingly stable.

The credentialed florist by Moore and Sallyann Robert published in Florist; Feb97, Vol. 30 Issue 9, Presents a comprehensive guide to credential

50Shi Tianjun, Flower exports reduce poverty in China, published in International Trade Financing Forum; 2004, Issue 1
51Moore and Sallyann Robert, The credentialed florist, published in Florist; Feb97, Vol. 30 Issue 9,
programs in the floral industry in the United States. Benefits of credentials for florists; Profile of associations of florists and floriculturists with credential


**Uganda's Flower Farms and Private Sector Development** by Langan and Mark published in *Development & Change; Sep 2011, Issue 5*, The European Union's (EU) pledge to assist private sector development (PSD) in the African, Caribbean, and Pacific (ACP) states is a key pillar of its bilateral trade relationship with former colonies. It is this ostensible support to PSD that allows the EU to contend that its pursuit of market opening in ACP countries under Economic Partnership Agreements (EPAs) is not detrimental to human well-being in low-income countries, in spite of risks of import flooding and EU monopolization of emerging sectors. This paper explores the legitimizing 'development' rationales of EU PSD frameworks from the perspective of

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53 Langan and Mark, *Uganda's Flower Farms and Private Sector Development*, published in *Development & Change; Sep 2011, Issue 5*
stakeholders in a strategic site of private sector activity in the ACP grouping. Specifically, it explores Europe's PSD agendas from the standpoint of investors, managers and workers in Uganda's cut-flower sector, which is domestically seen as one of the sectors most likely to bring economic benefits to Uganda. Based on interviews with stakeholders in the industry, the paper explores whether actors in this business sector concur with the underlying 'pro-poor' rationales of Europe's PSD framework and whether Europe is seen as a meaningful partner in this prioritized site of private sector activity.

FLOWER POWER\textsuperscript{54} by Stewart and Amy by published in Foreign Policy; July/Aug2007, Issue 161, This paper examines the changes in the global flower market due to biotechnology breakthroughs, new competitors and customers who expect perfect blooms every time, year round. The worldwide distribution of flowers is discussed and the effect it has had on creating a $40 billion industry. Details of how fresh flowers make it around the world for resale are presented.

FLOWER POWER\textsuperscript{55} by Jenish, D'arcy published in Maclean's; 04/302001, Vol. 114 Issue 18. Outlines the Canadian flower industry. Popularity of

\textsuperscript{54}Stewart and Amy, FLOWER POWER, published in Foreign Policy; July/Aug2007, Issue 161
\textsuperscript{55}Jenish, D'arcy. FLOWER POWER, published in Maclean's; 04/302001, Vol. 114 Issue 18.
gardening as a leisure activity in Canada; Mention of several flower varieties which are popular with Canadian gardeners; Efforts of growers to increase output; Impact of high energy costs on greenhouse operators.

Breeding Brilliance\textsuperscript{56} by Freyre, Rosanna Clark, Dave Deng, ZhanaoHarbaugh, Brent Henny and Jake published in Greenhouse Product News; Jun 2009, Vol. 19 Issue 6. The paper presents information on the University of Florida, Gainesville, Florida's floriculture breeding program. The program focuses on foliage, lisianthus, gerbera, caladium, coleus, other bedding plants, and tropical flowering and foliage landscape plants. Over the years, a number of cultivars with improved disease resistance and/or stress tolerance have been released through this program.

Effective pest control for indoor citrus nursery production\textsuperscript{57} by Blake, Cary published in Western Farm Press; 9/3/2011, Vol. 33 Issue 20. The paper focuses on the efforts of California and Arizona citrus nursery growers to gain protection from the Asian citrus psyllid (ACP) insect and Huanlongbing (HLB) by modifying production of critical plants from the outdoors to indoor protective scheme. According to Jim Bethke, University of California Cooperative


Extension floriculture farm advisor in San Diego County, several time and efforts are made to search for pests and positively determining it.

Floriculture: An industry in flux by Barrett, Jim published in Greenhouse Product News; Jul97, Vol. 7 Issue 7, provides an overview on how every segment of the floriculture industry is changing and how growers and retailers are dealing with that change. Reaction of growers to the increasing competitions for sales to the chain stores; Evolution of the big business versus little business; Evolution of the brokers; A glimpse at the continuation of downward trend in floriculture industry.

Exploring the dilemma of local sourcing versus international development – the case of the flower industry by Holt, Diane Watson, Anna published in Business Strategy & the Environment (John Wiley & Sons, Inc); Jul2008, Vol. 17 Issue 5. This paper examines the debate surrounding local versus international sourcing of retail products, particularly food and flowers, in light of the emerging carbon imperative. The paper begins by examining the Fairtrade market and then examines ‘food miles’ and carbon impact. The complexity of sourcing decisions when considering both international development issues and

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58 Floriculture: An industry in flux by Barrett, Jim published in GPN: Greenhouse Product News; Jul97, Vol. 7 Issue 7
the emerging carbon agenda is considered using the case of the cut flower industry.

**Plant biotechnology effect in floriculture** by Clark, David G. published in GPN: Greenhouse Product News; Oct96, Vol. 6 Issue 10. Outlines the positive effects that advances in plant molecular biology and genetic engineering have on the floriculture industry and the objectives of the floriculture industry. The paper also provides information on a number of technologies being used in plant molecular biology and genetic engineering and information on a number of gene experiments carried out by researchers on floriculture.

**Floriculture Group at North Carolina State University** by Whipker, Brian published in Greenhouse Product News; Jan2011, Vol. 21 Issue 1. The paper provides information on several floriculture group from various departments, including horticulture, plant pathology and entomology at North Carolina State University in Raleigh, North Carolina. It mentions that North Carolina State University is the only university recognized for research program on greenhouse and field cut, flowers in the U.S.

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60 Clark, David G., Plant biotechnology effect in floriculture, published in GPN: Greenhouse Product News; Oct96, Vol. 6 Issue 10
61 Whipker, Brian, Floriculture Group at North Carolina State University, published in Greenhouse Product News; Jan2011, Vol. 21 Issue 1
LEDs in Floriculture\textsuperscript{62} by Runkle published in Greenhouse Product News; Jun 2009, Vol. 19 Issue 6. The paper presents a summary of information on the use of light-emitting diodes (LED) in floriculture. In horticulture, LEDs were first used for plant-growth studies in the mid-1980s on the space shuttle and in space stations. According to a report, LEDs consumed about one-third the amount of energy as high-pressure sodium (HPS) and metal halide lamps that produced the same light intensity.

Nip Crisis in the Bud\textsuperscript{63} by Gieben, Mark published in IESE Insight; First Quarter 2012, Issue 12. The paper discusses the importance of investing in multichannel sales strategies for the floriculture industry to survive and eventually thrive in Kenya. It identifies that flower growers need to develop scenarios for dealing with demand and supply fluctuations. It implores that Kenya should also leverage existing relationship with Tesco PLC to expand flower sales to subsidiaries in various countries.

\textsuperscript{62}Runkle, LEDs in Floriculture published in Greenhouse Product News; Jun 2009, Vol. 19 Issue 6
\textsuperscript{63}Gieben, Mark, Nip Crisis in the Bud, published in IESE Insight; First Quarter 2012, Issue 12.
The Industry's Bright Future\textsuperscript{64} by Hodson, Tim published in Greenhouse Product News; Aug2011, Vol. 21 Issue 8. The paper outlines the advancements in the greenhouse product industry as of August 2011 such as research works on breeding traits of azaleas, as well as on harmful effects that may occur in floriculture crops when passing from the grower to the consumer.

Cut Flowers: A Potential Pesticide Hazard\textsuperscript{65} by Morse, DasleL.Baker, Edward L.Landrigan, Philip J. published in American Journal of Public Health; Jan1979, Vol. 69 Issue 1. Based on the reports of ten cases of possible organophosphate pesticide poisoning in florists exposed to pesticide residues on cut flowers, the authors conducted a prospective random-sample survey to determine residual pesticide levels on flowers imported into the United States via Miami, Florida. A sample of all flowers imported into Miami on three days in January 1977 showed that 18 (17.7 per cent) of 105 lots contained pesticide residue levels >5 ppm, and that three lots had levels >400 ppm. Azodrin (monocrotophos) was the most important contaminant with levels of 7.7 4,750 ppm detected in nine lots. The study also examined 20 quarantine workers in Miami and 12 commercial florists exposed to

\textsuperscript{64}Hodson, Tim, The Industry's Bright Future published in Greenhouse Product News; Aug2011, Vol. 21 Issue 8.
contaminated flowers. Occasional nonspecific symptoms compatible with possible organophosphate exposure were noted, but the study found no abnormalities in plasma or red blood cell cholinesterase levels. This study documents a previously unrecognized potential source of occupational pesticide exposure and suggests that safety standards should be set for residue levels on cut flowers.

**Using suitable packaging for exports of floricultural products**\(^6^6\) by Herard, Pierre Robson, Neil published in *International Trade Forum; Oct-Dec92, Issue 4*. Highlights the existing methods of packing floriculture products, types of stresses that the package is exposed to and the materials appropriate for export packaging. The paper outlines the most suitable methods of packaging floricultural products for export as well as the export packaging that correctly adapts to the product.

**Fragile flowers - special care through supply chain**\(^6^7\) by Horibe, Kathlyn published in *Canadian Sailings;2005*. Focuses on the greenhouse floriculture industry in Canada. Growth of the floriculture industry till 2005, information on the strategies used by florists to grow and sell flowers, issues that are to be taken into consideration during shipping flowers.

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\(^6^6\)Herard, Pierre Robson, Neil, Using suitable packaging for exports of floricultural products, published in International Trade Forum; Oct-Dec92, Issue 2

\(^6^7\)Horibe, Kathlyn, Fragile flowers - special care through supply chain, published in Canadian Sailings;2005
Saturating Daily Light Integral (DLIs) for Flowering\textsuperscript{68} by Runkle, Erik published in Greenhouse Product News; Feb 2011, Vol. 21 Issue 2. The paper discusses impact of light exposure on greenhouse gardening of flowering plants. It describes that daily light integral (DLI) is the quantity of photosynthetic light received by plants during one day. It further states that several aspects of floriculture crops are influenced by DLI, including flowering time, flower quality, and branching. A chart is presented that lists saturating DLI values for several plant varieties.

Made for Shade\textsuperscript{69} by McDonald, Ellen published in American Nurseryman; 2/1/2005, Vol. 201 Issue 3. The paper presents information on shading systems designed for providing shade to plants in greenhouses. Shade cloths and structures have long allowed growers to cover areas from a single bench of plants to an entire acre. The paper outlines the different materials used to provide shade for the flowering plants from fire-retardant materials for shades to reflective materials which have gained popularity to the extant that plant comfort outweighs people comfort.

\textsuperscript{68}Runkle, Erik, Saturating Daily Light Integral (DLIs) for Flowering, published in Greenhouse Product News; Feb 2011, Vol. 21 Issue 2.

\textsuperscript{69}McDonald, Ellen, Made for Shade, published in American Nurseryman; 2005, Vol. 201 Issue 3.
Saving the World's Flowers\textsuperscript{70} by Comis, Don published in Agricultural Research; Aug2004, Vol. 52 Issue 8. The paper provides information on the gene pool of flowering plants at the Ornamental Plant Germ plasm Center (OPGC) in Columbus, Ohio. The paper also provides the value of the floriculture industry in the U.S, the number of gene-banks maintained by OPGC across the country, importance of the preservation of flower germ-plasm and provides insight based on the details of a study on the effect of temperature and water availability during seed production on the quality of zinnia and marigold seeds.

Floriculture And Nursery Crop Sales\textsuperscript{71} by Bridson, Rebecca published in Grounds Maintenance; Mar2003, Vol. 38 Issue 3, reports on the U.S. Department of Agriculture's forecasted floriculture and nursery crop sales. Increase in nursery and floriculture crop sales; Regional grower sales.

Temperature measurements in Floriculture\textsuperscript{72} by Runkle, published in GPN: Greenhouse Product News; Mar2011, Vol. 21 Issue 3. The paper focuses on measuring and controlling air temperature for growing ornamental and food crops. It states that the use of greenhouses, is to provide desirable temperatures for plant growth and development. It also states that a thermocouple is the most

\textsuperscript{71} Bridson, Rebecca, Floriculture And Nursery Crop Sales, published in Grounds Maintenance; Mar2003, Vol. 38 Issue 3
\textsuperscript{72} Runkle, Temperature measurements in Floriculture, published in GPN: Greenhouse Product News; Mar2011, Vol. 21 Issue
common device used to measure air temperature. Further it states that the
temperature of the root zone can be measured by inserting a thermocouple into the
media.

Prospects of floriculture in India by Dr. N. K. Dadlani, published in
the Floriculture today, June 1996, has stressed on the prospects of floriculture
industry in India, throwing light on the status of this industry. He has also given
cogent reasons for the future growth prospects. In doing so, he has tried to
highlight the export potential of the main areas, i.e., cut flowers, flower seeds and
floral extracts. He strongly feels that there is good potential for export of all
floriculture products from all over the country. He also stresses on bringing out
high quality products keeping in mind the finicky nature of the foreign markets
and the cost economics involved. Dr. Dadlani opines that there is a lack of
infrastructure support from the government at the airports, though this is being
pursued by many floriculture associations. It would be quite appropriate to
mention at this point of time that the government has come up with good facilities
in Delhi, Pune, Bangalore, etc. Moreover, airport expansion and privatization of
management is around the corner. Being an expert and an adviser to the Ministry
of Agriculture, he has clearly identified the problems existing in this field, and the

73 Dr. N. K. Dadlani, Prospects of floriculture in India, publisher, Floriculture today, June 1996
pressing need of solutions to these disruptive problems which are hampering the progress of this sector.

Emerging opportunities in floriculture\textsuperscript{74} by Dr. J. A. Siddiqui published in the Floriculture today, June 1996 brought out the emerging opportunities in floriculture in their paper based on statistical data covering various aspects, including state wise cultivation area, section-wise exports of floriculture, India's exports of floriculture products to principal markets and the international scenario. It also gives measures for export promotion. The article states the future strategy which would develop this industry, viz., setting up model floriculture centers, flower exchange centers, improving infrastructure, reduction in import duty, export of floral waste, etc. It is evident that commercialization of floriculture i.e., networking between agriculturists, research institutions and the export/marketing organizations is an equally important aspect. With an appropriate mix of promotional steps on the part of the government and production of new and varied, international quality flowers, it is possible to develop this industry at a faster pace. This article also provides a wealth of statistics, especially with reference to export markets that India is concentrating on.

India’s Advantage\textsuperscript{75} by Dr. Foja Singh published in the Agriculture and Industry Survey April 1997 has projected the status of the Floriculture industry in the new millennium. The writer has categorically stated the role of

\textsuperscript{74} Dr. J. A. Siddiqui, Emerging opportunities in floriculture, published in the Floriculture today, June 1996
\textsuperscript{75} Singh Dr. Foja, India’s Advantage, published in the Agriculture and Industry Survey April 1997
India in floriculture and has briefly narrated the present status in terms of exports, the destinations and the area under cultivation. He goes on to add that there is development on all sectors i.e., from infrastructure to marketing as well cold storage at the airports. He has projected the future plans of this budding industry in which he emphasizes on the planting material, floriculture to be recognized as an industry in the process the land regulation laws to be removed, financial agencies should give a helping hand through a single window clearance, sales in domestic market especially through auction centers and flower markets, export markets should be more systematic and floriculture board should be set up. Dr. Foja Singh strongly feels that all the entrepreneurs and floriculturists should come together to form a Floriculture Board. This Board can take up the immediate needs of the industry at National and International level. He has also gives a graphical presentation on the percentage growth of Indian floriculture exports to major countries and its exports for the past few years. With the change in the millennium, let's hope that we have a flowering floriculture industry.

CONCLUSION

The review of literature has given the researcher an insight into various dimensions of the floriculture industry ranging from cultivation of flowers, growing of flowers to specific problems relating to cultivation, produce and prospects of floriculture. If the initiatives taken by state and central governments
in India are taken as a measure of importance given to the sector of floriculture, the Industry ranks as a great prospect for not only exports but also foreign exchange earner. Although there are studies covering the botanical aspects of floriculture, the literature clearly reflects, the lack of systematic study in the domain of marketing of the floriculture produce and existence of organized literature covering the supply chain and resource management domains of floriculture Industry clearly identifying the existence of a gap in literature towards marketing and resource management in floriculture Industry.