

PROSPECTS OF FLORICULTURE IN INDIA:A REVIEW ANALYSIS WITH SPECIAL REFERENCE TO ARID AND SEMI ARID REGIONS

ABHILASHA DEEPA MINZ¹ AND SHIBA SUPRIYA DEMTA²

¹Department of Agricultural Extension,

²Department of Horticulture, Agriculture College Garhwa, Birsa Agricultural University, Ranchi, India

(Received 24 February, 2023; Accepted 29 April, 2023)

Key words: Floriculture, Climate Change, Aridity, Nursery, Diversification.

Abstract– Over the years, horticulture has emerged as one of the potential agricultural enterprise in accelerating the growth of economy. Its role in the country's nutritional security, poverty alleviation and employment generation programmes is becoming increasingly important. It offers not only a wide range of options to the farmers for crop diversification, but also provides ample scope for sustaining large number of Agro- industries which generate huge employment opportunities. In terms of increasing farmers' income, diversification towards flower cultivation results in higher profit per unit area than most of the field crops and therefore can enhance the livelihood of farmers. Despite of the major constraints in flower production in India it can still be developed on a commercial scale even in adverse climatic conditions such as arid and semi arid regions. This gives plenty of opportunity to farmers to expand beyond the conventional venture of farming.

INTRODUCTION

Floriculture has become one of the most important commercial trade in agriculture. Commercial floriculture has emerged as hi-tech activity taking place under controlled climatic conditions inside greenhouse. At present the global ornamental crop industry is worth about US\$ 70 billion. The global consumption of flowers is about US\$ 35 billion. Floricultural products mainly consist of cut flowers, pot plants, cut foliage, seed tubers, rooted cuttings and dried flowers or leaves (Pandey, 2020). Urbanization and rising living standards of the people has led to steady increase in demand of flowers and flower products making floriculture as one of the most important commercial trades in Agriculture (Bhat *et al.*, 2022). Over the years, horticulture has emerged as one of the potential agricultural enterprise in accelerating the growth of economy. Its role in the country's nutritional security, poverty alleviation and employment generation programmes is becoming increasingly important. It offers not only a wide range of options to the farmers for crop diversification, but also provides ample scope for sustaining large number of Agro- industries which generate huge

employment opportunities (Planning Commission, 2001). Indian agriculture is witnessing a gradual change and the trend of last few decades shows diversification from field crops towards horticultural crops. In terms of increasing farmers' income, diversification towards flower cultivation results in higher profit per unit area than most of the field crops and therefore can enhance the livelihood of farmers (Sharma *et al.*, 2022). Extensive research has already been done in India to generate basic knowledge on multidisciplinary aspects of floricultural crops. Floriculture got an early lead and substantial gains in some areas. India's contribution in germplasm collections, characterisation, cytology, crop improvement and induced mutation are worth mentioning (Datta, 2019).

Speaking about areas receiving low rainfall, Arid states has taken an ornamental path and paved the way to produce tuberose, chrysanthemum, crossandra, marigold, jasmine and aster, in open fields along with ornamental cut flowers like rose, carnation, gerbera, tulip, liliun, alstroemeria, orchid and anthurium in the protected structures. Apart from production and marketing of these flowers, a major business is cultivation of flower saplings and foliage plants. The market opportunities are

(¹Assistant Professor-cum-Junior Scientist)

enormous due to their “low volume high value” potential despite of challenges. Thus, the arid floriculture appears to be a commercially viable option for the farmers to reap better profits (Janakiram *et al.*, 2018). Apart from flower, the main crop, the value-added products from contemporary floricultural crops—like essential oil of rose, tuberose, jasmine, tiger lily and the varied plants extracts extensively used in medicines and the pharmaceutical industry—are exclusive and likely to face much less competition in the international market after the World Trade Organization scenario. The TRIPS (Trade Related Aspects of IPRs) agreement helps a nation secure the sovereign rights to these products (Dhillon, 2015). India is enriched with diverse agro-climatic conditions such as fertile land, suitable climate, abundant water supply, low labour cost, availability of skilled manpower, etc. which are quite beneficial for growing a variety of flower plants throughout the year but the challenge lies with growth of floriculture industry in arid and semi arid regions with resource scarcity. Thus the present paper focuses on prospects of floriculture in India with special reference to arid and semi arid regions.

Impact of Climate Change on Floriculture Sector

Climate change decreases the global agriculture production and also affects production of Horticulture crops. Horticultural crops are highly perishable and very sensitive to unpredictable climate change. Abiotic stress includes temperature, drought, flooding, outbreak of insect increase and Carbon dioxide concentration. During recent years many research showed impact of climate change on horticultural Crops production and quality (Muchie and Assefa, 2021).

The impact of climate change on flowering plants and crops will be more pronounced. Melting of ice cap in the Himalayan regions will reduce chilling required for the flowering of many of the ornamental plants like Rhododendron, Orchid, Tulipa, Alstromerea, Magnolia, Saussurea, Impatiens, Narcissus etc. Some of them will fail to bloom or flower with less abundance while others will be threatened. Indigenous species in the natural habitat will be under threat for not getting favourable agro-climatic conditions for their proliferation. Western Ghats and surrounding regions may be deprived of normal precipitation due to abnormal monsoon. Plant species requiring high humidity and water may find them under

difficult conditions for survival. Plains of India will also have similar kind of problems and will be affected either by drought or excessive rains, floods and seasonal variations (Sharma and Roy, 2010). Climate change affect some flowers fail to bloom, others will produce flowers of smaller size, improper colour development and shorter blooming period. The production of flower crops grown on open field conditions like marigold, gladiolus, tuberose, rose, annuals will be affected by climate change. Other ornamentals such as orchids, rhododendrons, balsam which needs frost and low temperature for flowering are adversely influenced. The higher ambient temperature can have direct impact on volatile fragrances that the flowers emit, deterioration of pigments leading to dull shades, shift in insect pest and disease outbreaks, absence of winter chilling will reduce flowering, reduced post-harvest life, poor pollination and seed set (Prasad, 2018). Changing pattern in photoperiodism and thermo-periodism would greatly alter the flowering pattern in flowers such as chrysanthemum, poinsettia and carnation. Due to direct impact small scale players who depend on rain-fed floriculture will be extremely vulnerable to climate change (De L. C., 2018).

Delineation of Aridity in India

Crop water requirements are one of the critical issues (FAO, 1992), and it can be better judged if the seasonal degree of dryness was analyzed which reflects the crop water needs. There are several formulas given by scientists (Walton, 1969; Stadler,

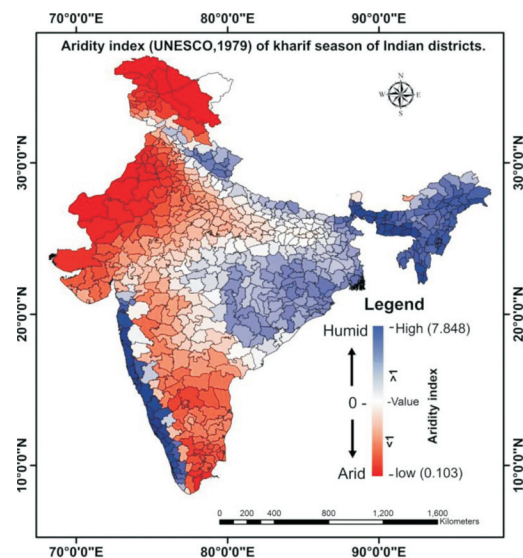


Fig. 1. Aridity Index map of India during Kharif season.

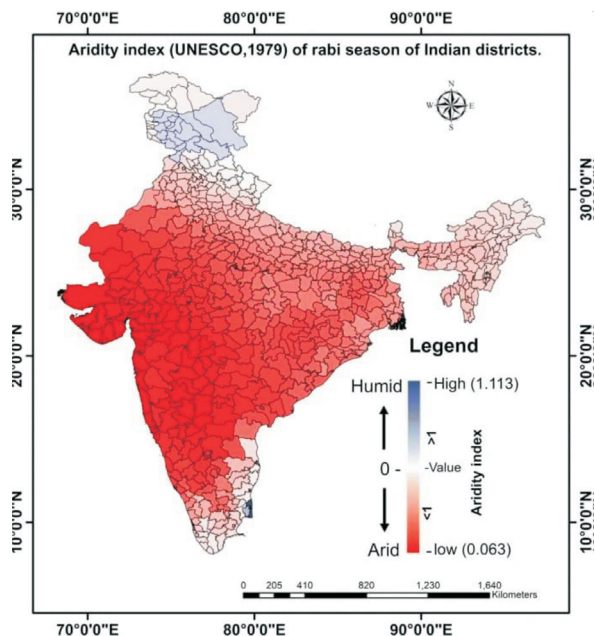


Fig 2. Aridity Index map of India during rabi season

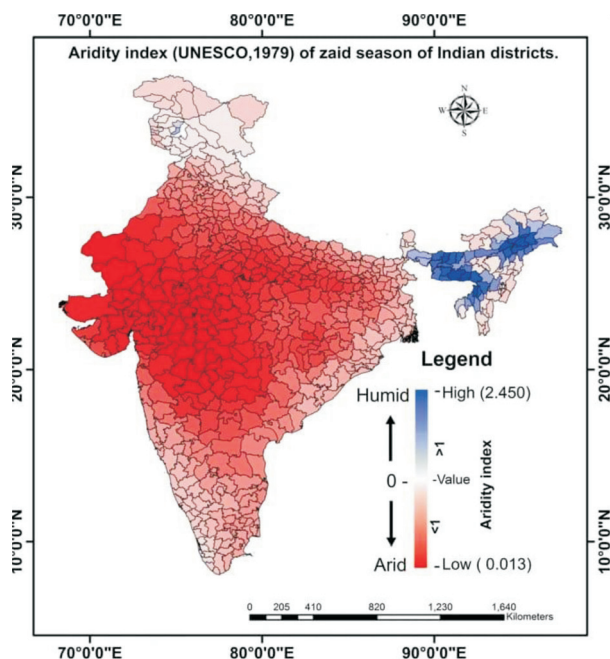


Fig. 3. Aridity Index map of India during Zaid season

2005) to quantify the aridity degree of dryness in the past which have some of their limitations (Maliva and Missimer, 2012). In this analysis, the aridity index formula (ratio of precipitation to potential evapotranspiration) given by UNESCO (1979) was adopted which is globally recognized (Maliva and Missimer, 2012; Trabucco and Zomer, 2019) and supports studies in agriculture sustainability as

adaptation to climate change (Zomer *et al.*, 2007, 2008). The AI for the seasons (kharif, rabi and zaid) was evaluated and analyzed the data up to the district level of India. The AI maps of India during kharif, rabi and zaid seasons are given in Figs. 1, 2 and 3, respectively.

MAJOR CONSTRAINTS IN FLORICULTURE PRODUCTION IN INDIA

Constraints of Floriculture Industry

- Even though Government of India recognizes the potential of floriculture industry and has conferred 100% export oriented industry status but due to so many bottle necks it is not developed as per expectations. As the flora industry is still in its primitive stage, it may be the reason, why it is facing many problems. Some of these are mentioned below:
- Unavailability of quality planting material.
- Lack of specific information on area and production of different flowers which lead to handicap for planning and production of flowers.
- Lack of information on novel/ruling varieties continuously keep changing in International market.
- Lack of advanced production technology like planting geometry, seed rate, nutrition, irrigation, management, grading, PP measures, etc
- Inadequate infrastructure facilities and very low volume Greenhouse, cold storage, etc for export oriented floriculture.
- Lack of Co-ordination among Govt. floriculture industry and growers and exporters. Floriculture industry is in hands of unorganised sector. Lack of linkages and synchronization among growers for collective dealings.
- No direct flights (cargo flights) from places like Bangalore and Pune which are major production centres in India results in double shipments which increases cost of transport and more scope for spoilage of flowers.
- Very high airfreight cost in India which makes production uncompetitive in International market as compared to African and Latin American countries.
- Lack of research especially in development of new varieties, PHT, production practices.
- There is no single window policy for financing for eg. NHB as loan where as APEDA gives subsidy
- Lack of quality planting material and heavy

royalty on imported varieties is a barrier for flower cultivation. Intrusion of commission agents and middlemen and lack of systematic market planning and strategy.

- Lack of suitable market survey and related information.
- Extension services should be strengthened as most of the research carried out in institution does not reaches to its true utilizers.

INNOVATIVE CONCEPT TO IMPROVE FLORICULTURE PRODUCTION IN ARID AND SEMI ARID REGIONS

Commercial floriculture opened up new avenues and arid regions are becoming the focused centres for producing quality nursery, pot and plug plants, cut and loose flowers, hybrid seed production and the value added products like dry flowers, essential oils, nutraceutical compounds and natural dyes.

(a) Plug Plant and Nursey Industry

(a) Plug Plant and Nursery Industry

Due to rapid urbanization and industrialization, the land has become a meager source and people are seeking for ready and easily transplantable plug plants which save money on land, resources, time and labour investment on weed control. Many ornamental cuttings, grafts, bedding and annual flower crops seedlings are being grown in plug trays under shade nets and low cost polyhouses (Singh *et al.*, 2017). In a quest to bring the humans close to nature, the society is more inclined towards purchase of potted plants. This has also opened a fresh avenue on plant rentals for interior decoration in corporate houses and offices. Kalanchoe, begonias, cyclamens, azalea, geranium, coleus, dracaena, dieffenbachia, pedilanthus, palms, ferns, crotons, cacti and succulents are some of the important pot plants with high market flow (Tarran *et al.*, 2007).

(b) Cut and Loose flower production

Cut and Loose Flower Production

In Indian arid context, low cost polyhouses are quite popular and several commercial ventures are coming up in the recent past to meet the ends of both domestic and export markets. Though there were several setbacks owing to high initial investment, respective state governments are providing handsome subsidies through existing schemes and after care for a certain period of time. The states like West Bengal, Karnataka, Maharashtra, Andhra

Pradesh, Odisha, U.P and Jharkhand have become the major hubs of cut flowers.

(c) Commercial Seed Production

The flower seed trade is a viable alternative and a vibrant segment to face the challenges of today's plant material scarcity. Even though, the subtropical climate is highly suitable for seed production of most of the flowering species, it could be extended by standardizing the appropriate growing conditions suitable for arid zone (Janakiram *et al.*, 2018).

CONCLUSION

Floriculture in India can be developed in arid and semi arid regions to meet purposes even on commercial ends. Presently this sector has not received much impetus in low rainfall areas. The focus still lies at ornamental gardening and landscaping due to shortage of resources and low risk bearing capacity of Indian farmers. But it has immense potential keeping in view the prospects of floriculture industry and demand in Indian market as well as to meet the export needs of the country. Once the challenges are taken care of, floriculture can be seen as blooming industry even in adverse climatic conditions. Thus necessary policies and further research in this sector can be suggested.

REFERENCES

- Bhat, Z. A., Khan, M.H., Wani, M.A., Hamid, B. and Nabi, S. 2022. Floriculture Business Triumphs All Other Farm Businesses: A Case Study. *International Journal of Research and Review*. 9(3): 2454-2237.
- Chawla, S.L., Patil, S., Ahlawat, T. and Agnihotri, R. 2016. Present Status, Constraints and Future Potential of Floriculture in India. *Commercial Horticulture*, pp. 29-38.
- Datta, S.K.D. 2019. Present Status of Research on Floriculture in India. *LS International Journal of Life Science*. 8(2): 71-93.
- De L. C. 2018. Impact of Climate Change on Floriculture and Landscape Gardening. *International Journal of Agricultural Sciences*. 10(11): 6253-6256.
- Dhillon, C. 2015. India must reap benefits of booming floriculture industry. Available from <https://www.downtoearth.org.in/blog/economy/india-must-reap-benefits-of-booming-floriculture-industry-51875>.
- FAO. 1992. Crop water requirements. Available from <http://www.fao.org/docrep/>
- Jankiram, T., Sanikommu, V. R. R. and Maddukuri, L. D. 2018. Prospects of Floriculture in Arid and Semi-Arid

- Regions of India. *National Conference on Arid Horticulture for Enhancing Productivity and Economic Empowerment, Bikaner, Rajasthan*.
- Maliva, R. and Missimer, T. 2012. Arid lands water evaluation and management. *Environ Sci Eng*. Available from https://doi.org/10.1007/978-3-642-29104-3_2
- Muchie, A. and Assefa, F. 2021. Impact of Climate Change on Horticultural Crops Production and Quality: A Review. *American Journal of Bioscience and Bioengineering*. 9(6): 156-161.
- Pandey, S.N. 2020. Commercial Floriculture: Scope and Importance in India. Available from https://www.lkouniv.ac.in/site/writereaddata/siteContent/202004131505182831snpandey_bot_Floriculture.pdf.
- Planning Commission, 2001. Report of the Working Group on Horticulture Development for Tenth Five Year Plan (Main Report). India.
- Prasad, K.V. 2018. In: *Proceedings of National Conference on Floriculture for Rural and Urban Prosperity in the Scenario of Climate Change, organized by ICAR-NRC for Orchids, Pakyong, Sikkim* (Eds. D.R. Singh, Laxuman Sharma, L.C. De and A.L. Meitei), 74- 75.
- Sharma, G., Sharma, P. and Pandey, A.K. 2022. Floriculture for increasing Indian Farmers income: Fitting in the Present Cropping System. *International Journal of Global Science Research*. 9(1): 1746-1754.
- Sharma, S.C. and Roy, R.K. 2010. Impact of Global Climate Change on Floriculture in India. *Environews*. 16(1).
- Singh, R.R., Meena, L.K. and Singh, P. 2017. High Tech Nursery Management in Horticultural Crops: A Way for Enhancing Income. *International Journal of Current Microbiology and Applied Sciences*. 6(6): 3162-3172.
- Stadler, S.J. 2005. Aridity indexes. In: Oliver JE (ed) *Encyclopedia of World Climatology*. Springer, Heidelberg, pp 89-94.
- Tarran, J., Torpy, F. and Burchett, M. 2007. Use of living pot-plants to cleanse indoor air research review. In *Proceedings of 6th International Conference on Indoor Air Quality, Ventilation and Energy Conservation, - Sustainable Built Environment*, pp. 249-256.
- Trabucco, A. and Zomer, R. 2019. Global aridity index and potential evapotranspiration. Available from <https://doi.org/10.6084/m9.figshare.7504448.v3>.
- UNESCO. 1979. Map of the world distribution of arid regions: explanatory note, vol 22. UNESCO, Paris. ISBN: 92-3-101484-6.
- Walton, K. 1969. *The Arid Zone*. Aldine Publishing Co, Chicago, IL.
- Zomer, R. J., Trabucco, A., Bossio, D. A. and Verchot, L. V. 2008. Climate change mitigation: a spatial analysis of global land suitability for clean development mechanism afforestation and reforestation. *Agricultural Ecosystem and Environment*. 126(1-2): 67-80. Available from <https://doi.org/10.1016/j.agee.2008.01.014>
- Zomer, R.J., Bossio, D.A., Trabucco, A., Yuanjie, L., Gupta, D.C. and Singh, V.P. 2007. Trees and water: smallholder agroforestry on irrigated lands in Northern India. International Water Management Institute, Colombo, (IWMI Research Report 122).
-