



PERSPECTIVE PLAN FOR HORTICULTURE IN TELANGANA-2035



Dr. D. Raji Reddy | Dr. A. Bhagwan | Dr. G. P. Sunandini



**SRI KONDA LAXMAN
TELANGANA HORTICULTURAL UNIVERSITY**

Mulugu (V & M), Siddipet District - 502279
Telangana, India

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MESSAGE

Horticulture plays a crucial role in providing the nutritional and income security to the farmers. Government of Telangana has identified horticulture as one of the growth engines in the economic development of the state and is focussing on area expansion as these crops record higher returns per unit area compared to agricultural crops. In addition to its economic significance, horticulture plays a major role in generating rural employment and promoting crop diversification.

In this direction, several central and state schemes viz., Micro Irrigation Project (TGMIP), MIDH, Rashtriya Krishi Vikas Yojana (RKVY), National Mission on Edible Oils – Oil Palm are being implemented in the state. In spite of above, the area under horticultural crops is decreasing which needs a strategic plan and concerted efforts by both the government and scientific community. It is a pleasure to see the perspective plan for horticulture development in Telangana-2035 prepared by Sri Konda Laxman Telangana Horticultural university depicting the road map for the comprehensive development of the horticulture sector in the state. The university has drawn strategic framework identifying goals and approaches to achieve these goals.

I congratulate Dr. D. Raji Reddy, Vice Chancellor and his team for taking the initiative in development of the document and hope that this will pave the way for nutritional security, economic wellbeing of the horticultural farmers in the state through intensive efforts of the all the departments and the university hand in hand.

(A. REVANTH REDDY)

TUMMALA NAGESWARA RAO
Minister for Agriculture, Marketing,
Co-operation and Handlooms & Textiles
Government of Telangana, Hyderabad.



Room No. 3F-27, 28 & 29, D-Wing,
Dr. B. R. Ambedkar, Telangana State
Secretariat, Hyderabad - 500002.

Phone : 040-23450533



FOREWORD

Horticulture contributes to agriculture in Telangana state with covering 6% of cropped area and 30% of Agricultural Gross Value Output. Despite its importance, the state has witnessed a decline in horticultural area and output since 2019-20. Encouragingly, efforts from 2023-24, especially in oil palm cultivation, have reversed this trend. However, long-term planning is essential, particularly for vegetable self-sufficiency.

It is a good augury that the “Perspective Plan for Horticulture in Telangana-2035” by Sri Konda Laxman Telangana Horticultural University offers a strategic roadmap based on demand projections, export needs, post-harvest considerations, and value addition. It outlines coordinated strategies for departments involved in horticulture development.

I commend Dr. D. Raji Reddy and his team for their commendable work. I hope this document will be a valuable guide for achieving sustainable, profitable, and nutrition-focused horticultural growth in Telangana.


TUMMALA NAGESWARA RAO

PREFACE

Telangana is the eleventh largest state, twelfth most populated state and ninth largest economy in India. Telangana has diverse agro-climatic conditions suitable for cultivation of different horticultural crops and climate is suitable for quality horticultural produce. Telangana ranks 12th in area and 16th in production of total horticultural crops in India. Mango, sweet orange, acid lime, guava, pomegranate, tomato, brinjal, oil palm, chilli and turmeric are the major horticultural crops cultivated in the state. Horticulture crops occupy 6% of the total gross cropped area in the state, contributing 30 per cent to the state's Agricultural Gross Value Output (GVO) in 2022-23 and have been identified as one of the growth engines for the development of Telangana State. The area under horticultural crops is very low in the state compared with the neighbouring states like Karnataka, Tamilnadu and Andhra Pradesh. Moreover, the state is not self-sufficient in vegetable crops and is forced to import from neighbouring states. To develop the horticulture sector in the state, a road map is required.

In this direction, a modest attempt is made in the development of “Perspective Plan for Horticulture in Telangana-2035”. The document has been prepared synthesizing the data from different sources, valuable inputs from the former Vice Chancellors, Retired Senior Professors and eminent scientists from Horticultural University and scientists from ICAR institutes, Department of Horticulture, Department of Agricultural Marketing, Telangana State Seed and Organic Certification Authority, APEDA and representatives from industry, farmers, FPOs, cooperatives, exporters and NGOs. The document discusses trends in the production of horticultural crops in the state in the last decade, the position of Telangana in area, production and productivity of different horticultural crops in the country, projected demand for fruits and vegetables by 2030 and 2035 based on ICMR recommendations, allowance

towards exports, post-harvest losses, processing and value addition. Another important component of the document is the depiction of significant achievements of the university in teaching, research and extension. The document has narrated a detailed roadmap and action plan up to 2035 and the role of different departments involved in the horticultural development in the state.

The efforts by Dr. A. Bhagwan and Dr. G. P. Sunandini, who have collected data from different sources, analysed and collated to arrive at valuable conclusions and prepared an action plan for the development of a roadmap of horticulture in Telangana are highly appreciated. The efforts of Dr. K. Veeranjanyulu, Dr. D. Lakshmi Narayana, Dr. J. Cheena, Dr. T. Suresh Kumar, Dr. M. Rajasekhar, Dr. A. Kiran Kumar, Dr. N. Seenivasan, Dr. D. Anitha Kumari, Dr. P. Prasanth, Dr. P. Saidaiah, Dr. Veena Joshi, Dr. G. Jyothi, Dr. G. Prabhavathi, Smt. V. Krishnaveni, Dr. V. Suchitra, Dr. G. Vijaya Krishna, Sri. B. Mahender, Sri. K. Nagaraju, Sri. K. Bhasker, Dr. V. Murali, Dr. K. Venkatalaxmi who have contributed, is duly acknowledged.

The efforts of Dr. I. Prabhakar Reddy, Principal Scientist (Retd.), ANGRAU and Dr. Pamidi Venkateswarlu, Horticulturist (Retd), ANGRAU in the critical review of the manuscript is gracefully acknowledged.

I hope that this document will provide direction for all the concerned and involved in overall horticultural development in the state and will be used as a guide for the developmental activities to meet the growing demand for horticulture products not only for our state but also for the deficit states in the country in the next decade.

D. Raji Reddy
Vice Chancellor
SKLTGHU

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Executive Summary

Telangana, a landlocked state in Southern India, became the country's 29th state on June 2, 2014. Telangana has diverse agro-climatic conditions suitable for the cultivation of different horticultural crops and the climate is suitable for quality horticultural produce. In 2023-24, the area under horticulture crops in the state was 11.91 lakh acres, producing 42.58 lakh metric tonnes. Mango, sweet orange, acid lime, guava, pomegranate, tomato, brinjal, oil palm, chilli and turmeric are the major horticultural crops cultivated in the state. Horticulture crops occupy 6 percent of the total gross cropped area in the state, contributing 30 percent to the state's Agricultural Gross Value Output (GVO) in 2022-23 and has been identified as one of the growth engines for the development of Telangana State.

Out of the total area under horticultural crops in the state during 2023-24, spices are grown in 36 percent area, closely followed by fruits in 35 percent, plantation crops in 19 percent and vegetables in 9 percent. Floriculture constitutes about 0.67 percent and medicinal and aromatic plants in 0.05 percent of the area. Area under fruit crops registered increase in the last decade from 3,77,977 acres in 2014-15 to 4,15,571 acres in 2023-24 with a peak of 4,49,367 acres in 2019-20. However, the growth rate in fruit crops is only 1.6 percent with the Coefficient of Variation (CV) at 6.77 percent indicating that though the growth is low, it is stable. Among the fruit crops mango, sweet orange, acid lime, guava and pomegranate are the major crops occupying 73.73, 13.95, 3.37, 3.43 and 0.52 percent of the area under fruit crops respectively.

Area under vegetable crops is decreasing after reaching the peak in 2018-19. The growth rate is negative at (-) 8.4 percent during the last decade with a very high CV of about 31 percent which has to be addressed immediately. All the vegetable crops followed the same trend. Among the vegetables, tomato, brinjal, onion, okra, green chilli and gourds occupy 26.55, 4.79, 9.39, 4.88, 8.50 and 9.18 percent of the area under vegetables during 2023-24. Area under plantation crops is increasing, but with a big jump from 2022-23. Oil palm is the major crop under plantation crops in Telangana and encouragement from the Government of Telangana state for oil palm cultivation has resulted in huge jump in area from 2022-23.



A major concern is the decrease in value of horticultural crops from 2011-12. Telangana contributes only around 2 percent of the value of horticultural crops in India. Fruits and vegetables contribute nearly 75 percent of the value of horticultural crops in Telangana, emphasizing the importance of these crops. In the year 2021-22, the percent of area under horticultural crops in cultivable land is low at 7 percent in Telangana compared to other southern states viz., 18.96 in Tamil Nadu, 18.60 in Andhra Pradesh, 20.36 in Karnataka and 71.06 percent in Kerala indicating huge scope for increase in area under horticultural crops in the state. Telangana contributes 1.65, 0.52, 0.49, 1.70, 0.001, 7.46 and 1.11 in the production of fruits, vegetables, aromatic and medicinal, flowers, plantation crops, spices and total horticultural crops in India respectively. Though Telangana ranks first in productivity of turmeric, ginger, chrysanthemum, second in red chilli and okra in 2023-24, the productivity is low in mango, guava, onion and tomato which needs to be increased.

Based on the present scenario and realizing the importance of horticulture in the state, Sri Konda Laxman Telangana Horticultural University has prepared the perspective plan for 2030 and 2035 for horticultural crops in Telangana considering present production and projected demand in 2030 and 2035. In addition to the secondary and primary data, views of the experts from scientific community of universities and ICAR institutes, Department of Horticulture, Department of Agricultural Marketing, Telangana State Seed and Organic Certification Authority, APEDA, industry, farmers, FPOs, cooperatives, exporters and NGOs were taken into consideration.

Demand for fruits for the years 2025, 2030 and 2035 is assessed as 23.18, 23.56 and 23.74 lakh metric tonnes with a deficit of 4.53, 4.91 and 5.09 lakh metric tonnes, based on the present production and considering population projections, ICMR recommendation of 100 g per day, allowance of 30 percent towards exports, 5 percent for processing and 30 percent towards post-harvest losses. Demand for total vegetables, leafy vegetables, tuber crops and other vegetables for the years 2025, 2030 and 2035 is assessed as 81.49, 20.37, 20.37 and 40.75 lakh metric tonnes; 82.83, 20.71, 20.71 and 41.41 lakh metric tonnes; 83.47, 20.87, 20.87 and 41.73 lakh metric tonnes respectively, considering population projections, ICMR recommendation of 400 g per day (100 g tuber crops, 100g leafy vegetables and 200g other vegetables),



allowance of 5 percent towards exports, 10 percent for processing and 30 percent towards post-harvest losses.

The following constraints were identified in the horticultural crop production in the state.

- 1) Production constraints:** Non profitable due to high cost of production, non-availability of quality seedlings in time, biotic and abiotic stresses, scarcity of labour during critical stages, non-availability of skilled labour, high wage rates, lack of proper machinery, crop insurance, late disbursement of loans, unsustainable income, non-integration with agriculture and livestock.
- 2) Marketing constraints:** Lack of marketing facilities at local place, high transportation costs, price fluctuations, involvement of middlemen, market intelligence, poor grading, cold storage and processing facilities.
- 3) Low returns per unit area**
- 4) Management and sustaining natural resources** like land, soil, water and biodiversity in the context of changing climate.

Based on the demand projections and constraints, strategies were formulated for different crops. Additional area is required to meet the deficit in estimated demand in fruit and vegetable crops as per the priority in the state. Besides area expansion, productivity enhancement through adoption of improved varieties and management practices will help in increasing the production and reducing the cost of production in the existing areas. Crop diversification, integration of horticulture with agriculture and livestock through suitable cropping systems and farming systems as per the resource availability will help in attaining high returns per unit area. Research on development of improved varieties, location specific technologies, climate resilient technologies and post-harvest management and value addition has to be intensified.



The following strategies are to be adopted for the crops surplus/deficit in the production.

Crops surplus in production

- Increase in export.
- Post harvest management and processing.
- Strengthening of marketing and infrastructure.
- Quality improvement.

Crops deficit in production

- Increase in area in cluster mode.
- Increase in productivity.
- Optimum resource use for increasing resource productivity.
- Reduce post-harvest losses.
- Farm mechanization.
- Processing and value addition.
- Strengthening marketing and infrastructure.
- Quality improvement.
- Strengthening research on crop improvement, production and protection technologies.

Area Expansion

Potential districts for area expansion under different fruits and vegetables were identified, taking into consideration of climate and soils. An area of 1.32 lakh acres has to be expanded under fruit crops like guava, papaya, banana, sapota, pomegranate, dragon fruit, grapes, date palm, fig, jamun, amla and custard apple in the identified potential districts in the next five years. The farmers should be discouraged for area expansion under mango and sweet orange. An area of 2.45 lakh acres has to be expanded under vegetables like tomato, brinjal, carrot, cabbage, cucumber, cauliflower, radish, onion, potato, leafy vegetables, ridge gourd, green



chilli, okra, bottle gourd, bitter gourd and beans in the potential districts in cluster mode in the next five years. Action plan for cultivation of off season/lean period vegetables is to be implemented. For year-round production of vegetables, staggered planting, cultivation under shade nets, protected cultivation in lean season are to be followed.

Increasing the Productivity

SKLTGHU technologies in fruits, vegetables, spices need to be implemented to harness maximum attainable yield. Weather based agro advisories are to be issued and followed on real time basis to minimize the losses. Custom Hiring Centers (CHCs) need to be established at least one in each mandal to help the small and marginal farmers. Capacity building programmes are to be conducted to horticulture officials, extension specialists, researchers and farmers to upgrade the professional skills.

Increasing the Production Potential

University has to develop climate resilient varieties, improved varieties and hybrids with high yield potential and tolerance to biotic and abiotic stresses and associated production and protection technologies for optimum and efficient utilization of resources and weather-based pest and disease forewarning models.

Post-harvest Management

For minimising the post-harvest losses, there is a need to develop infrastructural facilities like cold storage units, ripening chambers, vegetable market yards with storage facility, refrigerated transportation. More low-cost ventilated onion storage structures need to be established in onion growing areas. Awareness is to be created on proper harvesting and handling to reduce post-harvest losses. Export Oriented Integrated Pack Houses with suitable Infrastructure has to be created near airport for promotion of exports. Research on quality promotion, shelf life, storage and post-harvest handling, pesticide residue free produce and identification of Maximum Residual Levels (MRLs) of new molecules, processing and value addition need to be intensified.



Marketing

Farmer Producer Organizations (FPOs) are to be encouraged to facilitate collective marketing and strengthen pre- and post-harvest interventions. Sale of fruits and vegetables in the major market yards on pilot basis is the welcome step by the Government of Telangana in strengthening marketing of horticultural crops in the state and need to be implemented in true sense. A Market Intelligence Unit may be setup in SKLTGHU in collaboration with department of agricultural marketing for price forecasting of horticultural crops and need to be disseminated to farmers through research stations, KVKs, Department of Horticulture through different media.

By implementing the above action plan, the state will increase the production of horticultural crops in the next five years. Area expansion of fruits (1.32 lakhs acres) and vegetables (2.45 lakhs acres) will increase the anticipated returns on investment in the ratio of 1:4 with an estimated investment of Rs 921.40 crores towards inputs and 942.50 towards drip irrigation in a period of five years. Further, this investment can be aligned with Central and State Government subsidy schemes. Adoption of SKLTGHU technologies in the existing fruit crop area of Telangana will add an anticipated returns of Rs 1341 crores per annum to GSVA. The action plan can be implemented involving Department of Horticulture, SKLTGHU, NABARD, FPOs and other groups. Investment of Rs 75.00 crores by the Government of Telangana in addition to tapping of funds from Ministry of food processing and other schemes of GoI will give anticipated returns on investment in the ratio of 1:3 with the involvement of Department of Horticulture, Department of Agricultural Marketing, NABARD, APEDA, Ministry of food processing, FPOs, startups and other groups.



Agriculture and allied sectors form the backbone of Telangana's economy. These sectors employ 66.15% of the rural workforce and 47.34% of the state's workforce. The agriculture sector contributes around 15-17 percent of the Gross State Value Added (GSVA). Out of the total geographical area of over 276.95 lakh acres (112.08 lakh hectares), during 2022-23, 52.61% of the area is under Net Sown Area, around 24.70% is under Forest Cover, 7.62% is under Land put to Non-agriculture use, 5.78% is under Fallow land, 5.42% is under Barren and uncultivable land and the remaining area i.e., 3.87% is under culturable waste, permanent pastures & other grazing lands and Land under Miscellaneous tree crops which are not included in net area sown. During 2022-23 the gross area sown is 222 lakh acres out of which area under horticultural crops is around 6% (Telangana Socio Economic Outlook, 2024).

The total number of operational holdings in the state are 70,59,859 covering an area of 63,12,033.32 hectares with an average size of 0.89 hectare. The area operated by the marginal and small holders put together accounted for 68.19 percent of the total operated area though they formed 91.31 percent of the total holdings (2021-22 agricultural census).

After attaining food security, the next goal is nutritional security. Horticulture has lot of importance in nutritional security. Horticulture sector covers different crop groups viz., fruits, vegetables, flowers, spices and plantation crops. These crops play an important role in the development of the agriculture sector and the total economy of the state. This sector generates employment, provides raw material to various food processing industries, consumes less water as compared to agricultural crops. These crops are profitable and has greater scope for export. They are a source of nutrients, vitamins, minerals, flavors and dietary fibres. In India nearly 30 percent of our population continue to suffer from malnutrition and providing food security and access to balanced nutritious diet is very important to build the strong nation. Horticultural crops like fruits, vegetables and medicinal plants play an important role in providing balanced diet.



Telangana is endowed with a subtropical climate and soils suitable for cultivation of a variety of horticultural crops. Horticulture sector has been identified as one of the focus sectors for development of Telangana State. In 2023-24, the area under Horticulture crops in the state was 11.91 lakh acres producing 42.58 lakh MTs. mango, sweet orange, acid lime, guava, pomegranate, tomato, brinjal, oil palm, chilli, and turmeric are the major horticulture crops cultivated in the state. Horticulture crops occupy 6% of the total gross cropped area in the state contributing 30 percent to the state's Agricultural Gross Value Output (GVO) and is identified as key driver of growth in the Agriculture and Allied sectors in Telangana.



SWOC Analysis for Horticulture Sector in Telangana

Strengths

- Endowed with diverse agro climatic conditions suitable for horticultural crops
- Availability of irrigation water
- 24-hour electricity for farmers
- Proactive and supportive Government
- Technology back up from horticultural university

Weaknesses

- Small size of land holdings
- Erratic distribution of rain fall
- Lack of adequate cold storage facilities
- Involvement of intermediaries in marketing
- Less processing industries and low value addition
- Lack of labour availability
- Poor farm mechanisation
- Existing orchards with traditional varieties are not preferred in the export market

Opportunities

- Well-connected roads
- International airport
- Diverse agro climatic conditions favourable for quality horticultural produce

Challenges

- Weather extremes like drought, floods, heat wave and cold waves
- Soil degradation
- Absentee landlordism



Agro Climatic Zones of Telangana

The State of Telangana is divided into three agro-climatic zones viz., Northern Telangana Zone, Central Telangana Zone and Southern Telangana Zone based on the geographical characteristics and climatic conditions such as nature of soils, rainfall, temperature etc.



Agro Climatic Zones of Telangana State



Northern Telangana Zone

This zone comprises of 180 mandals distributed in 10 districts; Adilabad, Kumarambheem Asifabad, Nirmal, Mancherial, Nizamabad, Jagtial, Peddapalli, Kamareddy, Rajanna_Sircilla and Karimnagar. The zone has a geographical area of 33110.85 sq. km. The annual average rainfall of the zone is 1033 mm ranging from 867 mm to 1189 mm. South West monsoon season with 840 mm (81%) is the major share, whereas North East monsoon season 104 mm, winter season 30 mm and summer season 58 mm contributes 10, 3 and 6 percent respectively.

The annual mean temperature ranges from 26.7°C to 27.2°C, mean maximum temperature ranges from 33.1°C to 33.9°C, and minimum temperature ranges from 20.1°C to 20.9°C. The zone has very low mean minimum temperature during the winter season ranging from 15.7°C to 16.9°C and the mean maximum temperature during the summer season ranges from 38.7°C to 39.9°C. The dependable rainfall i.e., rainfall at 75% probability from June to October is ranged between 237mm to 812 mm.

Major soils in the zone include shallow black soils (18.4%) followed by deep calcareous soils (16.6%) and red clayey soils (15.2%). However, as a whole, red soils of different textures are predominant in this zone to an extent of 45 percent followed by black soils (24%) and calcareous soils (20%).

Predominant crops in this zone include mango, sapota, guava, custard apple, tomato, french beans, leafy vegetables, green chilli, turmeric, coriander, etc.

Central Telangana Zone

This zone comprises of 187 mandals distributed in 11 districts viz., Sangareddy, Medak, Siddipet, Jangaon, Warangal Urban, Warangal Rural, Mahabubabad, Jayashankar Bhupalpally, Mulugu, Bhadradri Kothagudem and Khammam. The total



geographical area of the zone is 38746.57 sq. km with an annual average rainfall of 978 mm. Rainfall range from 779 mm to 1213 mm and major contribution is from Southwest monsoon season with 758 mm (77%). Remaining rainfall receives from North East season, 121 mm (13%), winter season 24mm (2%) and summer season 75 mm (8%).

The annual mean maximum temperature of the zone ranges from 32.8°C to 33.7°C, minimum temperature ranges from 20.4°C to 22.4°C and mean temperature ranges from 26.8°C to 27.9°C. The mean minimum temperature during the winter season ranges from 16.6°C to 18.7°C and the mean maximum temperature during the summer season ranges from 37.2°C to 38.9°C. The dependable rainfall i.e., rainfall at 75% probability from June to October is ranged between 250 mm and 766 mm.

The major soil groups in the zone are red shallow gravelly soils (12.4%) followed by red clayey soils (12.2%), deep calcareous soils (9%), red gravelly loam (8.5%) and colluvial soils (8%). Red type of soils, as a whole occupies 54 percent followed by calcareous soils (13%), colluvial soils (8%) and black soils (6%).

Major crops in this zone include mango, guava, banana, custard apple, oil palm, palmyrah, coconut, cashew nut, pomegranate, papaya, chilli, paprika, gourds, tomato, brinjal, potato, onion, green chilli, watermelon, dolichus beans, leafy vegetables, turmeric and ginger etc.,

Southern Telangana Zone

This zone comprises of 217 mandals distributed in 12 districts viz., Vikarabad, Medchal_Malkajgiri, Hyderabad, Yadadri_Bhuvanagiri, Rangareddy, Mahabubnagar, Nalgonda, Suryapet, Wanaparthy, Nagarkurnool, Narayanpet and Jogulamba_Gadwal. The total geographical area of the zone is 40177.23 sq. km. The annual average rainfall of the zone is 731 mm ranging from 606 mm to 853 mm. 524 mm (71%) rainfall is



received during Southwest monsoon season followed by North East 130 mm (18%), winter season 17 mm (2%) and summer season 61 mm (8%).

The annual mean maximum temperature of the zone ranges from 33.2°C to 33.9°C, minimum temperature ranges from 20.6°C to 22.1°C and mean temperature ranges from 26.9°C to 27.8°C. The mean minimum temperature during the winter season ranged from 16.9°C to 18.3°C and the mean maximum temperature during the summer season ranges from 38.2°C to 38.9°C. The dependable rainfall i.e., rainfall at 75% probability from June to October is ranged between 166mm to 469 mm.

Predominant soils of the zone are red clayey soils (22.3%) followed by red gravelly loam (16.5%) and alluvio-colluvial soils (14.4%). As a whole, the zone is dominated by different textured red soils with varied depths to an extent of 54.8 percent followed by alluvial-colluvial soils and calcareous soils (11.2%).

Major crops in this zone include grapes, papaya, sweet orange, acid lime, banana, mango, sitaphal, pomegranate, tomato, brinjal, bhendi, gourds, gherkins, colocasia, sweet potato, onion, leafy vegetables, green chilli, cucumber, water melon, flower and aromatic plants.



Status and Growth of Horticulture in Telangana in the Last Decade

Over the years, horticulture has emerged as an indispensable part of agriculture, offering a wide range of choices to the farmers for crop diversification and the state witnessed a steady increase in area, production and utilisation of horticultural crops. However, it has gained more importance due to more awareness about nutritional security and health care after Covid 19 incidence in 2020 both at national and at state level. The data on area and production in the state for the last 10 years, collected from Department of Horticulture, Government of Telangana is analysed and presented.

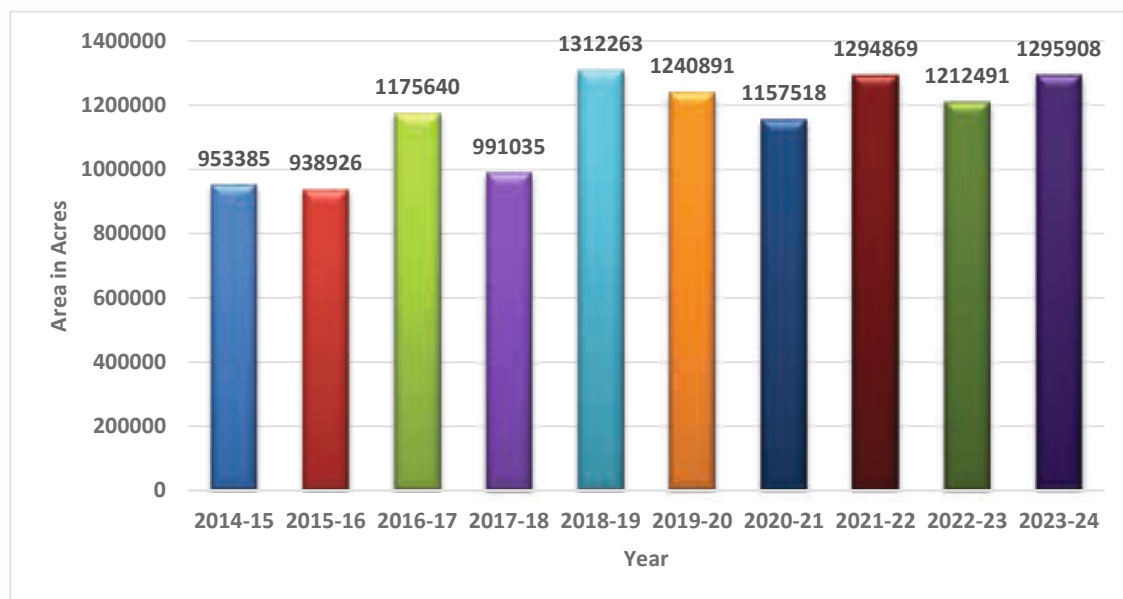


Figure 1: Horticulture area including agro forestry (acres) from 2014-15 to 2023-24

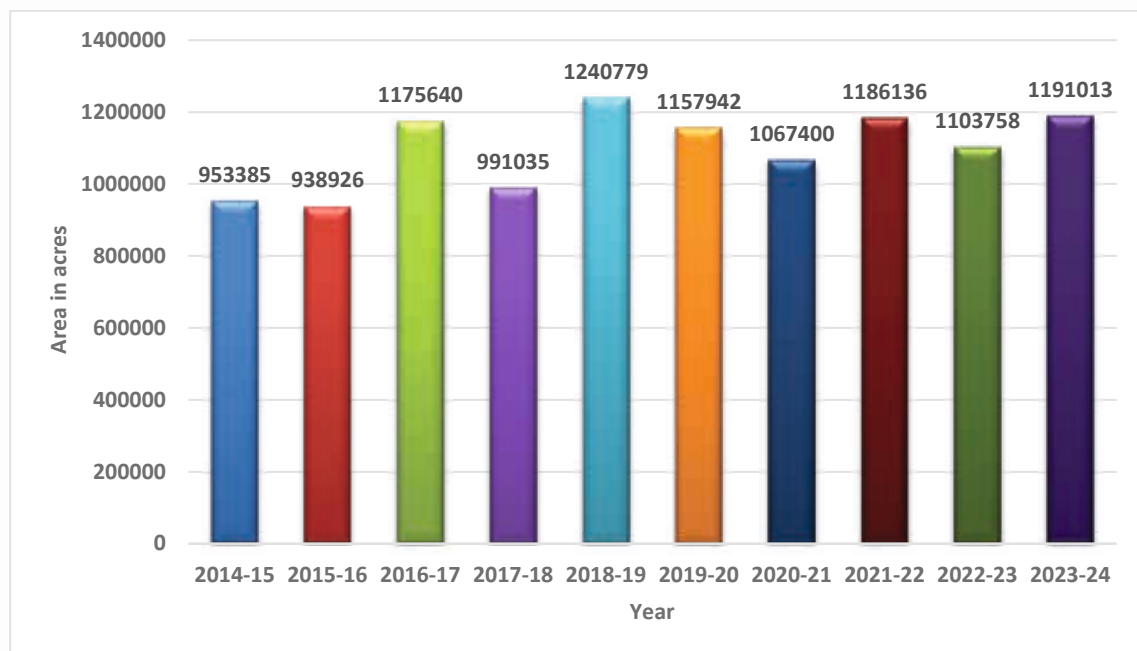


Figure 2: Horticulture area excluding agro forestry (acres) from 2014-15 to 2023-24

Above data indicates that though area under horticultural crops including agroforestry increased from 9,53,385 acres in 2014-15 to 12,95,908 acres in 2023-24, the growth rate is only 3.35 percent per annum with 12.5 percent of Coefficient of Variation (CV) indicating high year to year variability in the area and the growth is not stable. Area under horticultural crops excluding agroforestry also increased from 9,53,385 acres in 2014-15 to 11,91,013 acres in 2023-24. Growth rate is 2.03 percent with a CV of 9.81 percent. In the same period, area under rice increased from 129.04 lakh acres in 2014-15 to 232.58 lakh acres in 2022-23. The percentage increase is about 8.23 %. When compared to increase in rice area in the state during the same period, growth in horticultural crops is very less, whereas the consumption and demand for horticultural crops is increasing rapidly compared to rice and cereals which needs attention. Horticulture sector in the state encompasses a wide range of crops namely fruit crops, vegetables crops, flower crops, spices, medicinal & aromatic and plantation crops.



Table 1: Area and Production of Horticultural Crops in Telangana (2023-24)

Sl. No	Crops	Area in lakh Acres	% to total Area	Production in Lakh MT	% to total Production
1	Fruits	4.15	34.85	18.64	43.78
2	Vegetables	1.12	9.40	11.17	26.23
3	Spices	4.33	36.36	9.31	21.86
4	Plantation crops	2.21	18.56	2.85	6.69
5	Flower crops	0.08	0.67	0.56	1.32
6	Medicinal plants	0.003	0.03	0.02	0.05
7	Aromatic crops	0.002	0.02	0.01	0.02
	Total	11.91	100.00	42.58	100.00

Source: Department of Horticulture, Govt of Telangana

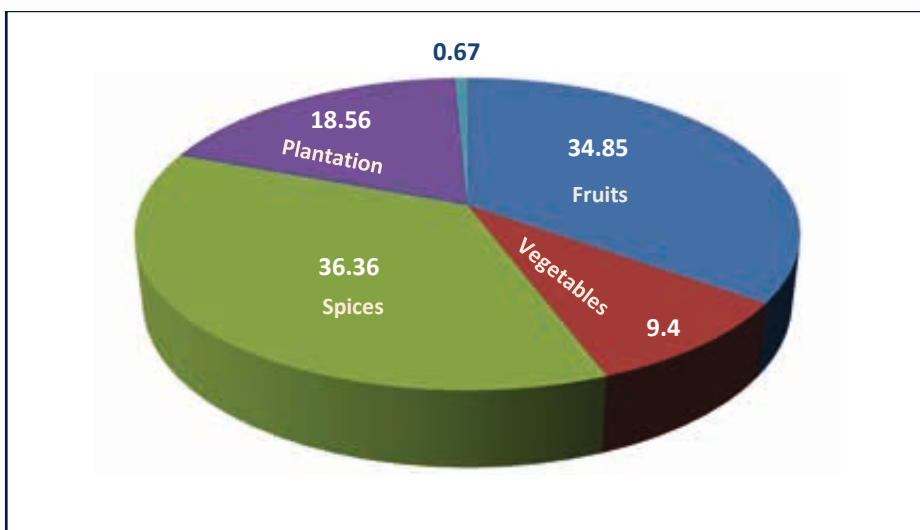


Figure 3: Area (Percent) under Horticultural crops in Telangana (2023-24)

During the year 2023-24, spices occupied 36 percent of the area followed by fruits, plantation crops and vegetables.



Area under Horticultural Crops in Telangana in the Last Decade

Area under fruit crops also registered increase in the last decade from 3,77,977 acres in 2014-15 to 4,15,571 acres in 2023-24 with peak of 4,49,367 acres in 2019-20. However, the growth rate in fruit crops is only 1.6 percent with the Coefficient of Variation at 6.77 percent indicating that though the growth is low, it is stable.



Figure 4: Area under Fruit Crops (Acres) from 2014-15 to 2023-24

Among the fruit crops mango, sweet orange, acid lime, guava and pomegranate are the major crops occupying 73.73, 13.95, 3.37, 3.43 and 0.52 percent of the area under fruit crops respectively.

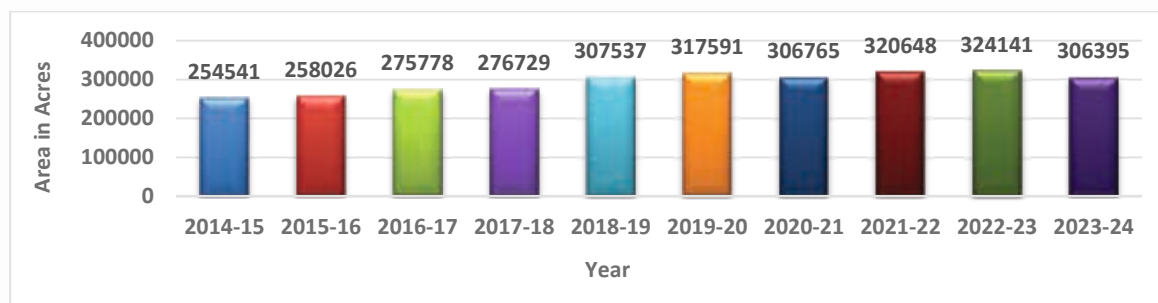


Figure 5: Area under mango (acres) from 2014-15 to 2023-24



Area under mango increased up to 2019-20, decreased in 2020-21 and again started increasing in 2021-22 and 2022-23 and decreased in 2023-24. At present the area is 3,06,395 acres.

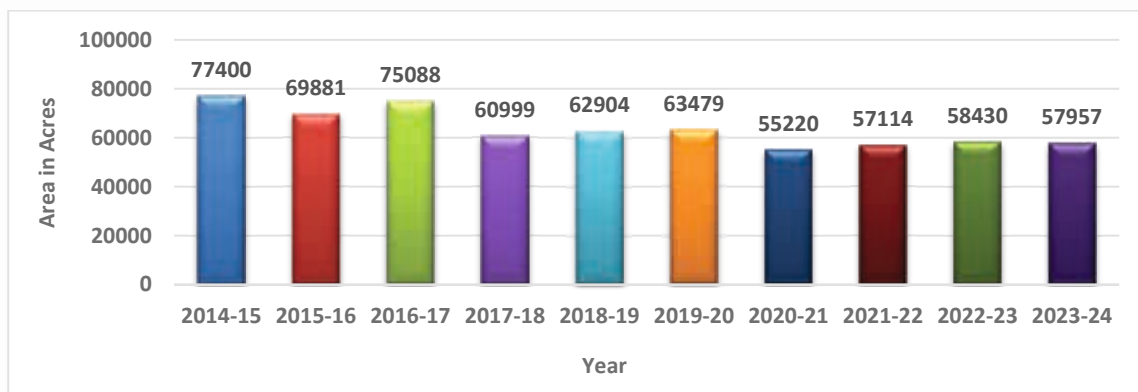


Figure 6: Area under sweet orange (acres) from 2014-15 to 2023-24

Area under sweet orange reduced from 2014-15 to 2017-18, but increased in 2018-19 and 2019-20 and is fluctuating from 2020-21 to 2023-24 and decreased again in 2023-24.

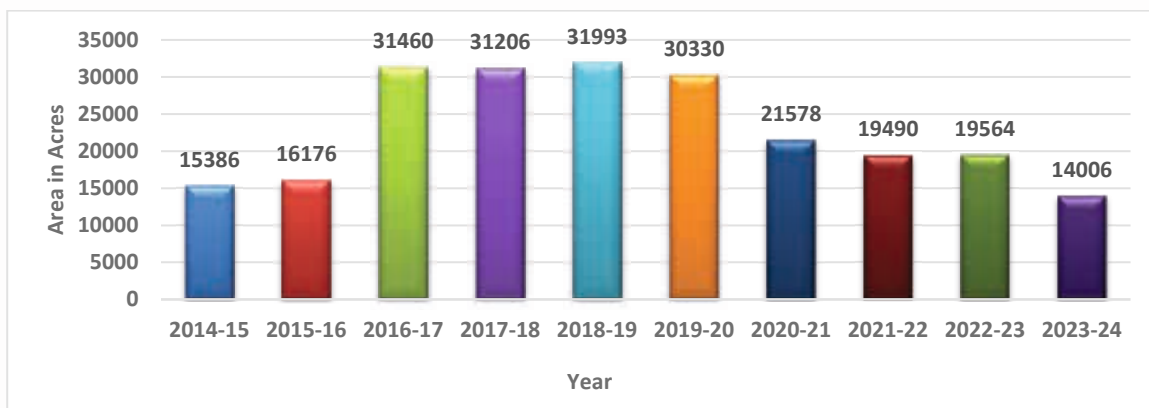


Figure 7: Area under acid lime (acres) from 2014-15 to 2023-24

Area under acid lime increased up to 2018-19 and started decreasing from 2019-20 mainly due to dry root rot disease.

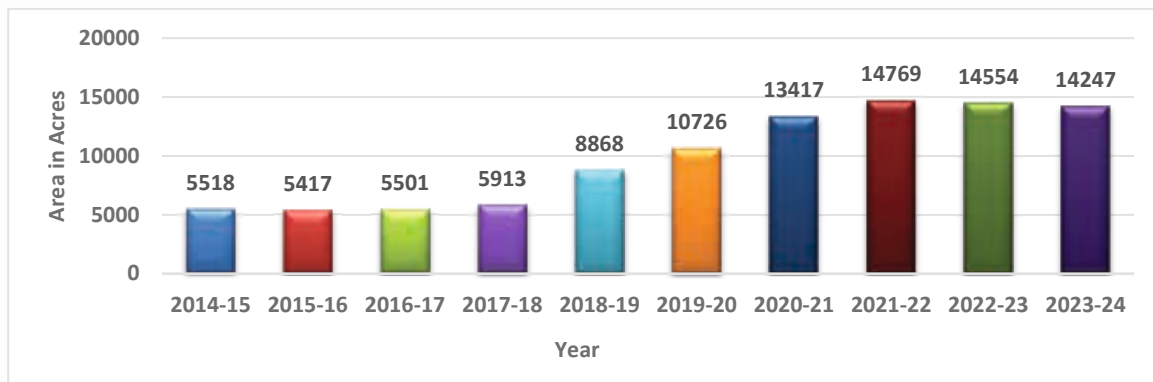


Figure 8: Area under guava (acres) from 2014-15 to 2023-24

Area under guava is increasing from 2014-15 indicating the importance of the crop in the state.

It is observed that area under vegetable crops is decreasing after reaching the peak in 2018-19. The growth rate is negative at (-) 8.4 during the last decade with a very high CV of about 31 percent which needs concern and the reasons are to be explored. All the vegetable crops followed the same trend. Among the vegetables tomato, brinjal, onion, okra, green chilli and gourds occupy 26.55, 4.79, 9.39, 4.88, 8.50 and 9.18 percent of vegetable area during 2023-24.

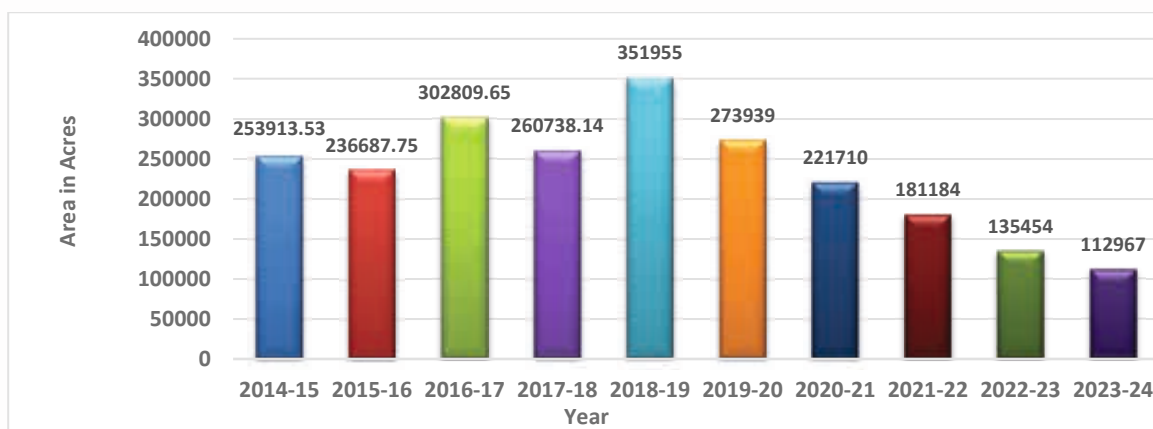


Figure 9: Area under vegetables (acres) from 2014-15 to 2023-24

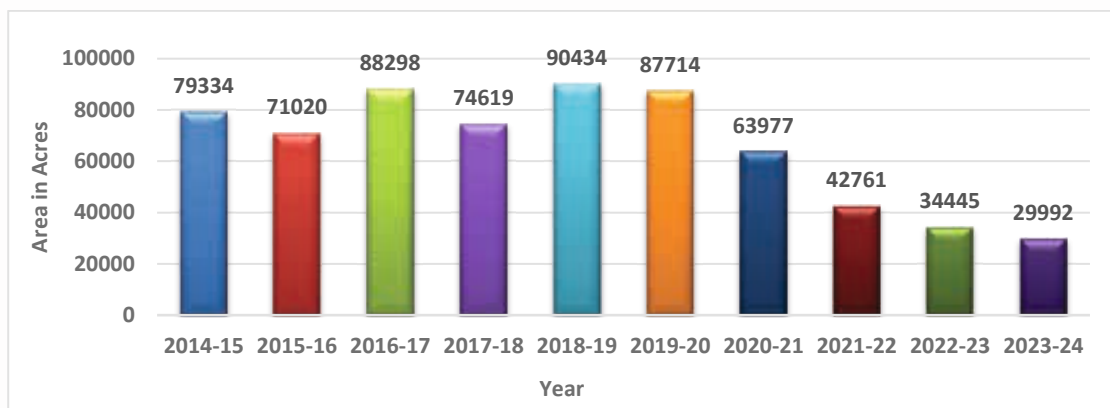


Figure 10: Area under tomato (acres) from 2014-15 to 2023-24

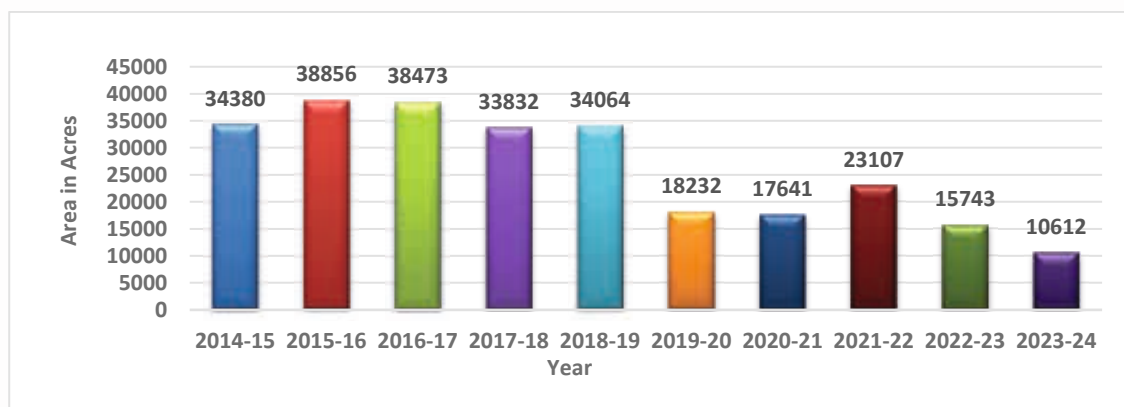


Figure 11: Area under onion (acres) from 2014-15 to 2023-24

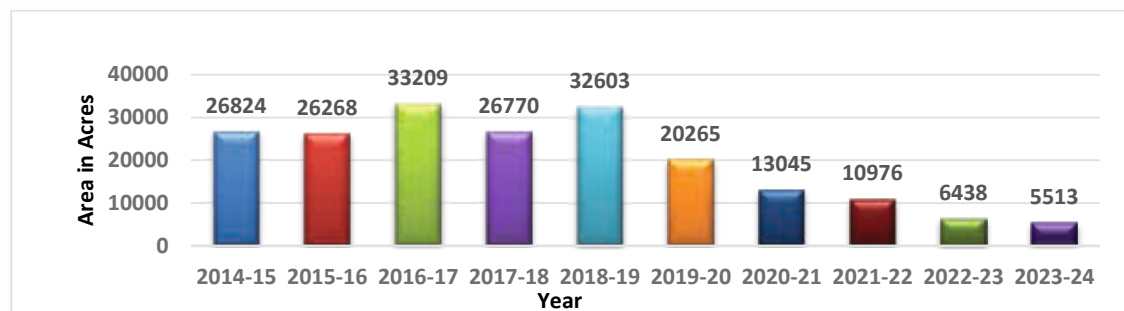


Figure 12: Area under okra (acres) from 2014-15 to 2023-24

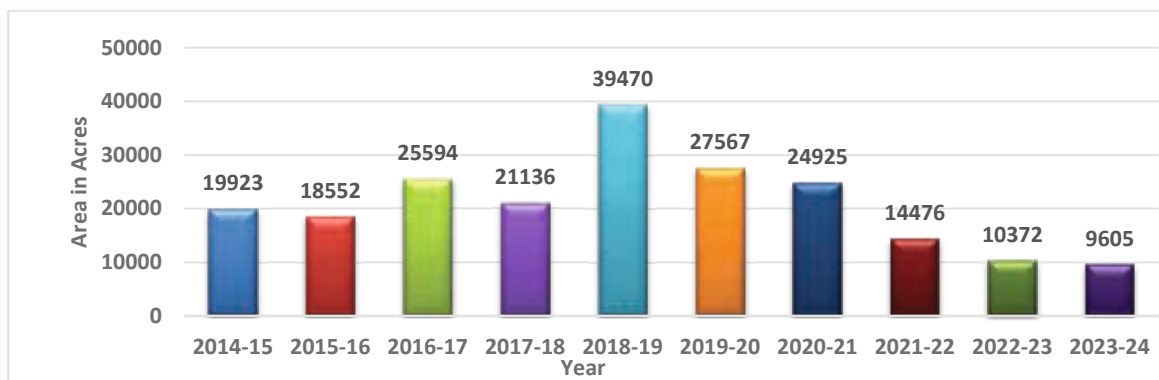


Figure 13: Area under green chilli (acres) from 2014-15 to 2023-24

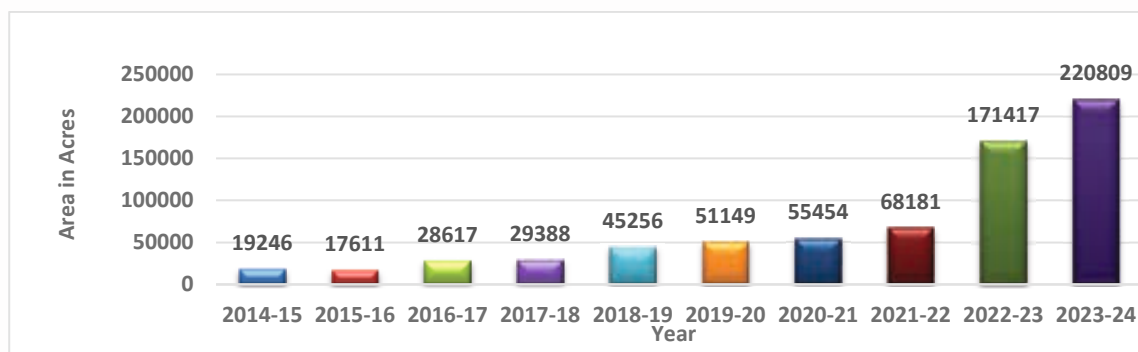


Figure 14: Area under plantation crops (acres) from 2014-15 to 2023-24

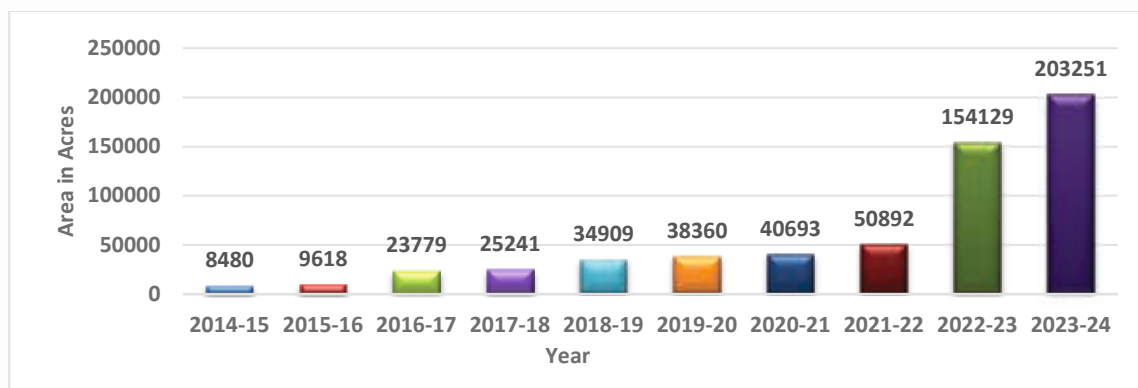


Figure 15: Area under oil palm (acres) from 2014-15 to 2023-24



Area under plantation crops is increasing but with a big jump from 2022-23. Oil palm is the major crop under plantation crops in Telangana which caused huge jump in area from 2022-23. By 2020-21, only 40,694 acres in Telangana were covered under Oil palm cultivation, limited to four districts: Khammam, Bhadrachalam, Kothagudem, Nalgonda and Suryapet. With the National Mission on Edible Oils-Oil Palm (NMEO-OP) launched in 2021-22, the program expanded statewide, excluding Hyderabad and Medchal Malkajgiri. By 2023-24, Oil palm cultivation in Telangana has reached around 2.03 lakh acres. The state government vigorously promotes Oil palm cultivation to diversify crop production and enhance farmers' income. It is aiming to cover 1 lakh acres in 2024-25 under the NMEO-OP scheme and farmers will receive support throughout the process, including assistance with garden upkeep, inter-cropping guidance and agronomic support to improve yields and income. The plan for 2024-25 to 2028-29 aims to expand to 3.50 lakh acres (Telangana Socio Economic Outlook, 2024).

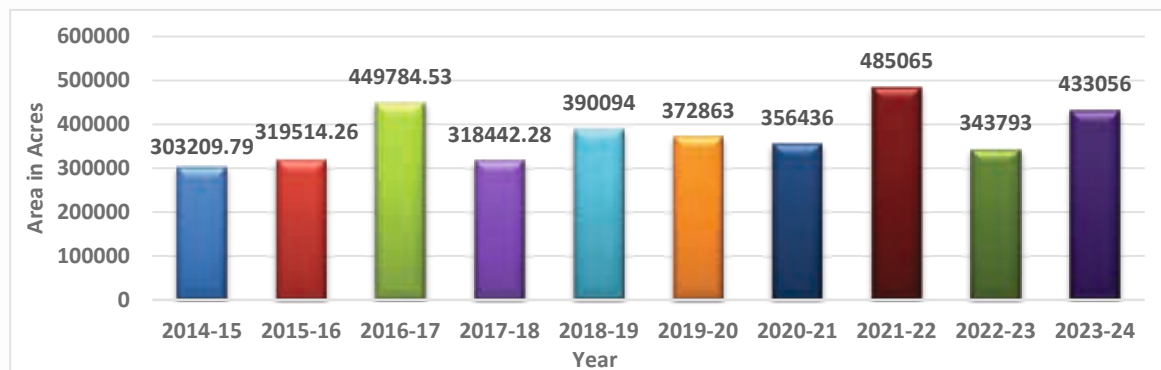


Figure 16: Area under spices (acres) from 2014-15 to 2023-24

It is observed that area under spices is increasing at a growth rate of 2.69 percent but showing very wide fluctuations with a CV of 16 percent. Area under red chilli, turmeric and ginger account for 90.59, 8.08 and 0.45 percent under spices during 2023-24. The fluctuations under spices are majorly contributed by the fluctuations in area of red chilli. Area is decreasing under turmeric from 2019-20 and under ginger from 2020-21.

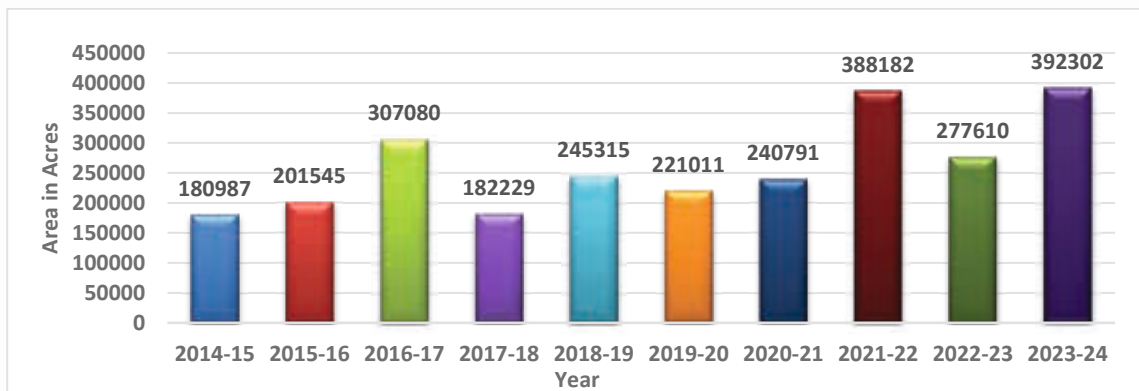


Figure 17: Area under red chilli (acres) from 2014-15 to 2023-24

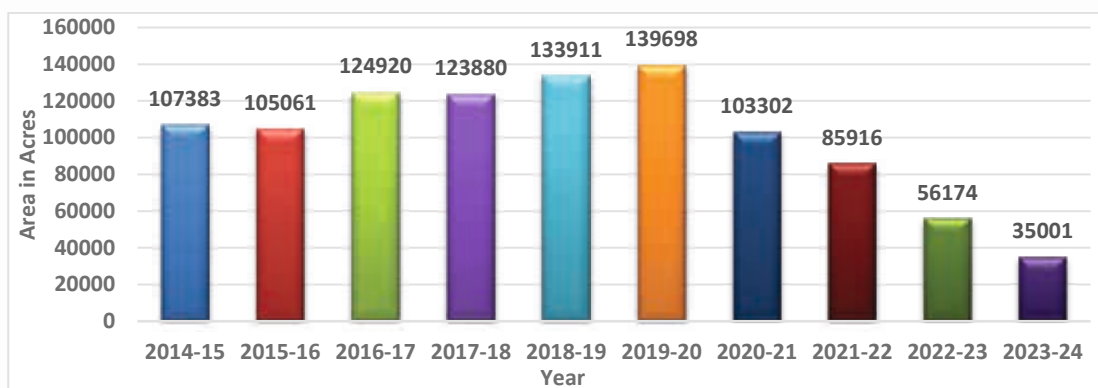


Figure 18: Area under turmeric (acres) from 2014-15 to 2023-24

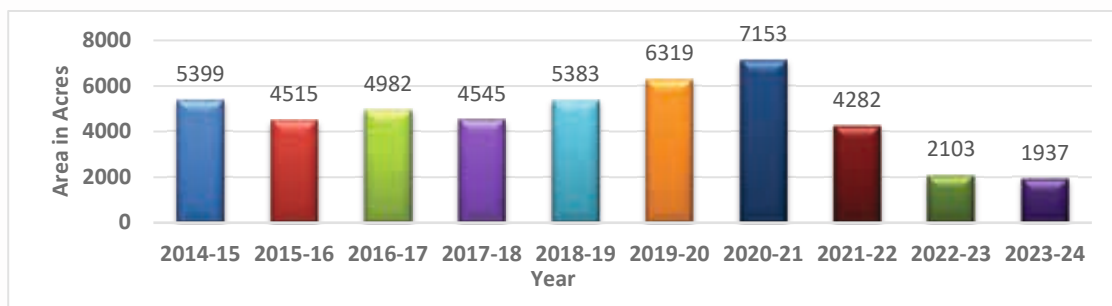


Figure 19: Area under ginger (acres) from 2014-15 to 2023-24

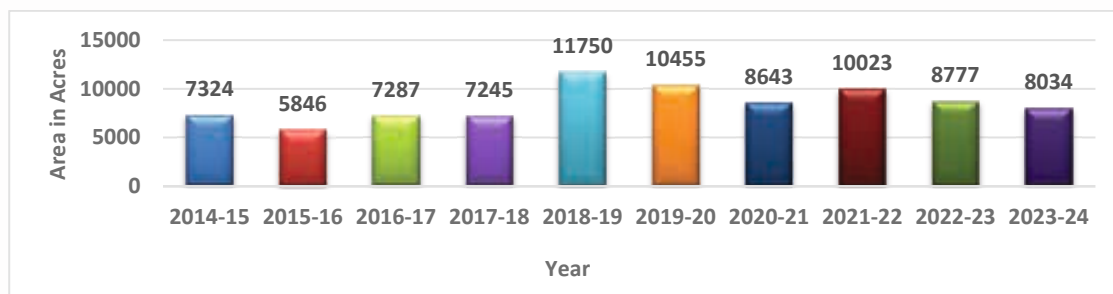


Figure 20: Area under flower crops (acres) from 2014-15 to 2023-24

Area under flower crops increased up to 2018-19 and started decreasing from 2019-20.

Production of Horticultural Crops in Telangana in the Last Decade

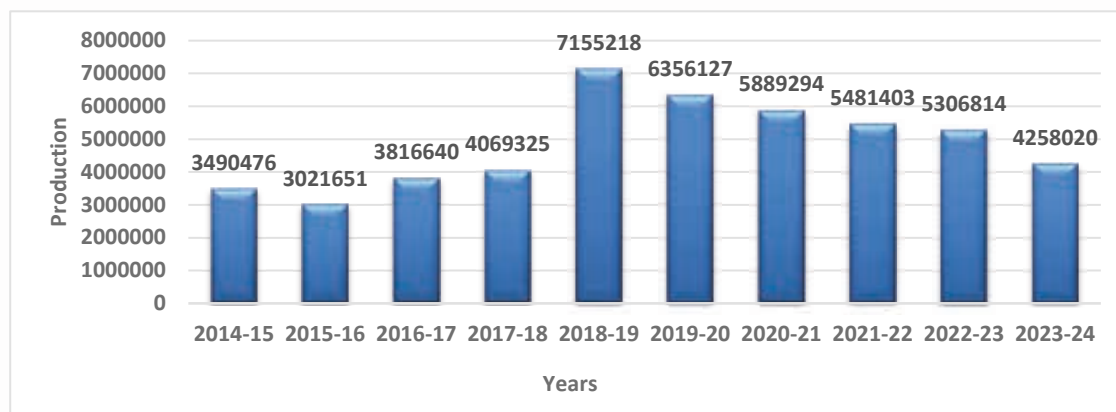


Figure 21: Production (Metric Tonnes) of total Horticultural crops from 2014-15 to 2023-24

The production under total horticultural crops increased up to 2018-19 and decreased afterwards. The production of total horticultural crops increased with an annual growth rate of 5.31 and Coefficient of Variation of 30 percent against growth rate of 2.03 percent with a variation of 9.81 percent in area indicating increase in productivity and high fluctuations in productivity in the same period.



Figure 22: Production (Metric Tonnes) of fruit crops from 2014-15 to 2023-24

The production of fruit crops increased with an annual growth rate of 7.12 and Coefficient of Variation of 27 percent against growth rate of 1.6 percent with the Coefficient of Variation at 6.77 in area indicating that though the area is stable there is high variation in production due to variation in productivity. Mango and Sweet orange contribute 50 and 21 percent of fruit crop production indicating the importance of these two crops in the state.

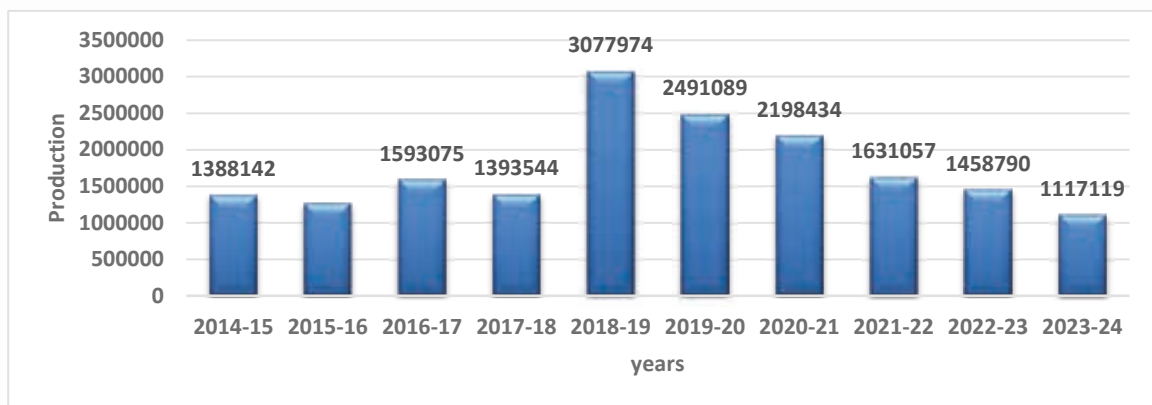


Figure 23: Production (Metric Tonnes) of vegetable crops from 2014-15 to 2023-24

As seen in area, production under vegetable crops also increased up to 2018-19 and then decreased. Vegetable crops production registered annual growth rate of 0.17 percent and co efficient of variation of 36 percent. The growth rate in area is negative



at (-) 8.4 percent during the same period but could be compensated to some extent with the increase in productivity. Out of the total vegetable production, tomatoes contribute 33 percent. Onion, gourds and leafy vegetables contribute 9.6, 9.8 and 5.4 percent of vegetable production respectively in the state.

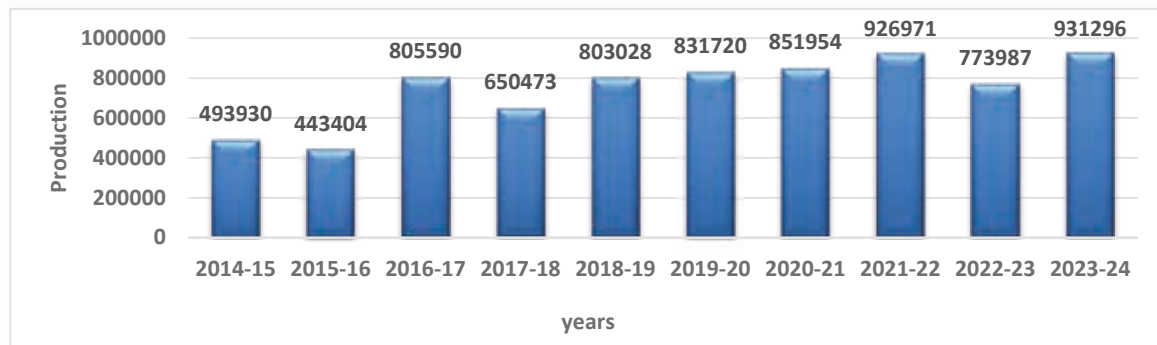


Figure 24: Production (Metric Tonnes) of spices from 2014-15 to 2023-24

The production of spices during last decade has recorded a good annual growth rate of 6.99 percent but has recorded a high Coefficient of Variation at 23 percent indicating wide fluctuations in the year-to-year production. Compared with 2.69 percent growth of area and Coefficient of Variation of 16 percent, it can be inferred that there is good growth in productivity but with wide fluctuations. Out of the total spice production, red chilli is the major contributor with 85 percent followed by turmeric with 12 percent.

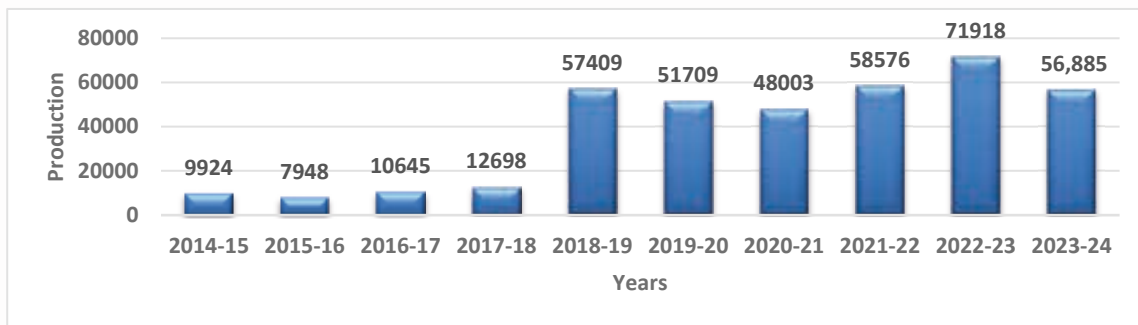


Figure 25: Production (Metric Tonnes) of flowers from 2014-15 to 2023-24



The production of flowers during last decade has recorded a very good annual growth rate of 30 percent but has recorded a very high Coefficient of Variation at 65 percent. The production started increasing from 2018-19 and reached peak in 2022-23. Among flowers, chrysanthemum and marigold are the major crops contributing 61 and 21 percent of total flower production respectively.

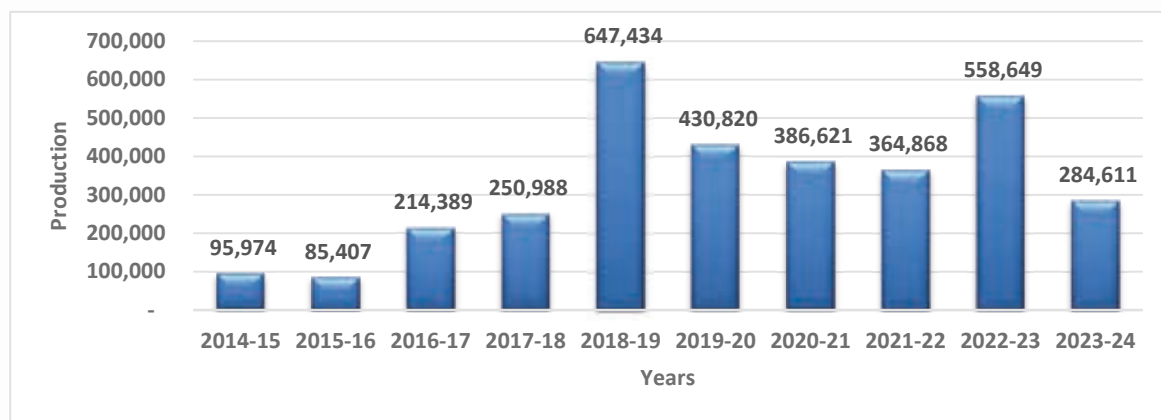


Figure 26: Production (Metric Tonnes) of plantation crops from 2014-15 to 2023-24

Production under plantation crops though registered a high growth rate of 24 percent also registered a very high variation of 57 percent indicating the growth is not stable.

Table 2: Value of horticultural crops output (Rs in lakhs) in Telangana at current prices

Crops /Year	2011-12	2015-16	2016-17	2017-18	2018-19	2019-20
Total horticulture	1391136	1783709	1261351	1765123	1699485	2065628
Fruits and vegetables	1035789	1416101	557876	1161223	1104002	1321805
Spices and condiments	306224	352838	690159	579095	558677	665421
Flowers	40273	11961	9310	18271	27069	61749
Plantation	6291	252	1449	3976	7179	14095

Source: Horticultural statistics at a glance, 2021, GoI



Table 3: Value of horticultural crops output (Rs in lakhs) in Telangana at constant (2011-12) prices

Crops /Year	2011-12	2015-16	2016-17	2017-18	2018-19	2019-20
Total horticulture	1391136	1117854	806933	971551	993297	1153518
Fruits and vegetables	1035789	851573	323318	573741	550973	622164
Spices and condiments	306224	254400	473606	379165	419196	487095
Flowers	40273	9119	6271	12942	15201	33365
Plantation	6291	204	1180	3144	5369	8336

Though the value of horticultural output has increased from 2015-16 at current prices, the value at constant prices has decreased indicating that the growth is not on real terms and the sector needs more attention to achieve real growth.

Table 4: Value of horticultural crops output (Percent to total horticultural crops) at current prices

Crops /Year	2011-12	2015-16	2016-17	2017-18	2018-19	2019-20
Fruits and vegetables	74.46	79.39	44.23	65.79	64.96	63.99
spices and condiments	22.01	19.78	54.72	32.81	32.87	32.21
Flowers	2.89	0.67	0.74	1.04	1.59	2.99
Plantation	0.45	0.01	0.11	0.23	0.42	0.68



**Table 5: Value of horticultural crops output (Percent to total horticultural crops)
at constant (2011-12) prices**

Crops /Year	2011-12	2015-16	2016-17	2017-18	2018-19	2019-20
Fruits and vegetables	74.46	76.18	40.07	59.05	55.47	53.94
Spices and condiments	22.01	22.76	58.69	39.03	42.21	42.23
Flowers	2.89	0.82	0.78	1.33	1.53	2.89
Plantation	0.45	0.02	0.15	0.32	0.54	0.72

The share of fruits and vegetables increased in 2015-16 and decreased drastically in 2016-17 and again increased. The share of spices and condiments is maximum in 2016-17 and again decreased. The share of flowers and plantation crops remained almost same in these years.



Comparative Performance of Horticulture in Telangana and India

Indian horticulture sector contributes about 33% to the agriculture Gross Value Added (GVA) making very significant contribution to the Indian economy. Apart from ensuring nutritional security of the nation, it provides alternate rural employment opportunities, diversification in farm activities and enhanced income to farmers.

India has witnessed increase in horticulture production over the last few years. Significant progress has been made in area expansion of different horticulture crops resulting in higher production. Over the last decade (2011-12 to 2020-21), the area under horticulture grew by 2.1% per annum and annual production increased by 3.9%. During 2020-21, the production of horticulture crops was 334.60 million tonnes from an area of 27.74 million hectares. The production of vegetables has increased from 156.33 million tonnes to 200.45 million tonnes since 2011-12 to 2020-21 and production of fruits has increased from 76.42 million tonnes to 102.48 million tonnes since 2011-12 to 2020-21. The percentage distribution of total horticulture crops in the country is the highest for vegetables (58 – 61%) followed by fruits (29 - 32%) and plantation crops (5 – 6 %) over the last ten years. The production of horticulture crops has outpaced the production of food grain since 2012-13. Compound Annual Growth Rate (CAGR) in horticulture production in India during 2011-12 to 2020-21 is 2.96%. Compound Annual Growth Rate (CAGR) in horticulture area during 2011-12 & 2020-21 is 1.88%.

(Source: Horticultural statistics at a Glance 2021, Horticultural Statistics Division, Dept of Agriculture & Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, GoI).



**Table 6: Value of horticultural crops output (Rs in lakhs)
at constant (2011-12) prices in Telangana and India**

Crops /Year	2011-12	2015-16	2016-17	2017-18	2018-19	2019-20
Total horticulture						
Telangana	1391136	1117854	806933	971551	993297	1153518
India	37690000	43350000	45720000	48310000	49990000	51980000
% to India	3.69	2.58	1.76	2.01	1.99	2.22
Fruits and vegetables						
Telangana	1035789	851573	323318	573741	550973	622164
India	28740000	33530000	35290000	36950000	37360000	38330000
% to India	3.60	2.54	0.92	1.55	1.47	1.62
Spices and condiments						
Telangana	306224	254400	473606	379165	419196	487095
India	4640000	5150000	5690000	6260000	6930000	7670000
% to India	6.60	4.94	8.32	6.06	6.05	6.35
Flowers						
Telangana	40273	9119	6271	12942	15201	33365
India	1740000	1970000	2170000	2360000	2640000	2700000
% to India	2.31	0.46	0.29	0.55	0.58	1.24
Plantation						
Telangana	6291	204	1180	3144	5369	8336
India	2570000	2700000	2570000	2740000	3060000	3280000
% to India	0.24	0.01	0.05	0.11	0.18	0.25

The share of Telangana in the total value of the horticultural output at constant prices decreased compared to 2011-12. Though it is very low in 2016-17, started increasing up to 2019-20 and the efforts should be continued to increase the share due to the favourable climatic conditions and the potential in the state. The share of the fruits and vegetables also has shown the same trend.



Table 7: Area (million ha) and production (million tonnes) of the horticultural crops in India in 2022-23 and 2023-24

Crop Group	2022-23				2023-24			
	Area	% to Total	Production	% to Total	Area	% to Total	Production	% to Total
Fruits	7.02	24.70	110.21	31.00	7.13	24.52	112.98	31.85
Vegetables	11.31	39.77	212.55	59.79	11.23	38.62	207.21	58.41
Medicinal and Aromatics	0.75	2.65	0.61	0.17	0.93	3.18	0.73	0.20
Flowers	0.28	1.00	3.10	0.87	0.32	1.09	3.54	1.00
Plantation Crops	4.55	16.00	17.05	4.80	4.46	15.32	17.67	4.98
Spices	4.51	15.88	11.83	3.33	5.02	17.27	12.48	3.52
Total	28.44	100.00	355.48	100.00	29.09	100.00	354.74	100.00

Source: 2023-24 final estimates, Ministry of Agriculture and Farmers Welfare, GoI

During 2023-24, the production of horticultural crops in the country was 354.74 million tonnes from an area of 29.09 million hectares.

Table 8: Comparison of land use among the major horticulture growing states in India 2021-22

State	Area ('000ha)	Production ('000MT)	Cultivable land ('000ha)	% horticultural area in cultivable land
Telangana	471.10	4853.69	6715	7.02
Andhra Pradesh	1671.33	27413.24	8987	18.60
Bihar	1295.76	22961.97	6542	19.81
Gujarat	1880.10	25622.74	12428	15.13
Karnataka	2613.50	22148.27	12836	20.36
Kerala	1579.60	9197.65	2223	71.06
Madhya Pradesh	2391.07	34959.13	17432	13.72
Maharastra	2369.15	30250.30	20466	11.58
Odisha	1481.89	13241.23	6782	21.85
Rajasthan	1664.29	4599.27	25463	6.54
Tamil Nadu	1536.91	20859.44	8105	18.96
Uttar Pradesh	2420.40	41530.12	18264	13.25
West Bengal	1973.82	33195.61	5595	35.28

Source: Agricultural statistics at a glance, 2023, GoI



The percent of horticultural crops in cultivable land is the highest in Kerala followed by West Bengal. There is every need to increase the share under horticultural crops at least to the level of share of horticultural crops in the neighbouring states viz., Karnataka, Tamil Nadu and Andhra Pradesh due the favourable climatic conditions and potential for horticultural crops in the state.

Table 9: Position of Telangana in area ('000ha) of horticulture crop groups in India: 2023-24

Crop	Telangana	India	Percent share to India	Rank	Top three Highest states
Fruits	168.25	7131.08	2.36	15	Maharashtra, Andhra Pradesh, Uttar Pradesh
Vegetables	47.00	11232.19	0.42	23	West Bengal, Uttar Pradesh, Madhya Pradesh
Medicinal and Aromatics	0.23	926.25	0.03	20	Rajasthan, Uttar Pradesh, Madhya Pradesh
Flowers	3.25	316.91	1.03	15	Tamil Nadu, Madhya Pradesh, Karnataka
Plantation crops	1.27	4456.01	0.03	19	Karnataka, Kerala, Tamil Nadu
Spices	175.37	5023.65	3.49	7	Rajasthan, Gujarat, Madhya Pradesh
Total	395.38	29086.09	1.36	19	Karnataka, Madhya Pradesh, Uttar Pradesh

Source: 2023-24 final estimates, Ministry of Agriculture and Farmers Welfare, GoI

Table 10: Position of Telangana in production ('000 tonnes) of horticulture crop groups in India: 2023-24

Crop	Telangana	India	Percent share to India	Rank	Top three Highest states
Fruits	1864.81	112978.02	1.65	15	Andhra Pradesh, Maharashtra, Uttar Pradesh
Vegetables	1076.25	207207.84	0.52	21	Uttar Pradesh, West Bengal, Madhya Pradesh
Medicinal and Aromatics	3.55	726.23	0.49	10	Rajasthan, Madhya Pradesh, Tamil Nadu



Crop	Telangana	India	Percent share to India	Rank	Top three Highest states
Flowers	60.09	3535.31	1.70	13	Tamil Nadu, Madhya Pradesh, Karnataka
Plantation crops	0.26	17666.19	0.001	23	Karnataka, Tamil Nadu, Kerala
Spices	930.75	12483.79	7.46	5	Madhya Pradesh, Gujarat, Andhra Pradesh
Total	3936.74	354743.64	1.11		Uttar Pradesh, Madhya Pradesh, West Bengal

Source: 2023-24 final estimates, Ministry of Agriculture and Farmers Welfare, GoI

Table 11: Position of Telangana in area ('000 ha) of major horticultural crops in India: 2023-24

Crop	Telangana	India	Percent share to India	Rank	Top three Highest states
Fruits					
Mango	124.05	2396.22	5.18	9	Andhra Pradesh, Uttar Pradesh, Odissa
Citrus	29.65	1125.85	2.63	8	Maharashtra, Madhya Pradesh, Andhra Pradesh
Guava	5.77	361.44	1.60	15	Madhya Pradesh, Uttar Pradesh, Andhra Pradesh
Pomegranate	0.88	223.52	0.39	10	Maharashtra, Gujarat, Karnataka
Vegetables					
Green Chilli	3.89	438.71	0.89	15	Madhya Pradesh, West Bengal, Karnataka
Okra/ladyfinger	2.23	557.00	0.40	22	Gujarat, West Bengal, Odissa
Onion	5.02	1540.64	0.33	18	Maharashtra, Madhya Pradesh, Karnataka
Tomato	12.69	853.99	1.49	17	Madhya Pradesh, Odissa, Gujarat
Potato	0.94	2322.23	0.04	22	Uttar Pradesh, West Bengal, Bihar
Flowers					
Marigold	0.82	83.90	0.98	13	Madhya Pradesh, Karnataka, Gujarat



Crop	Telangana	India	Percent share to India	Rank	Top three Highest states
Chrysanthemum	1.19	41.01	2.90	6	Karnataka, Tamil Nadu, Andhra Pradesh
Gerbera	0.03	5.47	0.60	9	Meghalaya, Jharkhand, Nagaland
Rose	0.67	44.55	1.49	11	Uttar Pradesh, Karnataka, Gujarat
Tuberose	0.22	24.98	0.89	8	West Bengal, Tamil Nadu, Andhra Pradesh
Spices					
Turmeric	14.17	292.83	4.84	8	Maharashtra, Odissa, Madhya Pradesh
Ginger	0.78	194.24	0.40	22	Madhya Pradesh, Karnataka, Odissa
Red Chilli	158.83	965.61	16.45	3	Andhra Pradesh, Karnataka, Telangana

Table 12: Position of Telangana in production ('000 tonnes) of major horticultural crops in India: 2023-24

Crop	Telangana	India	Percent share to India	Rank	Top three highest states
Fruits					
Mango	939.23	22398.21	4.19	8	Uttar Pradesh, Andhra Pradesh, Bihar
Citrus	493.28	14552.51	3.39	7	Andhra Pradesh, Madhya Pradesh, Maharashtra,
Guava	91.58	5368.05	1.71	17	Madhya Pradesh Uttar Pradesh, Andhra Pradesh
Pomegranate	11.01	2842.12	0.39	7	Maharashtra, Gujarat, Karnataka
Vegetables					
Green Chilli	65.96	4670.84	1.41	12	Madhya Pradesh, Karnataka, Bihar
Okra/ ladyfinger	43.70	7305.41	0.60	16	Gujarat, Madhya Pradesh, West Bengal



Crop	Telangana	India	Percent share to India	Rank	Top three highest states
Onion	100.39	24266.71	0.41	17	Maharashtra, Madhya Pradesh, Gujarat
Tomato	346.07	21323.22	1.62	16	Madhya Pradesh, Andhra Pradesh, Karnataka
Potato	22.33	57053.34	0.04	23	Uttar Pradesh, West Bengal, Bihar
Flowers					
Marigold	11.90	981.63	1.21	12	Madhya Pradesh, Karnataka, Tamil Nadu
Chrysanthemum	35.86	651.29	5.51	5	Karnataka, Tamil Nadu, Andhra Pradesh
Gerbera	1.68	24.63	6.82	6	Tamil Nadu, Jharkhand, West Bengal
Rose	3.32	501.56	0.66	12	Andhra Pradesh, West Bengal, Uttar Pradesh
Tuberose	4.91	216.05	2.27	6	West Bengal, Tamil Nadu, Andhra Pradesh
Spices					
Turmeric	113.73	1063.22	10.70	3	Maharashtra, Tamil Nadu, Telangana
Ginger	18.81	2333.00	0.81	18	Madhya Pradesh, Odisha, Karnataka's
Red Chilli	794.42	2909.84	27.30	2	Andhra Pradesh, Telangana, Madhya Pradesh

Source: Derived from 2023-24 final estimates, Ministry of Agriculture and Farmers Welfare, GoI



Table 13: Position of Telangana in productivity (t/ha) of major horticultural crops in India: 2023-24

Crop	Telangana	India	Rank
Fruits			
Mango	7.57	9.35	13
Citrus	16.64	12.93	4
Guava	15.88	14.85	7
Pomegranate	12.58	12.72	4
Vegetables			
Green Chilli	16.96	10.65	3
Okra/Ladyfinger	19.58	13.12	2
Onion	20.02	15.75	6
Tomato	27.26	24.97	8
Potato	23.88	24.57	9
Spices			
Turmeric	8.02	3.63	1
Ginger	23.99	12.01	1
Red Chilli (dry)	5	3.01	2

Source: Derived from 2023-24 final estimates, Ministry of Agriculture and Farmers Welfare, GoI



Projected Demand of Horticultural Crops in Telangana

Consumption of Fruits, Vegetables and Spices

Present Consumption of Fruits

During 2023-24, fruits are grown in 4.15 lakh acres with a production of 18.65 lakh metric tonnes. A total of 12 types of fruits are grown out of which surplus production in 3 types of fruits viz., mango, sweet orange, acid lime and deficit production in 9 types of fruits viz., apple, banana, pomegranate, grapes, guava, sapota, pineapple, jamun and musk melon. The per capita consumption of fruits in the state is 99 g per day (as per PJTAU survey, 2017) which is almost at par with the ICMR recommendation of 100 g per day.

Table 14: Present consumption of fruits and vegetables in Telangana

Sl. No	Particulars	Consumption per person(g) per day		
		Recommendations by ICMR	Actuals as per PJTAU Survey	Deficit
1	Tuber crops	100	27	73
2	Leafy vegetables	100	24	76
3	Other Vegetables	200	199	1
4	Total Vegetables	400	250	150
5	Fruits	100	99	1



Present Consumption of Vegetables

Area under vegetables is 1.13 lakh acres with a production of 11.17 lakh metric tonnes (2023-24). Major vegetable crops grown in Telangana state are tomato, onion, okra, brinjal, green chilli, gourds, leafy vegetables and beans. More than 30 varieties of vegetables are being consumed in Telangana. As per PJTAU survey, the per capita consumption of vegetables (including onion) is 250 g per day, as against ICMR recommendation of 400 g per day. It is seen that 150 g less vegetables are consumed against recommended quantities and the deficit is more in leafy vegetables and tuber crops.

As per PJTAU survey the per capita consumption of fruits and vegetables in the state is 3.0 kg and 7.5 kg per month respectively against the recommended quantities of 3.0 kg and 12.0 kg respectively showing that the consumption of the fruits and vegetables is very less.

Present Consumption of Spices

Spices are grown in 4.33 lakh acres with a production of 9.31 lakh metric tonnes. Major spice crops grown in the state are red chilli, turmeric and ginger. Telangana is one of the major spices consuming state in the country with an average monthly consumption of 636 grams.

Projected Demand of Fruits and Vegetables

Fruits and vegetables account for an amount of Rs 182 (8%) and Rs. 277 (13%) respectively of the food and groceries consumption of the Telangana households as per study conducted by ICAR – NAARM and PJTAU. Now majority of the fruits and vegetable are consumed in primary form. The demand for fruits and vegetables is estimated for 2025, 2030 and 2035 based on population growth.

(Source: <https://statisticstimes.com/demographics/india/telangana-population.php>).



Demand for Fruits

Demand for fruits is calculated based on ICMR recommendation of 100g/day (As per PJTAU @ 99 g/day). In addition to the domestic consumption, Telangana state is exporting fruits particularly mango to other states and to overseas markets though very little quantities. The crop is having good potential for export and also has good potential for processing. There is demand for the other fruit crops also particularly after the COVID 19 incidence. Demand for food is usually determined taking into consideration of growth and income of the economy, demographical features like increase in population, urbanization and changing food habits of the population. There will be post-harvest losses in fruits at different stages viz., harvesting, handling, packing, transportation, storage and marketing. These losses may be at different levels from producer-wholesaler-retailer-consumer level. In view of changing life styles, the processing is likely to increase in future at least by 10 percent. An attempt has been made to assess the demand of fruits for the years 2025, 2030 and 2035 based on the allowance of 30 percent towards exports, 5 percent for processing and 30 percent towards post-harvest losses.

Table 15: Projected demand for fruits (Lakh metric tonnes per annum)

Year	Consumption Demand	Export	Processing	Post harvest losses	Total	Production 2023-24	Deficit
2025	14.05	4.215	0.7025	4.215	23.18	18.65	4.53
2030	14.28	4.284	0.714	4.284	23.56	18.65	4.91
2035	14.39	4.317	0.7195	4.317	23.74	18.65	5.09

Projected Demand for Vegetables

The demand for vegetables is calculated based on present consumption (As per PJTAU @ 250 g/day) and ICMR recommendations (400g/day). An attempt has been made to assess the demand of vegetables for the years 2025, 2030 and 2035 based on the allowance of 5 percent towards exports, 10 percent for processing and 30 percent towards post-harvest losses.



**Table 16: Projected consumption demand for vegetables
as per ICMR recommendations (Lakh metric tonnes)**

	2025	2030	2035
Consumption Demand			
Leafy vegetables	14.05	14.28	14.39
Tuber crops	14.05	14.28	14.39
Other vegetables	28.10	28.56	28.78
Total	56.21	57.12	57.56
Post harvest losses			
Leafy vegetables	4.22	4.28	4.32
Tuber crops	4.22	4.28	4.32
Other vegetables	8.43	8.57	8.63
Total	16.87	17.13	17.27
Processing			
Leafy vegetables	1.41	1.43	1.44
Tuber crops	1.41	1.43	1.44
Other vegetables	2.81	2.86	2.88
Total	5.63	5.72	5.76
Export			
Leafy vegetables	0.70	0.71	0.72
Tuber crops	0.70	0.71	0.72
Other vegetables	1.41	1.43	1.44
Total	2.81	2.85	2.88
Total considering the allowances			
Leafy vegetables	20.37	20.71	20.87
Tuber crops	20.37	20.71	20.87
Other vegetables	40.75	41.41	41.73
Total	81.49	82.83	83.47



**Table 17: Projected consumption demand for vegetables
as per actual consumption (Lakh metric tonnes)**

	2025	2030	2035
Consumption Demand			
Leafy vegetables	3.37	3.43	3.45
Tuber crops	3.79	3.86	3.89
Other vegetables	27.96	28.42	28.64
Total	35.13	35.70	35.98
Post harvest losses			
Leafy vegetables	1.01	1.03	1.04
Tuber crops	1.14	1.16	1.17
Other vegetables	8.39	8.52	8.59
Total	10.54	10.71	10.79
Processing			
Leafy vegetables	0.34	0.34	0.35
Tuber crops	0.38	0.39	0.39
Other vegetables	2.80	2.84	2.86
Total	3.51	3.57	3.60
Export			
Leafy vegetables	0.17	0.17	0.17
Tuber crops	0.19	0.19	0.19
Other vegetables	1.40	1.42	1.43
Total	1.76	1.78	1.79
Total considering the allowances			
Leafy vegetables	4.89	4.97	5.01
Tuber crops	5.50	5.59	5.63
Other vegetables	40.55	41.20	41.53
Total	50.94	51.76	52.17



Table 18: Deficit in production as against demand projections as per ICMR recommendations (Lakh metric tonnes)

	Consumption Demand			Total Demand			Production (2023-24)	Deficit as per consumption demand			Deficit as per total demand		
	2025	2030	2035	2025	2030	2035		2025	2030	2035	2025	2030	2035
Leafy vegetables	14.05	14.28	14.39	20.37	20.71	20.87	0.97	13.08	13.31	13.42	19.4	19.74	19.9
Tuber crops	14.05	14.28	14.39	20.37	20.71	20.87	1.40	12.65	12.88	12.99	18.97	19.31	19.47
Other vegetables	28.10	28.56	28.78	40.75	41.41	41.73	8.80	19.3	19.76	19.98	31.95	32.61	32.93
Total	56.20	57.12	57.56	81.49	82.83	83.47	11.17	45.03	45.95	46.39	70.32	71.65	72.29

Table 19: Deficit in production as against demand projections as per present consumption (Lakh metric tonnes)

	Consumption Demand			Total Demand			Production (2023-24)	Deficit as per consumption demand			Deficit as per total demand		
	2025	2030	2035	2025	2030	2035		2025	2030	2035	2025	2030	2035
Leafy vegetables	3.37	3.43	3.45	4.89	4.97	5.01	0.97	2.40	2.46	2.48	3.92	4.00	4.04
Tuber crops	3.79	3.86	3.89	5.50	5.59	5.63	1.40	2.39	2.46	2.49	4.1	4.19	4.23
Other vegetables	27.96	28.42	28.64	40.55	41.20	41.53	8.80	19.16	19.62	19.84	31.75	32.4	32.73
Total	35.13	35.70	35.98	50.94	51.76	52.17	11.17	23.96	24.53	24.81	39.77	40.59	41.00



Projected Demand for Spices

The state is the major consumer of spices with 635 g per month out of which ginger, tamarind and dry chilli account for 23,22 and 15 percent respectively. As per the present consumption level, the projected demand for major spices is given below.

**Table 20: Projected consumption demand for spices
as per actual consumption ('000 metric tonnes) in processed form**

	Ginger	Turmeric	Dry chilli	Tamarind	Garlic	Total
2025	67.55	23.59	45.49	65.29	39.31	293.36
2030	68.64	23.97	46.22	66.34	39.94	298.10
2035	69.18	24.16	46.58	66.86	40.25	300.44

**Table 21: Projected consumption demand for spices
as per actual consumption ('000 metric tonnes) in raw form**

	Ginger	Turmeric	Dry chilli	Tamarind	Garlic
2025	67.55	104.84	45.49	97.93	39.31
2030	68.64	106.53	46.22	99.51	39.94
2035	69.18	107.37	46.58	100.30	40.25

**Table 22: Projected deficit for spices
as per actual consumption ('000 metric tonnes) as raw form**

	Ginger	Turmeric	Dry chilli	Tamarind	Garlic
2025	67.55	104.84	45.49	97.93	39.31
2030	68.64	106.53	46.22	99.51	39.94
2035	69.18	107.37	46.58	100.30	40.25
Production (2023-24)	18.81	113.73	794.42		0.06



Projected Demand for Plantation Crops

Plantation crops include cashew nut, areca nut, cocoa, coconut, coffee, oil palm, date palm, palmyra, rubber, coffee and tea. The climate conditions of Telangana is not congenial to realise full potential productivity of areca nut, coconut, rubber, coffee and tea. Oil palm cultivation has potential in few districts. Palmyra is mostly grown as border crop. Some districts are suitable for date palm and cashew.

Projected Demand for Flowers

Telangana stands at 13th position in flower production in India. In the state flowers are cultivated in open as well as polyhouses. Open area cultivation is in 7886 acres in the state, with a production of 56,885 metric tonnes. Polyhouse cultivation is also done for some exotic flowers in 148.0 acres, with a production of 559 tonnes of cut flowers. Important flower crops cultivated in open cultivation are, marigold, chrysanthemum, crossandra, jasmine and tuberose. Gerbera, rose, carnation, chrysanthemum, gladiolus and asiatic lily are cultivated in polyhouses. Demand for cut flowers is increasing with in the state and also for export. As the climatic conditions of the state are suitable for flower cultivation and has good facilities for export, there is good potential for expansion of flower crops in the state.

Projected Demand for Medicinal and Aromatic Plants

During 2023-24, medicinal plants are grown in an area of 341 acres with a production of 2,099 metric tonnes and aromatic plants are grown in 236 acres with a production of 1447 metric tonnes in the state. Major medicinal and aromatic crops grown in the state are aloe vera, ashwagandha, lemongrass, palmarosa, tulasi. The soil and climatic conditions prevailing in the state favours the cultivation of medicinal and aromatic plants. The demand for medicinal and aromatic plants is increasing since the post-covid condition and the state also witnessed increase in the area under medicinal and aromatic plants particularly in Warangal, Mahabubnagar, Khammam Ranga Reddy and Nalgonda districts. Entrepreneurs are interested in taking up extraction units and commercialisation. There is huge potential for expansion of area under medicinal and aromatic plants in the state.



Challenges and Crop Wise Constraints

In India horticulture sector is more profitable and productive than the agricultural sector and has emerged as a rapidly growing sector. The productivity of horticulture has increased significantly from 8.8 tonnes per hectare in 2001-02 to 12.1 tonnes in 2020-21. Total horticulture production in 2020-21 was around 341.63 million tonnes, with fruit production at around 107.10 million tonnes and vegetable production at around 204.61 million tonnes. India is currently producing about 320.48 million tonnes of horticulture produce which has surpassed the food grain production, that too from much less area (25.66 M. ha. for horticulture against 127.6 M. ha. for food grains). Productivity of horticulture crops is much higher compared to productivity of food grains (12.49 tones/ha against 2.23 tones/ha.). India contributes about 10 and 13.4 percent of fruits and vegetables in the world. India is the largest producer of mango and banana in the world producing 65 and 11 percent of mango and banana of the world. India is the largest producer of cauliflower in the world. India is second in onion production and third in cabbage production in the world. India's varied climate is suitable for the cultivation of more than 30 fruit trees and 40 vegetables. However, the sector faces many challenges. Global trade is very low accounting for only 1 percent of the global trade in fruits and vegetables. In Telangana also the horticulture sector has shown good growth in production. However, the sector still faces many challenges.

Increasing population and standard of living cause increased demand for food with significant increase in demand for the high value and quality products like fruits and vegetables. There is also increasing consciousness about quality of the produce both at national level and global levels. Hence, there is need to increase the production with good quality from the available land and other resources. Climate change and degrading natural resources are to be considered in increasing production to meet the demand. More concern is to be given to sustainable horticulture adapting climate change mitigation strategies.



Increasing productivity of the resources viz., per unit of land, water and other inputs.

1. **Production constraints:** Non profitable due to high cost of production, non-availability of quality seedlings in time, biotic and abiotic stresses, scarcity of labour during critical stages, non-availability of skilled labour, high wage rates, lack of proper machinery, crop insurance, late disbursement of loans, unsustainable income, non-integration with agriculture and livestock.
2. **Marketing constraints:** Lack of marketing facilities at local place, high transportation costs, price fluctuations, involvement of middlemen, market intelligence, grading, cold storage and processing facilities
3. Low returns per unit area
4. Management and sustaining natural resources like land, soil, water and biodiversity in the context of changing climate

Crop Wise Constraints

Fruits

Mango

Mango is the important fruit crop in the state occupying 73 percent of area and 50 percent of the production of fruit crops. Varieties grown in the state are Benishan/ Banganpalli, Dashehari, Totapuri, Himayath, Chinnarasam and Pedddarasam. The state ranks 9th in area and 8th in production in India accounting for 5.18 and 4.19 percent in the country's area and production (2023-24). The state ranks 13th in productivity and the state's productivity is lower than the national average. Only 30-35 percent of the produce is consumed in the state and rest is exported to other states in the country in the months of April, May and June.

The constraints in the mango cultivation in the state include

- Low productivity
- Old and unproductive orchards
- Old orchards with traditional varieties, not preferred in the European & US Markets



- Poor management practices
- Absentee landlordism
- Malformation
- Irregular flowering
- Biotic stresses: extreme weather (Rains during flowering and May)
- Abiotic stresses: Powdery mildew and mango hoppers
- Pre-harvest sale of crop to contractors
- Inadequate quality planting material
- Lack of pedigree and certified planting material
- Low processing
- Poor storage facilities including cold storage

Sweet orange

Sweet orange is another important fruit crop in the state occupying 14 percent in area and 21 percent in the production of fruit crops. Telangana occupies third position in area and production of sweet orange in India with number two position in productivity next to Andhra Pradesh (2020-21). The crop is marketed as fresh fruit. The produce is mostly consumed in the state itself and some produce is exported to the other states in the country.

The major constraints in the crop:

- Glut in the market as all the produce come from November to March
- Poor marketing facilities
- High commission and margin to the traders due to lack of regulated markets
- Poor processing facilities
- Poor management of orchards
- Uncertified planting materials
- Lack of virus free budding material and budding on Jamberi root stock instead of Rangapur lime
- Calcareous soils
- Micronutrient deficiencies
- Dry root rot and die back disease



Guava

Guava is an important fruit crop in the state occupying 5.01 percent of fruit crop area and contributing 4.91 percent of fruits production. The state ranks 15th in area and 17th in production and 7th in productivity. Though the state productivity is higher than the national average, there is potential to attain the highest productivity of 26 t/ha in the country. However, the demand in the months of October- December is not being met from the present production. Consumers preference is changing and they prefer different varieties like less seed, good size, red flesh etc., which need to be considered in area expansion and management of the orchards.

Crop	Constraints
Pomegranate	Bacterial nodal blight Wilt in heavy soils
Banana	Irrigation management Bunchy top virus Fusarium wilt Blackening of spots on fruits Post harvest losses
Grape	Soil and water salinity Rains during flowering Downy mildew, powdery mildew Thrips and mealy bug
Papaya	Varietal susceptibility Ring spot virus Mealy bug Post harvest losses Poor marketing and transport
Custard apple	Stone fruits Mealybug Nematodes
Avocado	Non availability of suitable varieties



Vegetables

- Round the year crop calendar not followed
- Seed availability
- Glut in the market and price fluctuations
- Deficit in cities and excess in rural areas
- Long distance to markets
- Storage particularly for onion
- Transport
- Poor marketing and dominance of middlemen and agents
- High post-harvest losses
- Poor and low processing

Crop Specific Biotic and Abiotic Constraints

Vegetable	Biotic	Abiotic
Tomato	Sucking pests, Borers, Virus & Phytophthora blight Fruit borer root-knot nematode	High temperature High rainfall
Bhendi (okra)	Sucking pests & YVMV	Low temperature High rainfall
Brinjal	Fruit and Shoot Borer & Little leaf	High temperature High rainfall
Cabbage and Cauliflower	Diamond Back Moth	High temperatures
Green Chilli and capsicum	Sucking pests and Leaf curl Virus Powdery mildew	High summer temperatures for green chilli production
Carrot and Beetroot	Rust fly, Anthracnose	High temperatures
Onion	Thrips and Purple Blotch	High rainfall
Bitter gourd Ridge gourd Bottle gourd Cucumber	Fruit fly Powdery and downy mildew virus	Low temperatures in winter
Colocasia	Phytophthora Blight	
Coccinia	Fruit fly and leaf miner	High rainfall Low temperatures



Plantation Crops

Oil Palm

- Non availability of quality seed sprouts
- Drought
- Inadequate pollination
- Package for suitable intercrops
- Ganoderma root rot
- Rhinoceros beetle in early stages

Spices

Red Chilli

- Black thrips
- Fungal wilt
- Choanephora twig blight
- Anthracnose & fruit rot
- Viral diseases
- Quality
- High pesticides application
- Post harvest losses, Aflatoxins
- Pesticide residues
- Rotting in Chapata chilli
- Nutritional disorders

Ginger

- Needs the specific climate and soil, weed management, mulching, late harvesting
- High seed rate and high cost of cultivation
- Non availability of pure seed material at reasonable price
- Rhizome rot, Bacterial wilt and soft rot
- Processing and value addition: ginger powder



Turmeric

India is the leading producer of turmeric in the world. It attained the position of geographical indicator of India.

- Lack of suitable improved varieties with high curcumin content
- Long duration crop (8 to 9 months)
- Pests and diseases
- Labour availability
- High cost of cultivation
- Not going for intercrops
- Mechanization
- Inadequate storage facility
- Poor post-harvest management
- High cost of processing (Boiling, drying and polishing)
- Price fluctuations
- Constraints in export
- Leaf spot, soft rot

Flower Crops

Powdery mildew in rose, aphids in chrysanthemum, fusarium wilt in carnation

To address these abiotic and biotic constraints, need to take the technology backup from the horticultural university in the state for the available solutions/technologies and need to initiate/intensify research on the other constraints.



Technology Back-up for Horticulture Sector – Sri Konda Laxman Telangana Horticultural University

Introduction

Sri Konda Laxman Telangana State Horticultural University (SKLTSHU) was established on 23.12.2014 (Andhra Pradesh Reorganization Act No. 6 of 2014 and G.O. Ms. No. 31 & 32) by carving out the Colleges, Research Stations and KVK located within the territorial boundaries of Telangana State from the erstwhile Dr. Y.S.R. Horticultural University. The university adopted Dr. Y.S.R. Horticultural University Act, 2007 (Act No. 30 of 2007) with certain modifications. Initially headquartered at Rajendranagar, Hyderabad, the University was later shifted to Mulugu in Siddipet district. During 2024, the Telangana government issued a gazette notification officially renaming the university to Sri Konda Laxman Telangana Horticultural University (SKLTGHU).

The University, named in honour of Sri Konda Laxman Bapuji, a veteran freedom fighter and Telangana protagonist. It is the only horticultural university in the state catering to the needs of the farming community. The University runs on the land grant pattern with emphasis on teaching, research and extension of horticulture and allied subjects.

Mandate

The University has the primary mandate of teaching, research and extension in horticulture.

- 1. Teaching:** Train the manpower by providing education in horticulture and allied subjects for the development of quality human resources
- 2. Research:** Conduct basic, location-specific and need-based research focusing on strategic and anticipatory studies in horticultural crops
- 3. Extension:** Facilitate the transfer of technology through frontline extension



The University comprises of

- Colleges of Horticulture – 3
- Post Graduate Institute for Horticultural Sciences – 1
- Horticultural Polytechnic Colleges – 3 and one affiliated
- Research Stations – 10
- Krishi Vigyan Kendra – 1
- Forest College and Research Institute – (Affiliated)

Activities

Teaching

Undergraduate and Postgraduate programmes:

The University offers B.Sc. (Hons) Horticulture; M.Sc. (Horticulture) and Ph.D. (Horticulture) programmes. The PG programme is offered in four disciplines viz., (i) Floriculture and Landscaping (ii) Fruit Science (iii) Plantation, Spices, Medicinal and Aromatic crops (iv) Vegetable Science.

Colleges and Institutes under SKLTGHU

Sr. No	Name of the College/Institute	Year of establishment	Academic programmes
Constituent Colleges			
1	College of Horticulture, Rajendranagar, Hyderabad	2007	B.Sc. (Hons.) Horticulture
2	College of Horticulture, Mojerla, Wanaparthy District	2007	B.Sc. (Hons.) Horticulture
3	College of Horticulture, Malyal, Mahabubabad District	2023	B.Sc. (Hons.) Horticulture
4	Post Graduate Institute for Horticultural Sciences, Mulugu, Siddipet District	2022	M.Sc. & Ph.D. Horticulture
Affiliated College			
1	Forest College and Research Institute (FCRI), Mulugu, Siddipet District	2016	B.Sc. (Hons.) Forestry M.Sc. & Ph.D. Forestry



The annual intake

- SKLTGHU - 360 in B.Sc. (Hons.) Horticulture, 42 in M.Sc. Horticulture and 9 in Ph.D. Horticulture including special category seats, EWS and ICAR quota.
- Forest College Research Institute (FCRI) - B.Sc (Hons.) Forestry is 65, M.Sc. Forestry is 36 and 18 in Ph.D. Forestry.
- The University has introduced NRI/ NRI Sponsored seats, 6 in Undergraduate, 4 each in Post-graduate and Doctoral programmes of Horticulture.

Indian Council of Agricultural Research (ICAR), New Delhi has accredited university and colleges for a period of 5 years from 28th March 2021 to 27th March 2026

Central Instrumentation Facility

A state-of-the-art laboratory established at University campus aims to support both horticulture researchers and farmers in the areas of food quality, irrigation water quality, soil fertility and plant nutrition. This lab has unique integration of leaf analysis with water and soil analysis. This comprehensive approach enables the lab to provide facilities to conduct quality research and holistic recommendations to the farmers for attaining sustainable crop yields and quality.





Research and Instructional Farm

Research and Instructional farm is being developed in an area of 80 acres at Kotiyal village, near Mulugu campus for conducting research by post graduate students.



Horticulture Diploma Programme

The University has three constituent Horticulture Polytechnic (HPT) colleges and one affiliated Horticulture Polytechnic with a total intake of 160. Duration of course is 2 years with medium of instruction in English.

Horticulture Polytechnics under SKLTGHU

Sl. No	Name of the Polytechnic and Location	Year
Constituent Polytechnics		
1	Horticulture Polytechnic (HPT) Adilabad, Adilabad District	2003
2	Horticulture Polytechnic (HPT), Ramagirikhilla, Peddapalli District	2008
3	Horticulture Polytechnic (HPT), Kollapur, Nagarkurnool District	2023
Affiliated Polytechnic		
1	Ghanta Gopal Reddy Horticulture Polytechnic, Gaddipally, Suryapet District	2022



Research

To address location specific problems in different regions of the state, research programmes are conducted in 10 Horticultural Research Stations covering three Agro Climatic zones. Research is being carried out through multi - disciplinary approach to address the issues like nutritional security, productivity and income enhancement, cost reduction, efficient utilization of resources, profitability, sustainability and overall improvement in the standard of living of the farming community.

Agro Climatic Zone-wise Research Stations under SKLTGHU

S. No.	Research station	Mandate
Northern Telangana		
1	Turmeric Research Station, Kammarpally, Nizamabad District	Turmeric and ginger
2	Horticultural Research Station, Adilabad, Adilabad District	Jamun, minor fruits, beans, aromatic plants (Lemon grass, citronella and palma rosa)
Central Telangana		
3	Horticultural Research Station, Konda Mallepally, Nalgonda District	Sweet orange, acid lime, ber and palmyrah
4	Horticultural Research Station, Aswaraopet, Bhadrachalam District	Banana, papaya, oilpalm, cashew nut, coconut and betelvine and vegetables
5	Horticultural Research Station, Malyal, Mahabubabad District	Chilli, paprika, mango, karonda and jackfruit
6	Fruit Research Station, Sangareddy, Sangareddy District	Mango, guava, seethaphal, sapota, jamun and dragon fruit
Southern Telangana		
7	Vegetable Research Station, Rajendranagar, Hyderabad	Tomato, brinjal, green chilli, okra, dolichos bean, bottle gourd, ridge gourd, bitter gourd, cooking melon, colocasia and sweet potato
8	Floricultural Research Station, Rajendranagar, Hyderabad	Marigold, chrysanthemum, tuberose, jasmine and rose
9	Grape Research Station, Rajendranagar, Hyderabad	Grapes
10	Medicinal and Aromatic Plants Research Station, Rajendranagar, Hyderabad	Medicinal and Aromatic Plants



All India Coordinated Research Projects (AICRP) Centres:

1. AICRP on Fruits (Mango & Guava), Fruit Research Station, Sangareddy, Sangareddy District.
2. AICRP on Citrus fruits, Horticultural Research Station, Konda Malleshpally, Nalgonda District.
3. AICRP on Spices (Turmeric & Ginger), Turmeric Research Station, Kammarpally, Nizamabad District.
4. AICRP on Vegetable Crops, Vegetable Research Station, Rajendranagar, Hyderabad.
5. AICRP on Tuber crops (Other than potato), Vegetable Research Station, Rajendranagar, Hyderabad.
6. AICRP on Floriculture, Floricultural Research Station, Rajendranagar, Hyderabad.

Voluntary Centres

1. AICRP on Palms (Palmyrah), Horticultural Research Station, Konda Malleshpally, Nalgonda District.
2. AINRP on Onion and Garlic, Vegetable Research Station, Rajendranagar, Hyderabad.

Extension

The university disseminates horticultural technical "know-how" and "do-how" through front line extension to farmers, Department of Horticulture and other stakeholders by Krishi Vigyan Kendra, Ramagirikhill, Peddapalli district and Research Stations. The university has strong linkage with the line departments and involves in capacity building programmes. Proven technologies and improved varieties are being popularized through All India Radio, print and electronic media, exhibitions, krishi melas. University scientists are actively involved in joint diagnostic visits with horticulture department for identifying the problems and giving advisories to the farmers on real time basis.



Salient Achievements

Academics

- Developed smart classrooms for blended learning
- Conducted four convocations and conferred 1656 degrees to UG and PG students till date
- In addition to university gold medal, 10 sponsored gold medals are being awarded for student academic excellence
- 26 students have secured admission in national institutes (IARI, NIAM, MANAGE, IIM) for higher education in horticulture and management courses
- 127 students have secured seats in other SAUs for higher education in horticulture and allied fields through ICAR entrance examinations
- 48 students were admitted in to Masters programme in Horticulture and other disciplines at universities in USA, UK, Thailand and Germany
- Under Overseas Fellowship programme of Govt. Of Telangana, four undergraduate students of the University are pursuing MS program in horticulture at Auburn University, Alabama, USA with 100% financial support (Rs. 55.00 lakh per student) for a period of two years
- 20 students have become as entrepreneurs in various industries such as arty culture, AUTOCAD design, landscaping, rearing of silkworms and poultry.
- University has organized National Conference of Vice Chancellors of Agricultural Universities sponsored by Indian Council of Agricultural Research (ICAR), New Delhi for implementation of NEP and Sixth Dean's Committee recommendations in the year 2022 & 2024
- University has conducted four Inter Collegiate Games, Sports, Cultural & Literary Meet and first Inter Collegiate Horticulture Polytechnic Games, Sports, Cultural & Literary Meet
- As part of Green Initiative- 525 KW Grid connected rooftop solar PV Power plants at ten locations of University



Research

Germplasm and Varieties

- The University is maintaining rich germplasm (1860) in various horticulture crops viz., fruits (699 no.), vegetables (498 no.), flower & ornamental crops (245 no.), medicinal & aromatic crops (64 no.) and turmeric (317 no.) and other crops (37)
- Grape varieties viz., ARI 516 (juicy variety), Manjari Medika (Teinturier Juice variety) and Manjari Shyama (coloured table variety) were released for Telangana and notified by CVRC



ARI 516



Manjari Medika



Manjari Shyama

- Cultivars such as Mango-Dashehari-35, Guava-SRD-1, Gladiolus-ACC-7 were found suitable for Telangana state



Dashehari-35



SRD-1



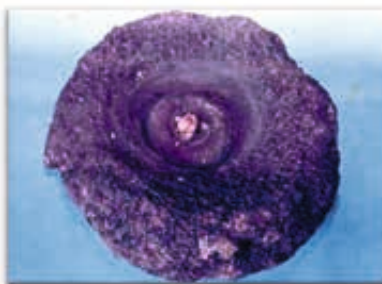
ACC-7



- University released vegetable varieties popular with the farmers viz., Bhagyamati, Gulabi and Shyamala in brinjal, Samrat and Kiran in sweet potato, Gajendra in elephant foot yam, RNSM-1 and 3 in cooking melon, Shakti in ash gourd, RNCA-1 in Colocasia, RNA-1 in amaranthus and Swetha in snake gourd



Bhagyamati



**Elephant foot yam-
Gajendra**



RNSM-3

- University facilitated in getting Geographical Indication (GI) for Warangal Chapata chilli which is majorly used for the extraction of colour and oleoresin



Warangal Chapata



- Initiated the process of Geographical Indication (GI) for Custard apple var. Balanagar, and turmeric var, Armoor



- Initiated research on New Crops- dragon fruit, avocado, spine gourd and oil palm
- Supplying more than 5.0 lakh good quality, true to type planting material of various horticultural crops every year to the farmers

Technologies Developed

Production Technologies

- Fertigation technology for mango, guava, banana, grapes, cabbage, lettuce, broccoli, chilli, chrysanthemum, tuberose, china aster
- Fertilizer scheduling for high density planting in mango
- Standardized stage wise micro irrigation schedules in grapes



**Fertigation in High Density Planting-
Guava**



Fertigation in Lettuce



- Mulching and irrigation schedules in chilli and turmeric



Mulching in Chilli



Mulching in Turmeric

- Standardized the harvesting stages for higher herbage yield and oil in citronella, lemon grass and palmarosa
- Developed package of practices for organic production of mango, guava, turmeric and ginger
- Standardized rapid multiplication of turmeric using protray nursery method: Less planting material requirement (300-400 kg per acre), Saving in seed cost (Rs. 10,000/acre), Disease free planting material, 98 – 100 percent field establishment, High cost: benefit ratio, suitable for high production technology suitable for early/delayed planting



Protray Nursery Method of Turmeric Multiplication



Protection Technologies

- IPM modules for tomato pinworm and shoot and fruit borer in brinjal
- Modules for management of sucking pests and yellowing in bitter melon
- Modules for management of mealy bugs in custard apple
- Management of rhizome rot in turmeric - Priming of turmeric and ginger seed rhizomes with Trichoprime before 2 to 4 weeks of sowing, enhances germination, vigour and suppress rhizome rot

Post Harvest and Value Addition

- Low Cost Technology for Ripening of Mango: Developed prototype ripening chamber with ethylene gas cylinders for ripening of mangoes without use of harmful chemicals such as Calcium Carbide. The Cost of ripening of 1 kg mango costs around 50 paise.
- Mango-Irradiation for export: Irradiation of Dashehari fruit at 0.6 kGy increases the shelf life
- Suitable lining materials for different packaging conditions of tuberose flowers
- Preservation technology for roses (Life like roses): The rose flowers dried with alcohol+2 % citric acid+20% Glycerine and dye application with 2% food colour preserved for 7 months.
- Value added products in flowers: Rose Gulakand, Lipbalm, Incense Sticks, Car air fresheners
- Dry flower technology: Using indigenous flowers of Telangana and other natural materials prepared various tabletop decorative items, customized photo frames, key chains, seasons greetings, women adornments for commercial sale



Dry flower bouquet, memento and pen stand



Farm Machinery

- Mechanization in rejuvenated mango orchard: Tractor mounted vertical blades for mechanized pruning in rejuvenated mango orchards



Mechanized Pruner in Mango

- Mechanization in turmeric cultivation: Complete end to end mechanization in Turmeric cultivation





Pedal operated turmeric digger

Developed as alternative to traditional turmeric manual digger. Normally turmeric rhizomes can be harvested by using konki or crow bar and farmers need to bent down while digging. This improved pedal operated turmeric digger avails the farmer to dig the turmeric with legs and farmer don't need to bent in the field. It is very easy to dig the turmeric and damage of rhizomes during harvesting is also very low in this method.



Low cost mini turmeric boiler

Developed for the marginal farmers where turmeric is cultivated in small holdings, hills and forest areas. Traditional boilers are costly and more labour for running the boiler. This boiler suitable for boiling small batch of turmeric without losing curcumin and oleoresin from turmeric. Boiler capacity is 45-50 kg/batch, and it takes 15-20 minutes for boiling. The machine cost is Rs. 35000/- per unit.





Mini Turmeric polisher

2 to 5 kg dried turmeric rhizomes can be polished in manual method. It is also developed for the marginal farmers where turmeric is cultivated in small holdings, hills and forest areas.



Extension

- Publishes “Udyana Darshini” a handbook with detailed package of practices in horticultural crops every year in Telugu
- Large-scale awareness and demonstration programmes on the management of black thrips were conducted, which significantly contributed to the effective control of black thrips in chilli crop across Telangana State in 2024
- Skill-based training to rural youth on millet value addition, organic vegetable cultivation, vermicomposting, protected cultivation and chili processing
- Established Custom Hiring Center in adopted villages
- Short term Certification training programmes in Kitchen gardening, Landscape Maintenance, Dry Flower Technology, Fruit nursery establishment and management of Oil Palm Orchards
- Exhibitions depicting university technologies



- TV and Radio Programmes
- Whatsapp groups were created for mango and vegetable growers for sharing of technical expertise
- Agro Advisories were provided in horticultural crops at regular intervals



- Field and diagnostic visits at least once in a month by the scientists of the research stations and on regular basis in KVK



Diagnostic visits

- Field days-Mango, grapes, chilli and flower crops for demonstration and popularisation of university technologies



- Interactive meetings with farmers, industry and entrepreneurs





Thrust Areas of Research and Extension

- Development of high yielding varieties/ hybrid in fruits, vegetables, flowers, spices, medicinal and aromatic plants suitable for Telangana climate.
- Development of production and protection technologies for optimum and efficient resource use
- Bridging the yield gap and decrease the cultivation cost through adoption of available technologies
- Production of quality planting material
- Farm mechanization
- Integrated farming systems
- Integration of horticulture crops with agricultural crops
- Value addition and processing for horticultural crops
- Emphasis on climate resilient varieties and technologies
- Encourage protected cultivation (shade net houses / poly houses) to overcome seasonal barriers and make Vegetables and Flowers available round the year.
- Crop modelling, weather based Agro advisories
- Establishment of Centers of Excellences (COEs) for vegetables, flowers & fruits to impart training to the poly house farmers and production of high quality and disease-free seedlings of vegetables and plant material of various fruit crops.
- Application of GIS, Drone and AI technologies
- Capacity building



Vision, Potential and Strategies: Crop-wise

Based on the primary and secondary data and the analysis, perspective plan for Telangana is developed. In addition to the secondary and primary data, views of the experts from scientific community of universities and ICAR institutes, department of horticulture, department of marketing, Telangana State Seed and Organic Certification Authority, APEDA, industry, farmers, cooperatives, FPOs, exporters and NGOs were taken by conducting series of meetings and incorporated in the plan. Proceedings of the some of the meetings are enclosed:

1. Meeting with farmers associations on 9.1.2025: Participants-Chairman and members of Telangana Agriculture and farmers Welfare Commission, Chairman, Telangana Seeds Development Corporation.
2. Buyers and sellers meet on mango on 24.4.2025: Participants- officials from APEDA, exporters.
3. Expert group meeting on Perspective Plan for the Development of Horticulture in Telangana 2035 on 03.02.2025: Participants –Eminent scientists, Ex vice chancellors of horticultural university.
4. Expert group meeting with REC members on 28.2.2025: Participants – scientists, farmers, input industry, Department of horticulture, Department of marketing, APEDA, Telangana State Seed and Organic Certification Authority.
5. Expert group meeting with FPOs and Industries on 9.5.2025: Participants – Representatives from Coopratives, FPOs, processing and other industries





In consultation with the officials of the department of horticulture, Govt of Telangana potential districts for area expansion in the next ten years were identified and categorised as high and medium potential based on the potential for area expansion.

Potential Area Expansion of Horticultural Crops in Telangana

Sr. No	District	Existing area under horticultural crops (acres)	Gross cropped area (acres) 2022-23	Potential area Expansion (acres) (Next ten years 2035)	Potential area Expansion (acres) (Next five years 2030)	Potential
1	Khammam	201853.21	1023300	104834	35000	H
2	Bhadradri Kothagudem	147701.39	507273	66465	35000	H
3	Mahabubabad	96689.24	547093	275150	35000	H
4	Jogulamba Gawal	92477.65	562845	112723	35000	H
5	Nalgonda	79796.76	1807518	108497	35000	H
6	Rangareddy	71615.74	543203	79905	15000	M
7	Nagarkurnool	59177.42	861318	20120	10000	M
8	Jagtial	53482.54	767898	72200	35000	H
9	Suryapet	41149.06	1112563	66750	35000	H
10	Siddipet	38651.47	974820	47701	35000	H
11	Vikarabad	33848.38	752240	14852	8000	M
12	Nizamabad	30824.98	1027550	15450	10000	M
13	Sangareddy	31308.74	937295	11049	5000	M
14	Warangal	30353.42	504795	25227	25000	H
15	Jayashankar Bhupalpalli	29533.08	330195	36245	35000	H
16	Mulugu	29165.55	206068	31981	15000	M
17	Wanaparthy	47419.75	484855	237101	15000	M



Sr. No	District	Existing area under horticultural crops (acres)	Gross cropped area (acres) 2022-23	Potential area Expansion (acres) (Next ten years 2035)	Potential area Expansion (acres) (Next five years 2030)	Potential
18	Yadadri Bhuvanagiri	23020.10	741538	16063	10000	M
19	Mancherial	22396.04	433483	62000	15000	M
20	Jangoan	19532.83	593148	10555	15000	H
21	Nirmal	18963.00	704728	83800	35000	H
22	Mahabubnagar	18372.18	525430	40700	20000	M
23	Hanumakonda	16656.57	441545	13747	10000	H
24	Narayanpet	15971.16	590455	5430	2000	M
25	Karimnagar	11595.00	637365	7085	2000	M
26	Peddapalli	9982.00	511658	8082	2000	M
27	Kumuram Bheem (Asifabad)	5138.00	424523	7609	7000	M
28	Medchal-Malkajigiri	8082.42	45613	8082	8000	M
29	Medak	7668.18	632515	8685	8000	M
30	Rajanna Sircilla	6980	419450	10080	10000	M
31	Kamareddy	6138.74	949043	7316	5000	M
32	Adilabad	5856.18	743460	8906	5000	M
	Total	1311401	21344783	1624390	572000	
H-High potential, M-Medum potential						

Crop diversification, integration of horticulture with agriculture and livestock through suitable cropping systems and farming systems as per the resource availability will help in attaining higher returns per unit area. Research on development of improved varieties, location specific technologies, climate resilient technologies and post harvest management and value addition is to be intensified. Crop specific strategies are to be followed.



Strategies for crops surplus/deficit in production

Crops	Strategies
Surplus in production	Post-harvest management and processing Quality improvement Increase in exports Strengthening of Marketing and infrastructure
Deficit in production	Increase in area in cluster mode Increase in productivity Farm mechanization Optimum resource use for increasing resource productivity Reduce post-harvest losses Quality improvement Processing and value addition Strengthening Marketing and infrastructure Strengthening research on crop improvement, production and protection technologies

University officials and scientists have identified the potential districts for area expansion in fruits, vegetables and flower crops.

Fruits

Table 23: Gap in production and consumption in fruits

Year	Consumption Demand (Lakh Tonnes)	Total Demand (Lakh Tonnes)	Production 2023-24 (Lakh Tonnes)	Deficit (Lakh Tonnes)	Present Productivity (t/acre)	Area expansion (Lakh acres)
2025	14.05	23.18	18.65	4.53	4.48	1.00
2030	14.28	23.56	18.65	4.91	4.48	1.32
2035	14.39	23.74	18.65	5.09	4.48	1.40

From the above Table 22, it is seen as per the actual consumption demand, the production of total fruits is sufficient and the state is in surplus. But when we see the post-harvest losses, processing demand and the export potential, the state is in deficit. There is wide variation in the composition of the fruits in production and consumption in the state. As per the actual consumption, some crops are in surplus and others are in deficit in the state.



Table 24: Composition of fruits in production and consumption in Telangana

Crop	Percent to total fruits production	Percent to total fruits Consumption
Mango	50.37	26.53
Sweet Orange	21.20	
Acid Lime	4.86	
Guava	4.91	10.88
Pomegranate	0.59	
Apple		27.21
Grapes	0.44	10.88

Additional area is required for to meet the deficit estimated demand in fruit crops as per the priority in the state. Besides area expansion, productivity enhancement through adoption of improved varieties and management practices will help in increasing the production and reducing the cost of production in the existing areas.

Area Expansion

Potential Area Expansion in Fruit Crops by 2030

Sr. No	Crop	Scope for Area Expansion (Acres)
1	Mango	-
2	Sweet Orange	-
3	Guava	18000
4	Papaya	6000
5	Banana	32000
6	Sapota	4000
7	Pomegranate	40000
8	Dragon Fruit	2,000
9	Grapes	9000
10	Date Palm	1000
11	Fig	9000
12	Jamun	2000
13	Amla	1000
14	Custard apple	8000
Total		1,32,000



Recommended varieties, spacing and management for area expansion in fruit crops

Sr. No	Crop	Variety	Scope for Area Expansion (Acres)	Spacing (m)
1	Mango		-	-
2	Sweet Orange		-	-
3	Guava	Allahabad Safeda, Lucknow-49 & SRD-1 (Pink fleshed)	18000	6 x 6, 3 x 6, 3 x 3, 1.5 x 3, 1 x 2
4	Papaya	Taiwan	6000	1.8 x 1.8, 1.5 x 1.5
5	Banana	Grand Naine	32000	1.8 x 1.8, 1.5 x 1.5
6	Sapota	Kalipatti	4000	5 x 5
7	Pomegranate	Bhagwa	40000	5 x 5, 5 x 3, 4 x 3
8	Dragon Fruit		2,000	
9	Grapes	Manjari Shyama & Manjari Medika	9000	4 x 4, 3 x 3, 3 x 2
10	Date Palm		500	8 x 8
11	Fig	Pune Variety	9000	4 x 4, 2.5 x 2.5
12	Jamun	Konkan Bahadoli	2000	8 x 8
13	Amla	NA-7	700	6 x 6, 4 x 5, 3 x 3
14	Custard apple	Balanagar	8000	2.5 x 2.5

Precision farming: High density, Raised bed, Fertigation

Increase the Productivity

Productivity in existing orchards can be increased by adopting SKLTGHU available technologies.

Mango

Present productivity: 3.5 tons/acre

Potential productivity: 5 tons/acre

Interventions of SKLTGHU

- ✓ Center Opening
- ✓ Spraying of KNO_3 @ 10 g per litre and Boron 1.25 g per litre
- ✓ Fertigation of mango
- ✓ Installation of the Fruit Fly traps 20 per acre
- ✓ Fruit bagging



Anticipated Value

- Rs 1200 crores to GSVA value addition if implemented in 2 lakh acres

Sweet Orange

Present productivity: 8 tons/acre

Potential Productivity: 10 tons/ acre

Interventions of SKLTGHU

- ✓ Foliar micronutrient spray
- ✓ Spraying of KNO_3
- ✓ Effective Management of Mites
- ✓ Bahar treatment

Anticipated Value

Rs 60 crores to increase the GSVA if implemented in 20000 acres in Nalgonda and other districts

Guava

Present productivity: 8 tons/acre

Potential productivity: 10 tons/acre

Interventions of SKLTGHU

- ✓ Pruning
- ✓ Spraying of KNO_3 @ 10 g per litre
- ✓ Integrated Nutrient Management
- ✓ Installation of the Fruit Fly traps 20 per acre

Anticipated Value

76 crores to the GSVA if implemented in 10000 acres



Pomegranate

Present productivity: 4 tons/acre

Potential productivity: 5.0 tons/acre

Interventions of SKLTGHU

- ✓ Micronutrient spray 2-3 times
- ✓ Fertigation during the fruit growth period
- ✓ Effective management of the bacterial blight

Anticipated Value

Rs 5 crore to GSVA from 1000 acres

Grapes

There is good scope for area expansion and export of grapes as Telangana is suitable for table grape cultivation. However, grape cultivation in Telangana is decreased and at present confined only to 600 acres in Rangareddy and Medak districts. There is a need for area expansion with special emphasis on post-harvest management, value addition, marketing and export to make it a viable enterprise.

Increase the Production Potential

SKLTGHU

- Develop new varieties with high yield potential and tolerance to biotic and abiotic stresses
- Development of production and protection technologies for optimum and efficient utilization of resources



Vegetables

Table 25: Composition of vegetables in production and consumption in Telangana

Crop	Percent to total vegetables production	Percent to total vegetables consumption
Tomato	33.93	14.77
Brinjal	6.19	4.70
Green Chilli	5.90	6.04
Onion	9.66	14.23
Bhendi	3.91	6.44
Gourds	9.77	13.02
Beans	3.44	4.43
Leafy vegetables	5.36	9.40
root vegetables	8.77	10.87
others	13.05	16.11

Table 26: Requirement of additional area to meet the Deficit demand as per actual consumption

	Deficit as per consumption demand (Lakh tons)			Deficit as per total demand (Lakh tons)			Present productivity (t/acre)	Additional area as per consumption demand (Lakh acres)			Additional area as per total demand (Lakh acres)		
	2025	2030	2035	2025	2030	2035		2025	2030	2035	2025	2030	2035
Leafy vegetables	2.40	2.46	2.48	3.92	4.00	4.04	5.14	0.47	0.48	0.48	0.76	0.78	0.79
Tuber crops	2.39	2.46	2.49	4.1	4.19	4.23	8.65	0.28	0.28	0.29	0.47	0.48	0.49
Other vegetables	19.16	19.62	19.84	31.75	32.4	32.73	9.00	2.13	2.18	2.20	3.53	3.60	3.64
Total	23.96	24.53	24.81	39.77	40.59	41.00	9.89	2.42	2.48	2.51	4.02	4.10	4.15

Table 27: Requirement of additional area to meet the Deficit demand as per ICMR recommendations

	Deficit as per consumption demand (Lakh tons)			Deficit as per total demand (Lakh tons)			Present productivity (t/acre)	Additional area as per consumption demand (Lakh acres)			Additional area as per total demand (Lakh acres)		
	2025	2030	2035	2025	2030	2035		2025	2030	2035	2025	2030	2035
Leafy vegetables	14.05	14.28	14.39	20.37	20.71	20.87	5.14	2.73	2.78	2.80	3.96	4.03	4.06
Tuber crops	14.05	14.28	14.39	20.37	20.71	20.87	8.65	1.62	1.65	1.66	2.35	2.39	2.41
Other vegetables	28.1	28.56	28.78	40.75	41.41	41.73	9.00	3.12	3.17	3.20	4.53	4.60	4.64
Total	56.21	57.12	57.56	81.50	82.82	83.46	9.89	5.68	5.78	5.82	8.24	8.37	8.44



Area Expansion

Strategies

- ✓ Identification of potential districts in the state for vegetable expansion. Classify the districts as high potential, medium potential and low potential and plan for area expansion
- ✓ Motivating the farmers for taking up vegetable cultivation
- ✓ Area expansion in a cluster mode

Table 28: Area expansion under vegetables by 2030

Crop	Additional area in acres
Tomato	10794
Brinjal	7801
Carrot	2758
Cabbage	6039
Cucumber	7473
Cauliflower	6355
Radish	1330
Onion	40586
Potato	24393
Leafy Vegetables	53731
Ridge gourd	15137
Green Chilli	22521
Bhendi	24300
Bottle Gourd	9648
Bitter gourd	6133
Others	6000
Total	2,45,000

Critical inputs

- ✓ Seeds
- ✓ Low cost polyhouse
- ✓ Shade net cultivation in lean periods
- ✓ Mulching
- ✓ Micro irrigation
- ✓ Pandals for creeper vegetables



- ✓ Subsidy for pandals
- ✓ Off season vegetable production
- ✓ Localized markets with low cost cold storage facility and transport
- ✓ Processing and cold chain
- ✓ Exports

Lean periods for different vegetable crops

Sr. No	Crop	Lean period
1	Tomato	May – August
2	Onion	July - October/November
3	Bhendi	November – March
4	Green Chilly	January – March September – December
5	Ridge Gourd	December – January June – July
6	Beans	May – June
7	Bitter Gourd	December – January June – July
8	Coccinia (Donda)	February – May
9	Bottle Gourd	December – January June – July
10	Cabbage	March – June
11	Drumstick	May – August
12	Cucumber	June – October
13	Cauliflower	March – June
14	Capsicum	Year round
15	Leafy Vegetables	January – August
16	Potato	May – December
17	Carrot	February – June
18	Colocasia	Year round
19	Radish & Beet root	February – November

Due to the lean period in production, arrivals to market and prices are fluctuating in different months of the year and not able to match the year-round demand.



Strategies for year round production of vegetables

- ✓ Staggered planting of vegetables
- ✓ Cultivation of the vegetables under shade nets
- ✓ Encouraging protected cultivation in lean season

Increase the Productivity

Implementation of SKLTGHU technologies to harness maximum attainable yield

- ✓ Fertigation
- ✓ Mulching
- ✓ Staking
- ✓ Drip irrigation
- ✓ INM, IPM, IWM, IDM
- ✓ Grafting
- ✓ Raised bed cultivation
- ✓ Growing Vegetables on pandals
- ✓ Protected Cultivation

Increase the Production Potential

SKLTGHU

- Develop new varieties and hybrids with high yield potential and tolerance to biotic and abiotic stresses
 - ✓ Vegetable grafting
 - ✓ speed breeding
 - ✓ Climate resilient varieties
- Development of production and protection technologies for optimum and efficient utilization of resources



Spices

Chilli

Crop	Present area under cultivation (acres)	Present Annual Production (MT)	Surplus or deficit (MT)
Red Chilli	3,92,303	7,94,417	Surplus

Chilli area can be increased only when there is good marketing and export.

Strategies

- ✓ Exploit the opportunities for red chilli processing
- ✓ Setting up oleoresin extraction industries (export potential)
- ✓ Processed & value-added products like red chilli paste, red chilli powder, chilli pickles, red chilli flakes etc
- ✓ Good management practices are to be followed to harvest the required quality product for export
- ✓ Reduction of pesticide residues

Warangal Chapata Chilli

- ✓ Popularly called as Tomato mirchi, Desi Mirchi or Single or Double Patti
- ✓ Cultivated in Warangal, Hanmakonda, Mulugu, Bhupalapally and Khammam districts
- ✓ Fruits are small, flat, thick skin with cavity at Pedicel
- ✓ Less Pungency (3100-6500 SHU), more colour (130-150 ASTA)
- ✓ Good for natural colour and oleoresin extract
- ✓ Used for Pickles



Notable Contribution of SKLTGHU

- University facilitated in getting Geographical Indication (GI) tag for Warangal Chapata chilli to Telananga during April, 2025

Turmeric

Turmeric area can be increased by addressing the constraints in the production like availability of good varieties, mechanization and value addition

Strategies

- ✓ Availability of improved varieties
- ✓ Mechanization (Seed sowing machines, Boilers polisher, dryers)
- ✓ Boosting the exports of turmeric
- ✓ Value addition and agro industries
- ✓ Adoption of technologies available: Raised bed method, 3 to 4 rows with mulching, drip irrigation and fertigation improves the yield up to 20 to 30 percent and reduces the cost of the weed management

Ginger

Area under ginger can be increased by adopting the following measures

- ✓ Availability of pure seed material (Maran)
- ✓ Reduce cost of cultivation
- ✓ Mechanization (Seed sowing machines, Boilers)
- ✓ Shade Cultivation
- ✓ Processing and value addition
- ✓ Adoption of available technologies



Plantation Crops

Oil Palm

Area expansion: 4.00 lakh acres by 2030

Government of India has identified 31 districts in Telangana for oil palm cultivation. However, oil palm has to be encouraged in the areas where perennial water resources are available and sufficient irrigation water is available even in summer to avoid water stress in summer.

Strategies

- ✓ Availability of quality planting material in non traditional areas
- ✓ Proper management practices in younger orchards of non-traditional areas
- ✓ Intercrops in young and mature gardens
- ✓ Expansion of processing units in the state
- ✓ Management of Rhinoceros betel and Rugose spiraling whitefly, Diseases *i.e.*, Bud rot, ganoderma and stem wet rot

Cocoa

- Present area – around 1,000 acres restricted to Kothagudem & Khammam districts.
- Purely growing as intercrop in palm based cropping systems *i.e.*, Coconut + Cocoa, Oil palm + Cocoa and Arecanut + Cocoa.
- Potential scope for area expansion in coming years in the state, as the younger oil palm gardens will create favorable growing conditions (partial shade) for cocoa crop.



Strategies

- Need to make more availability of quality planting material in non traditional areas
- Create awareness among the farmers about the crop management practices.
- Need to expand the processing units in the state

Flower Crops

As Telangana has good network of transport for other states and other countries, area can be expanded with more emphasis on quality, shelf life and value addition

Table 29: Area expansion under flowers by 2030

Crop	Potential area expansion (Ha)
Chrysanthemum	1500
Marigold	950
Rose	800
Tuberose	260
Jasmine	100
Cut flowers	177.7

Postharvest and Processing

Post-harvest losses are very high in horticultural crops ranging from 20-40 percent. Fruits and vegetables are perishable commodities. Studies say that total losses in fruits is about 20-30% and in vegetables it is about 30-35% due to their highly perishable nature. The pre-harvest losses change from crop to crop and the factors are abiotic (temperature, light, wind, salinity, hail damage, physiological disorders) and biotic factors (insect infestation, diseases, etc.). Fresh fruits and vegetables decay in very short period lowering their quality, market value and consumer acceptability. All fresh horticultural crops are high in water content and are subject to shriveling in a very less time. They are also susceptible to attack by bacteria and fungi, resulting in deterioration. Inefficient handling, transportation, storage occurs throughout the



value chain from producer to consumer. The main reason of these losses is lack of post-harvest storage and processing facilities. A study by the Ministry of Food Processing Industries, estimated annual losses at ₹ 1,52,790 crore. These post-harvest losses sometimes result in demand supply mismatch even under good production conditions contributing to widespread price fluctuations and gap between total production and net availability.

According to UN's FAO report, globally around 1.3 billion metric tonnes of food, which is 33 percent of the total produce, is lost in the post-harvest stage and it predicts that if the current practices continue then the loss would be around 2.1 billion metric tonnes by 2030. In India, as per the latest report, food worth of Rs.92651 crores is lost in post-harvest processes before it reaches the consumer. This monetary value is approximately 40 percent of the total produce in India, making India one of the few countries to have higher post-harvest losses. The loss due to post-harvest losses in Telangana range from Rs 3500 to 5000 crores annually.

Existing Post Harvest Infrastructure in Telangana

Multi-purpose cold storage units, controlled atmosphere (CA) storage units, integrated pack house, pre-cooling facilities & ripening chambers, refrigerated transport are the major post-harvest infrastructure required for preservation of perishable produce such as fruits and vegetables.

As on today, there are 4 major food park projects worth Rs 492 Cr, 7 integrated cold chain projects worth Rs 208 Cr, 20 NMFP projects worth Rs 108 Cr in the state. In Telangana 460 Farmer Producer Organizations (FPO), 3989 Food Processing Industries are engaged in processing of agriculture and allied sectors.

At present 180 cold storages are available in the state. Cold Storages are usually used to store dry chilli, turmeric, seed spices, fruits, vegetables and seeds. Fifty five percent of the total cold storage capacity exists in the turmeric and red chilli producing districts viz., Nizamabad, Gadwal, Khammam, Warangal, and Suryapet. Seven Integrated Pack house cum Cold Storages recognized by APEDA are also available.



Strategies to Reduce Post-Harvest Losses

Cold Storage Units - Single Temperature

As horticultural produce is perishable, particularly fruits and vegetables, cold storage infrastructure is one of the most important factor to reduce postharvest losses. Cold storages are required to extend shelf life, improve quality and increase the income of the farmers. Further, these structures are also useful for spices to avoid market glut and get remunerative price.

In view of the projected production and demand in fruits and vegetables, Centre for Good Governance, Hyderabad, assessed scope to establish 30 more cold storage units in addition to the 180 units available in the state with a capacity of 8.38 Lakh MTs.

Cold Storage Units - Multi-chamber for Vegetables and Flowers

Multi chambered cold storage units enable storage of multiple commodities at required temperature and relative humidity separately. As there is scope to store vegetables and flowers separately in multiple chambers, 50 No. of Multi temperature, multi chamber cold storage units can be established at potential vegetable and flower growing areas.

Ripening Chambers

Ripening chambers are specialized storage facilities used to control the ripening process of fruits and vegetables, ensuring optimal quality and shelf life. They regulate temperature, humidity and ethylene levels to create the ideal environment for ripening, either accelerating or slowing down the process. Ripening Chambers are required for fruits viz., Mango, Banana, Papaya



Export oriented integrated pack houses with suitable infrastructure for promoting exports

Export oriented Integrated Pack house in Rangareddy district is required to encourage exporters of horticultural produce to meet the International standards. The infrastructure shall comprise of grading and packing lines, precooling & cold room units. Integrated packing protocols may be developed for mango and other crops for full capacity and round the year utilization. One Integrated Pack house at Shamshabad International Airport is essential to cater the present needs.

Vegetable Market Yards with Storage Facility

There is every need to focus on improving the marketing facilities for horticultural commodities as compared to marketing of agricultural commodities. Horticultural produce marketing in the state is unorganised. To ensure better price realization to the farmers and availability of fresh and quality vegetables to the consumers, horticultural marketing system should be brought under organised sector. Though 31 Rythu bazars are there and scheme *Mana ooru mana kooragayalu* is working in this direction, this needs more focus. It is required to establish an Integrated Vegetable Market Yard with cold storage facility of 100 MT (Multi temperature), cold room - cum- pre cooling unit (6 MT capacity) under Public Sector in the major vegetable clusters to facilitate farmers to either directly sell their produce or store for a few days based on demand. The Government has taken initiative in April, 2025 for sale of fruits, vegetables and flowers in major agricultural market yards which should be followed in true sense. Budget to establish these facilities need to be provided.

Refrigerated Transportation: Refrigerated trucks and transport is a must for maintenance of freshness during transit from farms to markets.

Strengthening Supply Chains: Coordination and cooperation among farmers, processors, distributors, and retailers to reduce delays and improve efficiency to be enhanced.

Direct Selling Mechanisms: Promote farmer's direct interaction with consumers through farmer markets, online platforms and community-supported agriculture.



Adoption of Best Practices: Educate farmers and handlers about maintaining cleanliness during harvesting, handling and storage to prevent contamination. Good quality of fruits and vegetables, for converting into value added products can be assured only when harvesting is done at the proper stage of maturity. Farmers should be trained on these aspects. KVKs and FPOs need to focus on this aspect

Proper Handling Techniques: Workers should be trained in handling to minimize physical damage during transportation and distribution. Department of horticulture and marketing need to distribute more number of plastic crates to reduce handling losses.

Low-cost ventilated Onion Storage Structures: Onion supply volatility creates high fluctuation in the prices and storage facility will help to reduce the distress situation both to the farmers and consumers. Currently onions are stored in well ventilated local infrastructure made with bamboo, wood or iron mesh over a covered roofing. Need to create more Low-cost ventilated Onion Storage Structures.

Price Stabilization: Develop mechanisms that stabilize market prices, reducing the pressure on farmers to sell quickly and at lower rates. There should be control over commission agents at market level by Department of Marketing.

Research: Research on quality promotion, shelf life, storage and post-harvest handling, pesticide residue free produce and identification of Maximum Residual Levels (MRLs) of new molecules and development of weather based pest and disease forecasting modules need to be intensified.

Processing of Horticulture Produce

National Level Scenario

Food Processing sector is an important segment of the Indian economy in terms of its contribution to GDP, employment and exports. During the years from 2013-14 to 2021-22, the sector has been growing at an Average Annual Growth Rate of around 7.26%. Gross Value Added (GVA) in this sector has also increased from 1.30 lakh crore in 2013-14 to 2.08 lakh crore in 2021-22. Food processing sector is one of the largest employment providers in the organized manufacturing sector with 12.41 percent employment in the total registered/organized sector as per the report of Annual Survey of Industries (ASI), 2022-23.



The objective of processing is preparing foods for consumption, preservation by slowing or stopping decay to extend shelf life, ensuring safety, and enhancing taste and nutritional profiles. India is the 2nd largest producer of fruits and vegetables in the world with a share of 11.7 and 17.8 percent, respectively and had a record horticultural production of 355.48 million tonnes in 2022-23. In a study conducted by Indian Council of Agricultural Research-Central Institute of Post-Harvest Engineering and Technology in 2015, 6.7- 15.8 percent of the fruits and 4.5 -12.4 percent of vegetables produced in the country are lost due to poor post-harvest handling. National Bank for Agriculture and Rural Development, in its report in 2020, also corroborated this fact that post-harvest handling is responsible for 20-30 percent of losses, which amounts to Rs. 1,52,000 crores, across various stages, including storage, grading, packaging, shipping and marketing, whether as fresh produce or in processed form. These losses primarily occur in the farmer's field (15-20 percent), during packaging (15-20 percent), transportation (30-40 percent), and marketing (30-40 percent). Thus, food processing has a critical role in achieving food and nutrition security. Fresh fruits and vegetables contain many vitamins, minerals, dietary fibre and other nutrients and are an important part of the human diet. Processing has utmost importance for perishable commodities like fruits and vegetables to optimize nutrient availability and food quality and reduce losses and waste.

The global market for fruit and vegetable ingredients is estimated at US\$ 194.1 billion in 2023 and is projected to reach US\$ 286.8 billion by 2030 and expected to grow with a compound annual growth rate (CAGR) of 5.7 percent from 2023 to 2030. The world demand for processed vegetables in the year 2022 was 28.3 million MT by volume and valued at 40 billion USD.

India is the 6th largest food and grocery market in the world and food processing industry contributes 32 percent to this food market. The market size of the food processing sector in India is estimated to reach US \$1,274 billion in 2027 from US\$ 866 billion in 2022. Food processing industries also contributes 13 percent to total export and 6 percent to the industrial investment. The growing consumption of food is expected to reach US\$ 1.2 trillion by 2025-26, owing to urbanization and changing consumption patterns. However, food processing levels remain significantly lower in India in comparison to global standards. India currently processes less than 10 percent of its agricultural output which comprises only around 2 percent of fruits and vegetables, 6 percent of poultry, 21 percent of meat, 23 percent of marine and



35 percent of milk. Further, the share of India's high-value and value-added agricultural produce in its agriculture export basket is less than 15 percent, compared to 25 percent in the US and 49 percent in China. The Indian Fruit Juice Market is expected to grow at a robust 7.76 percent CAGR, reaching a market size of US\$ 537.172 million in 2030 from US\$ 369.703 million in 2025. Horticulture industry is one of the big resource and raw material for food processing. This sector constituted 10.54 and 11.57 percent of Gross Value Added (GVA) in manufacturing and agriculture sector, respectively in 2020-21 which was 1.92 lakh crore in 2022-23.

India stands as one of the largest exporters of cucumber and gherkins globally, exporting 28 percent by volume and 25 percent by value of the global demand between 2020-2022. Still a noticeable gap between the world's demand and supply, which can be explored by India. India exported processed vegetables worth US\$ 526.93 million, equivalent to 409,699 MT in the year 2022. India's major export destinations for processed vegetables include the USA, UK, Germany, Spain and the Netherlands. Employment generation has been the significant outcome of the growth of this sector, directly employing about 20.05 lakh people across 40,579 registered food processing factories. The Indian food processing sector accounts for 32% of the entire food market, one of India's major industries and ranks fifth in terms of output, consumption, export and anticipated growth (IBEF 2022). The Southern region of India dominates the food processing sector with the highest 5348 registered factories in Andhra Pradesh which accounts for about 14.3 percent of the total units in India, followed by 4764 in Tamil Nadu with share of 12.7 percent, 3598 in Telangana with share of 9.6 percent.

Food Processing in Telangana

Food processing sector plays a vital role in Telangana enhancing the value of the agricultural products. Hardly 2 percent of perishable horticultural produce is processed to value added products. There is huge scope for processing of fruits and vegetables. In the lean season there is high demand with very small supply and at the same time, there is market glut during harvesting season and farmers are forced to sell their produce at throw away prices. Food processing can help farmers to get assured income for their produce and also avoid market glut.



Food processing has been identified as one of the 14 thrust sectors for the state in the industrial policy framework of 2014. Currently, Food processing industry in Telangana processes 25% agri & allied output by value and adds 12.5% in value. Four Major Food Parks are being established in Telangana State with assistance from Government of India.

Constraints faced by the Food Processing Industries

- Gaps in supply chain infrastructure
- Inadequate primary processing, storage and distribution facilities
- Lack of focus on quality and safety standards
- Insufficient connection between production and processing
- Seasonality of raw material availability and low capacity utilizations

However, the state has a good potential in processing of horticultural produce. It has 4.45 lakh metric tonnes warehousing capacity and 4.10 lakh metric tonnes cold storage facility. There is every need to focus on contract farming by FPOs.

The state is the leading producer of sweet orange, which has enormous opportunity to set up many food processing industries for preparation of squash, juice, concentrate. It is in surplus production of mangoes, tomatoes and turmeric but only few processing units are available at present in the state indicating huge potential for starting new units. Tomato sauce, ketchup, powder and juice are the commercial processed products that has huge demand and good scope for processing. Mango has several value added products like juice, squash, candy, pickles and powder. Though area under grapes decreased, there is scope for area expansion and processing. Oil palm plantations have increased during last two years, bearing of fresh fruit bunches increase in the next three years gives huge scope for establishing new oil extracting units in the state.

One District-One Product (ODOP) Scheme

Government of India is giving importance to implement one district-one product (ODOP) scheme in states. PM Formalisation of Micro food processing Enterprises Scheme (PM FME) is a scheme with an aim to provide financial, technical, and



business support to micro food processing units in the country. About 2 lakh micro food processing units will be given direct financial assistance in the form of credit linked subsidy under the scheme. Moreover, institutional architecture and common infrastructure facilities in the sector will also be given adequate support. The funding under the scheme will be shared by the Centre and State government in the ratio of 60% by Centre and 40% by Telangana State.

Districts Identified in Telangana

Chilli based Products:

Bhadradi Kothagudem, Jayashankar Bhupalapally, Khammam, Mahabubabad, Mulugu, Warangal Rural

Vegetable Processing:

Siddipet, Vikarabad, Ranga Reddy

Mango Based Products:

Jagtial, Nagarkurnool, Mancherial

Turmeric Based Products:

Nizamabad

Sweet Orange Based Products:

Nalgonda

Marketing

Due to the bulkiness, seasonal production and perishable Nature of horticulture products, it is very difficult and risky to market them. Due to their high perishability, fruits and vegetables may give even negative returns if they are not sold quickly after harvest. Currently, the majority of the fruit and vegetable trade is unorganized in the state.

At present Telangana has 193 Agricultural Produce & Livestock Market Committees, 460 Farmer Producer Organizations (FPO), 57 e-NAM Mandis ,72 FCI Warehouses,31 Rythubazars and 182 Mandis.



In Telangana, marketing of vegetables has a variety of channels, including direct producer-to-consumer sales, traditional commission agents, and organized collection centers. Major marketing constraints in vegetable marketing are long chain of intermediaries, exploitation by middlemen, inadequate transportation facilities, high transportation charges, lack of marketing facilities at local place, inadequate storage facilities, maintenance of cold chain, lack of pack houses, low and non remunerative price, price fluctuations and non-availability of market information.

Strategies to Strengthen Marketing

The state government supports vegetable marketing through initiatives like the "Mana Ooru Mana Kuragayalu" project, which aims to establish collection and distribution facilities, along with retail outlets and mobile units to reach consumers in urban areas. Telangana is implementing various initiatives to improve the marketing of horticultural crops, including the Telangana State Horticulture Development Corporation, Cluster Development Programme. Sale of fruits and vegetables in the major market yards on pilot basis is the welcome step by the Government of Telangana in strengthening marketing of horticultural crops in the state.

Promotion of Farmers Producer Organizations (FPOs)

Farmer Producer Organizations (FPOs) are also encouraged to facilitate collective marketing and strengthen pre- and post-harvest interventions. The Department of Agriculture & Farmers' Welfare (DAC & FW), Ministry of Agriculture, Government of India launched a pilot programme for promoting Farmer Producer Organisations (FPOs) during 2011-12.

The basic objective of FPOs is to provide holistic and broad-based supportive ecosystem to facilitate development of vibrant and sustainable income-oriented farming and for overall socio-economic development and wellbeing of agrarian communities. FPOs facilitate farmers especially small and marginal farmers to come together who lack access to resources, market linkages and bargaining power and work with a common goal. They help in enhancing the productivity through efficient,



cost-effective and sustainable resource use and realize higher returns through better liquidity and market linkages for their produce and become sustainable through collective action.

Farmer Producer Organisation is a generic name, which refers to farmer-producers' organization incorporated/ registered either under Part IXA of Companies Act or under Co-operative Societies Act of the concerned States and formed for the purpose of leveraging collectives through economies of scale in production and marketing of agricultural and allied sector. The concept behind Farmer Producer Organizations is that farmers, who are the producers of agricultural products, can form groups. To facilitate this process, the Small Farmers' Agribusiness Consortium (SFAC) was mandated by Department of Agriculture and farmers welfare, Ministry of Agriculture, Govt. of India, to support the State Governments in the formation of Farmer Producer Organizations (FPOs). The main goal of FPOs is to mobilize farmers into member owned companies that manage the entire supply chain, including post-harvest activities. This makes FPOs a unique and distinguished model compared to other forms of aggregation.

These FPOs promoted by the farmers will be run by farmers and for the benefit of the farmers. Paid staff can be employed to assist in the management of the company. The share capital of Producer Company shall consist of equity shares contributed by members only and members' equity cannot be publicly traded but can be transferred. The profits generated from the business of the company would be shared among the farmer members-only in terms of dividends.

Marketing of horticultural produce is very risky due to perishability and unorganised system of marketing mostly dependent on commission agents and producers have very little or no bargaining powers. FPOs help the farmers in effective production and marketing. The Central Sector Scheme for "Formation and Promotion of 10,000 Farmer Producer Organizations (FPOs) was launched by Prime Minister Shri Narendra Modi on 29th February 2020. The scheme was launched with a budget outlay of ₹6,865 Crore till 2027-28. The scheme may be effectively utilised for effective marketing through promotion of FPOs in Telangana.



Market Intelligence

The agricultural and horticultural market situation is changing from time to time affecting farm prices and inturn farm income. Prices have a significant influence on arrivals and production. Market Intelligence is the process of collecting appropriate information related to the existing market prices, domestic and global supply and demand conditions, policy environment, stakeholders' perceptions and other relevant factors, processing, forecasting through scientific modelling and disseminating through different means to the farmers and other stakeholders to enable them to take decisions on production and disposal of the produce. A Market Intelligence Unit may be setup for horticultural crops in SKLTGHU in collaboration with department of Agriculture Marketing for forecasting of the prices of horticultural crops. The data need to be disseminated to farmers through research stations, KVKs, Department of Horticulture through different media.

Export Promotion

India ranks second in fruits and vegetables production in the world, after China. Amongst fruits, it ranks first in production of bananas, papayas and mangoes. Among vegetables, India ranks second in the production of potatoes, onions, cauliflowers, brinjal, Cabbages. India is the largest producer of ginger. The horticultural products are mainly exported to the Middle East, Southeast Asia, SAARC countries, the European Union and the USA. Telangana is the lead horticulture growing state in the country. However, export of fruits and vegetables is very small from Telangana due to many constraints.

As per available literature based on the studies and reports by different expert groups, the constraints range from production practices, post-harvest management to supply chain.

Production and supply constraints

- Low productivity of horticultural crops and inferior quality of produce
- Lack of consistency in supply and quality



- Availability of small quantities at a place due to majority of holdings are marginal and small and un-irrigated
- Weather fluctuations affecting the yield and quality
- High incidence of pests and diseases and indiscriminate use of fertilizers and pesticides
- High pesticide residues

Post Harvest and supply chain constraints

- Long and complex supply chain involving more number of commission agents and traders
- Lack of forward and backward linkage between producers/ buyers/ exporters
- Highly perishable resulting in high post-harvest losses and increase the cost
- Inadequate and quality transport facilities
- High transport and freight charges
- Lack of cost competitiveness due to high cost of production, intermediaries and post harvest losses
- Inadequate cold storage facilities
- Non-tariff barriers like import policy barriers; high standards; certification; Anti-dumping; export subsidies and domestic support
- Multiple safety standards
- Stringent phyto-sanitary requirements
- Lack of coordination among the departments

Strategies to Improve Exports

- Cluster wise promotion of commodities viz., mango, guava, orange, papaya, potatoes, vegetables to increase quantity and supply consistency.
- Judicious use of pesticides to avoid consignment rejection due to pesticide residues



- Good management practices in production and post harvest management to improve the quality and the shelf life as per export requirement: mechanized harvesting, sorting, grading, pre-cooling, waxing, packaging and others
- Strengthen backward linkages for quality inputs
- Training to the farmers on production, harvesting practices and post harvest management at the farm level
- Awareness about the quality standard requirement of different importing countries
- Adequate and upgraded infrastructure for storage, transportation and processing like irradiation, vapour heat treatment
- Encourage export of value added processed fruits and vegetables
- Strengthen forward linkages to enable direct farmer exporter linkages
- Coordination among various departments involved in exports help in a hassle free process of export.



Action Plan for the Next 10 Years

To meet the demand of fruits and vegetables, spices in the human diet BY 2035 as per the ICMR recommendations, making allowances to post-harvest losses and processing and export demand, the following strategies are to be followed.

Strategy	Time frame	Departments to be involved
Area Expansion	First Phase: 5 years Second Phase: 10 years	Department of Horticulture, SKLTGHU, NABARD
Productivity Enhancement through adoption of available technologies	Continuous	SKLTGHU Department of Horticulture NABARD
Productivity Enhancement through development of new varieties and profitable agro techniques	10 years	SKLTGHU
Efficient marketing	First Phase : 5 years Second Phase : 10 years	Department of Marketing Department of Horticulture
Increase the export earnings	First Phase : 5 years Second Phase : 10 years	Department of Marketing Department of Horticulture APEDA
Post harvest management and value addition	First Phase : 5 years Second Phase : 10 years	SKLTGHU Department of Horticulture Department of Marketing Ministry of Food Processing NABARD



Area Expansion in the next 10 years

Sr. No	District	Potential area Expansion (acres) (Next ten years: 2035)	Potential area Expansion (acres) (Next five years: 2030)	Potential
1	Khammam	104834	35000	H
2	Bhadradri Kothagudem	66465	35000	H
3	Mahabubabad	275150	35000	H
4	Jogulamba Gawal	112723	35000	H
5	Nalgonda	108497	35000	H
6	Ranga Reddy	79905	15000	M
7	Nagarkurnool	20120	10000	M
8	Jagtial	72200	35000	H
9	Suryapet	66750	35000	H
10	Siddipet	47701	35000	H
11	Vikarabad	14852	8000	M
12	Nizamabad	15450	10000	M
13	Sangareddy	11049	5000	M
14	Warangal	25227	25000	H
15	Jayashankar Bhupalpalli	36245	35000	H
16	Mulugu	31981	15000	M
17	Wanaparthi	237101	15000	M
18	Yadadri Bhuvanagiri	16063	10000	M
19	Mancheri	62000	15000	M
20	Jangoan	10555	15000	H
21	Nirmal	83800	35000	H
22	Mahabubnagar	40700	20000	M
23	Hanumakonda	13747	10000	H
24	Narayanpet	5430	2000	M
25	Karimnagar	7085	2000	M
26	Peddapalli	8082	2000	M
27	Kumuram Bheem (Asifabad)	7609	7000	M
28	Medchal-Malkajigiri	8082	8000	M
29	Medak	8685	8000	M
30	Rajanna Sircilla	10080	10000	M
31	Kamareddy	7316	5000	M
32	Adilabad	8906	5000	M
		16,24,390	5,72,000	

H-High potential, M-Medium potential



The districts were categorised into high and medium potential, and the area can be increased to an extent of 5,72,000 acres in the first five years, with priority in the high potential districts. Area under horticultural crops should be increased in different districts based on the suitability of soil, climatic conditions and marketing potential. The area expansion should be on a cluster basis for efficient production and marketing.

Action Plan for Next 5 Years

An area of 1,32,000 may be increased under fruits in the identified potential districts as detailed below.

Potential districts for Area Expansion in fruits in the next five years: By 2030

Crop	Potential districts
Guava	Ranga Reddy, Vikarabad, Medchal, Sangareddy, Medak, Mahabubnagar, Khammam, Yadadri Bhuvanagiri, Kothagudem, Wanaparthy, Nagarkurnool,
Papaya	Kothagudem, Gadwal, Khammam, Mahabubabad, Nalgonda, Nagarkurnool, Siddipet, Warangal, Vikarabad, Sangareddy
Banana	Khammam, Kothagudem, Mulugu, Sangareddy, Adilabad, Jagtial,
Sapota	Mahabubad, Warangal, Khammam, Mahabubnagar, Suryapet, Ranga Reddy, Nagarkurnool
Pomegranate	Kothgudem, Gadwal, Mahabubnagar, Nalgonda, Sangareddy, Siddipet, Vikarabad
Dragon Fruit	Jangaon, Warangal, Kothagudem, Nalgonda, Mahabubnagar, Gadwal, Nagarkurnool, Sangareddy, Ranga Reddy ,Karimnagar, Jagtial, Sircilla
Grapes	Ranga Reddy, Narayanpet, Adilabad (wine grapes), Asifabad (wine grapes), Sangareddy, Kothagudem (Doligutta), Medchal, Siddipet



Crop	Potential districts
Date Palm	Ranga Reddy, Medak, Sangareddy, Mahabubnagar, Nalgonda, Wanaparthy,
Fig	Sangareddy, Ranga Reddy, Mahabubnagar, Wanaparthy, Gadwal, Siddipet, Nagarkurnool,
Jamun	Kothagudem, Gadwal, Mahabubnagar, Nalgonda, Sangareddy, Siddipet, Vikarabad
Amla	Nalgonda, Mahabubnagar, Nagarkurnool, Gadwal, Adilabad, Mancheri, Sanagreddy,
Custard Apple	All districts

Area under vegetables may be increased to an extent of 2.45 lakh acres in the next five years in the identified potential districts as detailed below

Potential districts for Area Expansion in vegetables in the next five years : By 2030

Crop	Potential districts
Tomato	Ranga Reddy, Siddipet, Vikarabad, Sangareddy, Nizamabad, Gadwal, Warangal, Nalgonda, Medak, Adilabad, Medchal Malkajgiri
Brinjal	Ranga Reddy, Siddipet, Vikarabad, Medchal Malkajgiri, Sangareddy, Warangal, Gadwal, Yadadri Bhuvanagiri.
Carrot	Ranga Reddy, Vikarabad, Suryapet, Hanmakonda, Asifabad.
Cabbage	Vikarabad, Ranga Reddy, Siddipet, Asifabad, Sangareddy.
Cucumber	Nalgonda, Narayanapet, Khammam, Gadwal, Ranga Reddy, Nagarkurnool, Siddipet.
Cauliflower	Ranga Reddy, Vikarabad, Asifabad, Adilabad, Hanmakonda
Radish	Ranga Reddy, Vikarabad, Siddipet, Sangareddy, Kamareddy
Onion	Vikarabad, Gadwal, Sangareddy, Wanaparthy, Narayanapet, Medak.



Crop	Potential districts
Potato	Northern and Central Telangana districts
Leafy Vegetables	Ranga Reddy, Vikarabad, Narayanpet, Siddipet, Suryapet, Jagityal.
Ridge gourd	Siddipet, Medchal Malkajgiri, Ranga Reddy, Warangal, Hanmakonda
Green Chilli	Ranga Reddy, Siddipet, Vikarabad, Sanga Reddy, Asifabad, Rajanna Siricilla, Narayanpet
Bhendi	Ranga Reddy, Siddipet, Gadwal, Khammam, Warangal, Nalgonda
Bottle Gourd	Medchal Malkajgiri, Ranga Reddy, Warangal, Siddipet, Nagarkurnool

Area under flowers may be expanded in the following potential districts.

Potential Districts for Area Expansion in flowers in the next five years: By 2030

Crop	Districts
Chrysanthemum	Ranga Reddy, Vikarabad, Sangareddy, Medak, Mahbubabad and other all districts.
Marigold	Ranga Reddy, Vikarabad, Sangareddy, Medak, Mahbubabad, Bhadradi Kothagudem, Janagaon
Rose	Ranga Reddy, Vikarabad, Mahbubabad, Gadwal, Warangal, Hanmakonda
Tuberose	Ranga Reddy, Vikarabad, Sangareddy, Karimnagar, Warangal, Hanamkonda
Jasmine	Ranga Reddy, Gadwal, Vikarabad, Narayanpet
Cut flowers	Medchal, Ranga Reddy, Vikarabad, Medak, Sangareddy



The area under spices can be increased by about 15,000 acres in the potential districts. Area under plantation crops can be increased to an extent of 4,00,000 acres in a phased manner in suitable districts. The area under medicinal and aromatic plants can be increased in an area of 5000 acres.

Productivity in the existing fruit and vegetable crops can be increased by adopting available SKLTGHU technologies. Infrastructural facilities need to be strengthened in post-harvest, processing and marketing sectors to reduce post-harvest losses, increase returns and the share of farmers in consumer rupee.



Requirements and Financial Implications

Budget for the Horticulture Action Plan in Telangana

Crop/ Particulars	Area (Acres)	Subsidy per acre (Rs)	Total requirement (Rs in crores) for 5 years	Remarks
DRIP IRRIGATION				
Fruits	132000	25000	330.00	The Drip Funds can be tapped from NABARD as NABARD Loan. *The drip subsidy in the fruits should be given to other than mango and sweet orange.
Vegetables	245000	25000	612.50	
		Total	942.50	
Farm Mechanization	612 nos	2000000	122.40	Custom Hiring Center one in each mandal for increasing efficiency through FPOs/FGs.
OTHER INPUT SUBSIDY				
Seed	245000	6000	147.00	The Government can integrate the fund from MIDH, RKVY and other Centrally sponsored Schemes.
Mulching Sheet	245000	5000	122.50	
Integrated Pest Management	245000	5000	122.50	
Vegetable Pandals	10000	100000	100.00	
		Total	492.00	



Particulars	Number	Rs. per Month	Total requirement (Rs in crores) For 5 years	Remarks
Man Power				
Horticulture Extension Officers	500	30,000	90	There is every need to recruit HO's and HEOs for effective transfer to Technology to Horticulture farming community
Horticulture Officers	100	70,000	42	
		Total	132	
University Strengthening				
SKLTGHU: UNIVERSITY			100	For establishing 4 research stations and strengthening of existing research stations. Capacity building to horticultural officers
Marketing				
Sale of fruits and vegetables in the market yards with cold storage			30	Market yards with cold storage will boost the marketing of the vegetables
Market intelligence and FPO Training			10	Market Intelligence is need of the hour for better price discovery Training to FPOs increase the efficiency
Export				
Integrated Pack house along with Irradiation unit, Vapour heat treatment unit, transport			35	The establishment of integrated pack house near Airport will boost Exports.
		Total	75	1863.90 - 942.50 = 921.40



Year-wise Budget Requirement for 5 years (Rs. in crores)

Sr. No.	Particulars	Year I	Year II	Year III	Year IV	Year V	Total
1	Farm Mechanization	40.00	20.60	20.60	20.60	20.60	122.40
2	Other Inputs Subsidy	100.00	98.00	98.00	98.00	98.00	492.00
3	Man Power in Dept of Horticulture	26.40	26.40	26.40	26.40	26.40	132.00
4	SKLTGHU	20.00	20.00	20.00	20.00	20.00	100.00
5	Marketing and Export	67.00	2.00	2.00	2.00	2.00	75.00
	Total	253.40	167.00	167.00	167.00	167.00	921.40

This is in addition to Rs 942.50 crores in five years for drip irrigation which can be tapped from NABARD funds /loan



Returns on Investment

Potential Returns from Horticulture Sector in Telangana

Strategy	Anticipated Returns
Increasing productivity in the existing area	Rs 1341 crores of anticipated returns if the technologies developed by SKLTGHU are implemented in the existing fruit crops area.
Area expansion	Area expansion of fruits (1.32 lakhs acres) and vegetables (2.45 lakhs acres) will further increase the anticipated returns on investment in the ratio of 1:4

Area Expansion

Area expansion of fruits (1.32 lakhs acres) and vegetables (2.45 lakhs acres) by 2030 will increase the anticipated returns on investment in the ratio of 1:4 with an estimated investment of Rs 614.40 crores towards inputs, Rs 132.00 crores for the Department of Horticulture, Rs 100.00 crores for the horticultural university and 942.50 towards drip irrigation with the involvement of Department of Horticulture, SKLTGHU, NABARD, FPOs and other groups.

An investment of 253.4 crores in a year in horticulture sector will add an anticipated returns of 1341 crores. Further, this investment of 253.4 can be tapped from Central and State subsidy schemes.

Increasing the productivity by adoption of available technologies

The returns on increasing productivity with the adoption of best management practices in fruit crops will be Rs 1341 crores with the involvement of Department of Horticulture, SKLTGHU, FPOs and other groups.



Crop	Present productivity (t/acre)	Potential Productivity (t/acre)	Area to be implemented Acres	Anticipated Returns (Rs in crores)
Mango	3.5	5.0	200000	1200
Guava	8.0	10.0	10000	76
Sweet orange	8.0	10.0	20000	60
Pomegranate	4.0	5.0	1000	5
Total			231000	1341*

Marketing and Export

Investment of Rs 75.00 crores by the Government of Telangana in addition to tapping of funds from Ministry of food processing and other schemes of GoI will give anticipated returns on investment in the ratio of 1:3 with the involvement of Department of Horticulture, Department of Agricultural Marketing, APEDA, Ministry of food processing, FPOs, start ups and other groups.



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Annexures



I. Views and Suggestions by the Expert Members

Dr. S. D. Shikamany, Ex Vice-Chancellor, APHU/ Dr. YSRHU

- ✓ There is vast scope for development of horticulture in Telanagana. Due to bifurcation of state and also university, the staff is inadequate in the university and the Department of Horticulture and there is an urgent need for the strengthening of human resources in the University. The student staff ratio in colleges or educational institutions should be 12:1
- ✓ Coaching for the students should be given to achieve good positions at State, National and international levels
- ✓ The research should prioritise based on relevance and need of the state
- ✓ SWOT analysis need to be conducted and while capitalizing the strengths, plan to over-come weakness
- ✓ The out-put of the basic research should be an input for applied research programs
- ✓ Field research is also important as lab research and sufficient experimental land is to be allocated for research
- ✓ What is precision farming is to be well defined and strengthen research on drone technology, image analysis, sensors for nutrient deficiency and water availability In precision farming, the efficiency of inputs should be increased for maximum production per unit input
- ✓ Research on Post harvest technology is to be strengthened for developing sufficient and required technologies and quality standards for the export of mango and grapes
- ✓ Emphasis should be given on export promotion and import substitution. He suggested for research on quality promotion, shelf life, storage and post-harvest handling, pesticide free/food safety, dissipation rate and maximum residual levels (MRLs) of new molecules
- ✓ Effect of climate on pest and diseases needs to be studied



- ✓ Research should be focused on fertilizer use efficiency, customised fertilizer application, insecticide use efficacy by working on demand and time schedule, disease prediction models
- ✓ Regarding the implementation of the plan and marketability of the produce involvement of FPO's, FCO's may be explored
- ✓ Identification of crops and varieties on cluster approach is required
- ✓ Suitability of the varieties in different regions should be identified after testing
- ✓ Round the year production of onion and tomato should be encouraged for year-round supply
- ✓ Low-cost greenhouse technology, climate control structures, simple cost-effective storage structures in field should be designed, standardised and customised as done in Maharashtra for onion
- ✓ Coaching centre or classes for SRF, JRF
- ✓ Coaching center for SC and ST students

Dr. Y. N. Reddy, Professor (Retd), ANGRAU

- ✓ Telangana state is strategically located for cultivation of various horticultural crops including mango
- ✓ There is a need for Preponement of mango flowering and availability of fruits in February/March in Telangana to meet the unreason demand and exports
- ✓ Studies on post-harvest technology need to be strengthened by convergence of scientists research with student research
- ✓ While recruiting the teaching faculty in the University, candidates with knowledge and experience on post-harvest technology may be considered
- ✓ Induction of flowering with PGPR's should be explored
- ✓ Medicinal plants like Ashwagandha has some market demand and need to be promoted in dry regions to meet the demand and industries to use these plants are to be expanded
- ✓ In order to increase the area under grape, wine varieties should be promoted and wine policy should be prepared for the state



Dr. B. Neeraja Prabhakar Ex-Vice Chancellor, SKLTGHU

- ✓ Sufficient quality planting material of citrus species (Sweet orange, acid lime) need to be produced by the university to meet the demand of the farmers of the state
- ✓ Area expansion under grape need to be promoted and wine need to be identified as an health drink and to be incorporated as an health drink. The wine policy need to be finalised by Government of Telangana
- ✓ Suitability of Avocado in different agro climatic regions of Telangana need to be tested
- ✓ Inter cropping of vegetables in oil palm to be popularised
- ✓ Kharif onion cultivation should be promoted in light soils
- ✓ Research on under exploited vegetables like teasel gourd, spine gourd and parwal
- ✓ Research on potato should be initiated
- ✓ Research on Value addition in tuber crops like sweet potato
- ✓ Aflatoxin free chilli cultivation need to be popularised
- ✓ Seed production should be taken up in large scale in the crops like amaranthus, brinjal and beans where university varieties are available
- ✓ Under integrated farming system, flowers and vegetables should be promoted on bunds of rice
- ✓ Efforts should be put to get sanction of more KVKs
- ✓ Transfer of the technology on farm mechanisation in turmeric
- ✓ Explore the potentiality of banana cultivation in Telangana

Dr. I. Prabhakar Reddy, Principal Scientist (Retd.), ANGRAU

- ✓ Scope for revival of grape cultivation in Telangana
- ✓ Popularize 3:1 (Turmeric: Maize) intercropping for the management of soft rot in turmeric
- ✓ Spine gourd germplasm collection may be done from West Godavari District and promotion of spine gourd/pointed gourd/parwal in Telangana
- ✓ Advised for the establishment of extraction units for oil palm. Demand based crops should be encouraged



- ✓ Elephant foot yam as an intercrop in banana crop and cocoa in oil palm may be popularized
- ✓ Identification of areas for off season production of vegetables to arrange for supply of vegetables in metropolitan cities of Hyderabad and Secunderabad
- ✓ INM,IPM, fertigation in all the vegetable crops may be popularised
- ✓ Scientific studies are to be conducted on natural farming and organic farming and standardize protocols
- ✓ Economic support for construction of ponds for area expansion, and quality production
- ✓ Processing of vegetables like green peas, bhendi and tomato
- ✓ Processing of pomegranate
- ✓ Studies on water management area expansion through sprinklers and drip irrigation
- ✓ Government support to drip irrigation
- ✓ Opportunities for area expansion under dragon fruit and dates in Telangana.
- ✓ Medicinal and aromatic plants viz., alovera and ashwagandha production and marketing startups
- ✓ Studies on minor forest fruit trees viz., wood apple, palmyra, date

Dr. B. Bhaskar Reddy, Director (IP), (Retd.), ANGRAU

- ✓ Teaching, research and extension need to be strengthened in the University
- ✓ University products in terms of learned students will not be upto mark without good faculty hence there should be academic competency among the faculty
- ✓ Participatory research be taken up in addition to experimental station research to have good and quick results
- ✓ Problem oriented and need based research may be focused
- ✓ Front line demonstrations may be conducted as part of extension activities
- ✓ Efficient crop zones may be identified based on climate and ecology
- ✓ Bottlenecks in the export of mango, may be identified



- ✓ Integrated packing protocols may be developed for mango and other crops for full capacity and round the year utilisation
- ✓ Suitability of climate for oil palm cultivation in Telangana may be studied
- ✓ The scientists should work in close coordination with the Department of Horticulture, Govt. of Telangana and APEDA

Dr. V. Madhava Reddy, Principal Scientist (Retd),

- ✓ Monitor the micro climate inside the canopy of oil palm in the farmers field (Temperatures, humidity etc.), leaf nutrient levels in the farmers fields to serve as an advisory for oil palm
- ✓ Some basic studies to monitor growth and development of the oil palm crop may be initiated with the available indigenous and exotic planting material to serve as exhibition plots
- ✓ Water requirement and economic yield studies to be taken up in oil palm. Multiple regression analysis can be taken up with the data from the farmers fields

Dr. L. Jalapathi Rao, Former Registrar, ANGRAU

- ✓ Area expansion under different crops may be recommended based on the availability of water and need of the crop in that area
- ✓ The rice/ paddy should be discouraged in the second season and the university may suggest suitable horticulture crops for paddy fields
- ✓ Research on rainfed horticulture may be initiated
- ✓ Production of quality seed and planting material should be taken up on priority basis
- ✓ Outreach of technologies should be increased by organizing farmers training programs
- ✓ Recommendations on management of black thrips in chilli may be popularized and a project may be submitted to Government of Telangana
- ✓ Monitoring of soils for nutrient availability by sensors and pesticide residues by lab analysis to be taken up
- ✓ Stabilize the production of existing crops rather than introduction of new crops.



- ✓ Banana area expansion can be done by substituting rice area
- ✓ Strengthen turmeric research station and the research
- ✓ Very high and imbalanced use of fertilizers is to be discouraged
- ✓ On farm research can be taken up for ultra density cropping in mango, custard apple and guava

Dr. Pamidi Venkateswarlu, Horticulturist, (Retd.)

- ✓ Focus should be on mechanization
- ✓ Impact assessment should be done based on area under technology adoption
- ✓ Crop museum should be maintained with off season crops in the controlled environment in all research stations
- ✓ Benefit cost ratios should be worked out
- ✓ Research should be in line with industrial requirement and university industry linkages to be strengthened
- ✓ Use of bios in chilli should be discouraged as in reality these products rarely has any microorganisms but its only a mixture of nutrients and PGPRs
- ✓ Experiments in farmers field may be taken up to study fertilizer and residue studies
- ✓ Explore on value addition and cost addition
- ✓ Focus on breeder seed and nucleus seed production
- ✓ Research data should be there before introducing new crops
- ✓ Every faculty should have exposure in teaching, research and extension

Dr. R. Srihari Babu, Principal Scientist, (Retd.), ANGRAU

- ✓ Explore under exploited crops (Kasara kaya- *Mimorica tuberosa*) and chitti kakara.
- ✓ Moringa need to be encouraged as not only for the fruits but leaves have huge advantages both nutrient and medicinal properties
- ✓ Kadium type of nurseries are to be developed
- ✓ Villages need to be identified for seed production of all crops



Dr. Syed Ismail, Former Associate Dean, COH, Mojerla

- ✓ Explore the possibility of establishment of College of Food Science and Technology
- ✓ Under rainfed horticulture, medicinal and aromatic plants like Aloe vera and vinca rosea may be promoted

Dr. B. Srinivas Rao, Retired Principal Scientist (Hort.)

- ✓ Promotion of parwal, pointed gourd (Three varieties Elite selection-1, Swarna Rekha, Swarna Aloukhi) in Telanagana with ring method of propagation
- ✓ In drylands, cucumber, ridge gourd, okra and cluster beans can be promoted as inter crops in Red gram and Castor
- ✓ Under rainfed horticulture, amla, sitaphal, soap nut may be encouraged
- ✓ For early flowering in mango, alternate chemicals/ substitute for paclobutrazol (cultural) may be tested as cultural may lead to deterioration of mango trees

Dr. K. Chandrasekhar Reddy, Retired Professor (Hort.)

- ✓ Recruitment of staff should be priority
- ✓ Strengthening of research stations may be taken up

Sri. Bandi Venkateshwar Rao, Retired Professor (Hort.)

- ✓ Suggested to collect custard apple germplasm from Rajahmundry and other minor fruit crop (jamun) and medicinal plants like thani, thapsi and shikakai germplasm from Rampachodavaram and Chintappally

Dr. A. Manohar Rao, Retired Senior Professor (Hort.) and Ex-Board Member of PJTAU

- ✓ Establishment of skill centres in the university to impart skills to the rural youth
- ✓ Create awareness in the government about the knowledge, skills and potentiality of the students of the university and see that they get employment in the state and their services are taken up in various schemes run by the Department and Government agencies



- ✓ Impact of the technologies has to be studied
- ✓ A centre of excellence has to be established in the University for the Post Graduate research and PG research should be strengthened
- ✓ University should have a memorandum of understanding with agro industries and national institutes to collaborate research in relation to smart agriculture, crop modelling and AI
- ✓ A centre on Organic Horticulture should be established
- ✓ Pesticide residue lab needs to be established
- ✓ Research on market intelligence, weather based forecasting, hydroponics should be done to generate the data
- ✓ Success stories should be well documented and popularized.
- ✓ Weather based agro bulletins to be released

Dr. M. Padma, Former Dean of PG Studies, SKLTGHU

- ✓ Quality planting material and seed material of the mandate crops from the respective stations need to be produced
- ✓ Breeder seed production should be taken up
- ✓ Seed multiplication of medicinal and aromatic plants has to be strengthened
- ✓ The University should work on medicinal plants (Ashwagandha, Aloe vera, Sarpagandha, Nannari) and aromatic plants (lemon grass, citronella and palma rosa) in coordination with CIMAP
- ✓ Aromatic plants need to be encouraged in a big way as there is huge demand
- ✓ Government should assist in establishment of extraction units
- ✓ Training programmes has to be organised regularly

Dr. M. Raj Kumar, Former Director of Research, SKLTGHU

- ✓ In view of shifting of MAPRS station from herbal garden to COH, Rajendranagar, the seed material of tree species may be collected and planted in the newly allotted area



- ✓ Studies on processing and value addition in medicinal and aromatic plants may be taken up
- ✓ Best performing Jamun varieties at FRS, Sangareddy may be promoted

**Dr. K. Veeranjanyulu, Former University Librarian
and Professor, PJTSAU**

- ✓ For a good NIRF ranking, research productivity should be increased
- ✓ Externally funded projects, consultancy, patents should be increased
- ✓ Alumni associations, skill centres should be started
- ✓ Proposals for MOOC's courses on fruits and vegetables should be taken up
- ✓ Programs on Internet of Things, drones, artificial intelligence, virtual reality, augmented reality should be taken up
- ✓ Coaching centre or classes for SRF, JRF should be there in the university
- ✓ Certified courses like Digital marketing, Post harvest technology, Development of Expert system, Remote services to be initiated

Dr. Vinod Kulkarni, Pr. Scientist (Retd), ANGRAU

- ✓ In all horticultural crops particularly mango soil test based, leaf analysis test based fertilizer doses are to be followed
- ✓ Before recommending any technology, it should have scientific background like what are the contributing factors for yield/quality improvement
- ✓ There should be strong industry and farmers linkage
- ✓ Assessing different parameters in high density mango like light interception, pest incidence, flowering pattern, increased canopy and pruning strategies
- ✓ Standardise combination of Paclobutrazol and pruning in high density planting
- ✓ Research on Paclobutrazol in getting early maturity need to be studied
- ✓ Illegal use of carbide application for early ripening has to be avoided
- ✓ Blending of banganapalli with alphonso/Panchadhara kalasa may be tried for good nectar/juice



- ✓ Introduction of alphonso in Telangana may be studied. Studies to be taken up at FRS, Sanga Reddy on improving the quality of fruits
- ✓ Export should be market targeted
- ✓ Germplasm available at national level in all the institutes have to be collected, conserved, maintained and evaluated
- ✓ Need to develop good quality guava by crossing seedless guava with good available variety
- ✓ Studies on low sugar varieties in mango to be initiated

Concluding Remarks by

Dr. D. Raji Reddy, Vice-Chancellor, SKLTGHU

- ✓ Education, Research and Extension in the university will be strengthened
- ✓ The existing technologies generated by the University will be transferred to the farmers
- ✓ The students will be sensitised to do research in farmer's field
- ✓ The existing labs in Mulugu will be strengthened with GI and other facilities
- ✓ Collaborative work with NGO's will be initiated
- ✓ An MOU was signed with C-DAC for sensor based research and MOUs will be signed with Engineering Universities/Institutions for collaborative research on Automation and Robotics in Horticulture
- ✓ Research on Speed Breeding, Hydroponics and Aeroponics will be taken up.
- ✓ Hybrid development programs in vegetables will be taken up. Release of tomato variety in two years will be taken up as a challenge
- ✓ Kisan melas will be conducted in all the zones of the state and the success in Punjab and Karnataka where lakhs of farmers attend Kisan Melas has to be replicated in Telangana
- ✓ Each research station will have model blocks/farms depicting different crops and seed multiplication will be taken up



- ✓ WhatsApp groups have to be created for different crops for the benefit of farming community
- ✓ Farm Mechanization will be given top priority
- ✓ Post harvest research studies will be taken up in a big way
- ✓ Microbial pesticide lab will be established
- ✓ Agricultural Engineering College will be established in Hyderabad with food science and technology as one department
- ✓ Initiation for PG diploma course will be done
- ✓ A drone academy will be established in Rajendranagar
- ✓ A model farm will be established at Kotyal village near Mulugu
- ✓ As Telangana Chapter in Hyderabad (Regional Chapter) was started, university shall plan to conduct national level conference shortly under the Society

The meeting ended with the Vote of Thanks by Dr. M. Rajashekar, Dean of Horticulture, SKLTGHU, Mulugu



List of Experts in different fields of horticulture participated in the meeting.

1. Dr. S.D. Shikhamany, Former Vice Chancellor, APHU
2. Dr. Y. N. Reddy, Retired Emeritus Professor, ANGRAU
3. Dr. B. Neeraja Prabhakar, Former Vice Chancellor, SKLTGHU
4. Dr. I. Prabhakar Reddy, Retired Professor (Hort.), ANGRAU
5. Dr. B. Bhaskar Reddy, Former Director (International Programme), ANGRAU
6. Dr. L. Jalapathi Rao, Former Registrar, ANGRAU
7. Dr Pamidi Venkateswarlu, Horticulturist (Retd)
8. Dr. V. Madhava Reddy, Retired Principal Scientist (Oil Palm)
9. Dr. R. Srihari babu, Retired Professor (Hort.), ANGRAU
10. Dr. Syed Ismail, Former Associate Dean, COH, Mojerla
11. Dr. B. Srinivas Rao, Retired Principal Scientist (Hort.)
12. Dr. K. Chandrasekhar Reddy, Retired Professor (Hort.)
13. Sri. Bandi Venkateshwar Rao, Retired Professor (Hort.)
14. Dr. A. Manohar Rao, Retired Senior Professor (Hort.) and Ex-Board Member of PJTAU
15. Dr. M. Padma, Former Dean of PG Studies, SKLTGHU
16. Dr. M. Raj Kumar, Former Director of Research, SKLTGHU
17. Dr. Vinod Kulkarni , Pr.Scientist (Retd), ANGRAU



II. Proceedings of the Group Meeting with Research and Extension Council (REC) Members

The meeting was held on 28.2.2025 at administrative office, SKLTGHU, Mulugu under the chairmanship of Dr. D. Raji Reddy, Vice-Chancellor, SKLTGHU.

The program started with lighting of the lamp followed by University song. Dr. A. Bhagwan, Registrar, SKLTGHU extended a warm welcome to the officials from the Department of Agricultural Marketing, Department of Horticulture, Telangana Seed Certification Agency, APEDA, REC members in the category of eminent scientists, progressive farmers, Innovative farmers, women farmers, representatives of agribusiness consortium, University Officers, Associate Deans, Heads of the research stations, Programme Coordinator of KVK and all other scientists of the university to the first REC meeting, SKLTGHU.

Dr. D. Raji Reddy, Vice-Chancellor, SKLTGHU, Chairman of the programme in his opening remarks stated that the concerns / constraints in horticulture expressed by the participants in this meeting would be taken into consideration in formulating the action plan for the research and extension programmes in the ensuing years.

The meeting helps in identifying research and extension gaps and prepare the future research and extension agenda. The university has developed good technologies and all the departments should work together to transfer these technologies to the farmers.

He further stated that Hon'ble Chief Minister's convened a meeting with all the Vice Chancellors in the state of Telangana to discuss the status of the universities and suggested to prepare a perspective and vision plan for their respective universities in Telangana which has to be presented to the Hon'ble Chief Minister.

Accordingly, the university has prepared a draft perspective plan for horticulture development in Telangana and to strengthen the teaching, research and extension programmes of SKLTGHU. The inputs from REC members will be taken into



consideration in the preparation of road map for the development of the horticulture sector in Telangana.

Dr. A. Bhagwan, Registrar, SKLTGHU presented the present status and the draft perspective plan for the university and Research Highlights for the year 2023-24. Dr. D. Vijaya, DE, SKLTGHU presented extension highlights for 2023-24.

Smt. G. Lakshmi Bai, Director of Agricultural Marketing, Govt. of Telangana enquired about the onion varieties ready for minikits and their suitability to Telangana, shelf life and pungency for acceptability by the consumers. It was decided to make efforts to bring these varieties to the farmers by taking up minikits and FLDs depending on the availability of seed.

(Action: SKLTGHU, Department of Horticulture, Directorate of Agricultural Marketing).

Smt. G. Lakshmi Bai also enquired about the low cost storage structures for onion.

Dr. D. Anitha Kumari, Principal scientist and Head, Vegetables Research station responded that low-cost storage structures are available with ICAR-Directorate of Onion and Garlic Research, Pune which may be replicated.

(Action: SKLTGHU, Department of Horticulture, Directorate of Agricultural Marketing)

Dr. G. Sangeetha Laxmi, JD Horticulture/DHSO, Warangal Department of Horticulture, Telangana

Research and extension required in the below mentioned areas:

- Malformation in mango
- Assessment of the impact of paclobutrazol usage
- Standardization of fruit bagging techniques in mango for export
- Standard protocols for export of different fruits
- Blackening of fruits in Banana



- Standardized protocol for fruit bagging in banana, export is needed
- Fruit rot in custard apple
- Fruit fly and tea mosquito management in Guava
- Suitable varieties in Avocado
- Quality planting material is needed for Avocado, Jamun, and Jackfruit
- Suitability studies on cultivation of Macadamia nut in Telangana
- Guidelines for cultivation of various vegetable crops for different seasons and market intelligence
- Farmer-friendly storage techniques for Onion and Potato
- Rotting in Chapata chilli
- Need to standardize fertilization schedule for Chapata chili
- Leaf spot disease in turmeric
- Value addition in ginger
- High cost of marigold seeds
- Kitchen garden vegetable kits should be supplied to primary schools for practical experience

Smt. G. Suvarna, DD Horticulture/ DHSO, Siddipet District, Department of Horticulture, Telangana

- As many farmers are interested in Avocado farming and Indian varieties have lower oil content; suitable varieties for Telangana need to be recommended. Availability of planting material has to be concentrated
- Frontline Demonstrations (FLDs) can be planned for Macadamia nut cultivation.
- Approximately 12,000 acres of oil palm is cultivated in Siddipet. In view of this suitable intercrops need to be identified and recommended
- A plan for area expansion of cocoa cultivation in Aswaraopet should be developed.
- Proper strategies need to be developed to improve productivity and profitability in cultivating sericulture after paddy



Smt. G. Lakshmi Bai, Director of Agriculture Marketing, Government of Telangana

- Proposals for the release of best DOGR (Pune) tested onion varieties at VRS Rajendranagar should be done
- Pungent varieties should be prioritized based on farmer preferences.
- Arrangement for supply of onion seeds to the farmers from DOGR (Directorate of Onion and Garlic Research) should be done
- In Zaheerabad, Potato prices drop significantly when supply increases in the market as most of the potatoes come from Maharashtra. Hence strategies to be worked out for increased price of local produce
- Similarly, for carrot also, local supply has less demand compared to carrot varieties received from other states saying the carrot and potato grown in Telangana are not of good quality which is to be investigated
- Ginger productivity is not satisfactory and the reasons need to be explored.
- A comparative study on the quality of ginger, potato, and carrot between local and other state varieties is required
- Pesticide application in Chilli is excessive, leading to a high number of export rejections even from gulf countries. Chilli thrips has become a major problem in recent years
- Significant variations in the "Teja" variety have been observed. Need clarification on original Teja characters
- Research is required on pedal-operated devices for turmeric processing. Machines or technologies for drying raw turmeric care required
- Turmeric digger need to be popularized
- Practical challenges in converting agricultural waste to energy needs to be explored and feed back and sustainable research is required
- Fundamental price analysis is needed for price variations in chilli, turmeric, and other vegetables

Reacting to the observations, Vice Chancellor stressed that IPM technology is available for chilli thrips and large scale demonstrations are required for management of chilli thrips in Warangal and Khammam districts. A letter is to be



addressed to Commissioner, Horticulture on the recommendations for chilli thrips management. As control of black thrips is to be initiated from the crop beginning stage, immediate action plan is to be prepared for demonstrations on management of chilli thrips with active involvement from the Department of Horticulture. Action plan for black thrips management in chilli, should be prepared within 15 days

It is also decided to bring the varieties tested at VRS, SKLTGHU in seed chain by releasing from State Varietal Release Committee for large scale multiplication

- Genuine bio-pesticides must be evaluated and restrictions are required for the use of bios, All the research stations are to be involved and action plan is to be prepared
- Need to establish a dedicated marketing cell with retired economists and logistics experts for market related logistics. Strengthening market intelligence is required to enhance price stability and market access
- There is need to develop a round-the-year vegetable cultivation calendar for farmers. Self-sufficiency in vegetable at village level is required and the university has developed action plan for area expansion in vegetables. For every 50Km one Government Market yard to be developed and dedicated cell is required
- Discourage the influx of vegetables from other states to promote local self-sufficiency
- Cost-Benefit Analysis: Need to analyze the cost-benefit ratio of local varieties versus hybrids

Dr. V. Prudhvi Raj, Seed Certification Officer, Telangana seed certification agency

- Government-notified seeds need certification to ensure quality assurance for farmers
- University should focus on breeder seed production in vegetable crops.
- Onion, chilli, and bhendi seed production requires support from universities
- Collaboration between universities and the Department of Horticulture and seed certification agency is essential to enhance truthfully labelled public seed production



Vice Chancellor has suggested that Parental lines may be taken from IIHR, Bangalore and ICAR-Indian Institute of *Vegetable Research, Varanasi*, for large scale seed production in vegetables

Mr. Shaik Abdul Khadar Basha, BDM, APEDA

- Telangana requires Pack house and irradiation facilities for export of quality mango produce
- An integrated pack house is under process of establishment within a year.
- Good Agricultural Practices (GAP) certification can help in reducing export rejections
- Capacity Building Programs (CBP) should be conducted to educate farmers on export standards
- Banned pesticide usage must be addressed through collaborative efforts by NIPHM, APEDA, and the Horticulture Department via CBP programs. Most export rejections are due to high residue levels. For this farmer awareness programs on banned pesticide and the time of pesticide usage is essential
- APEDA provides a 75% subsidy on cold storage units worth ₹2 crore
- Subsidies are also available for processing facilities, which should be promoted for better utilization. Regular awareness are required on this aspect

Vice Chancellor responded that university is ready to Collaborate with APEDA in Capacity Building Programs in horticulture

Sri. Anil Kumar V. Epur, Director, AG Hub Foundation, Hyderabad.

- The impact of climate change on crops and the farming community needs in-depth study
- Need to develop climate resilient/ resistant varieties.
- Due to long gestation period for horticultural crops, protocols for intercropping in horticultural crops should be developed to get income in the initial stages



- The effect of high soil temperatures and evaporation must be analyzed and recommend crops and technologies to minimize losses
- Integration of solar power in agriculture is required
- The area under protected agriculture (greenhouses/polyhouses) should be increased
- Farm mechanization studies should be conducted for each crop
- Research on automated and semi-automated technologies is needed
- How to recommend high density cropping suitable for tractor
- Soil sensors and fertilization sensors should be made compulsory for crop loans.
- Battery-operated machines for turmeric should be explored
- Suitability of crops in mixed orchards with border crops and intercrops require detailed study
- Value addition in crops should be encouraged to improve profitability
- Mobile apps for crop management can be developed
- Farmers should be educated online on best practices
- Awareness and access to crop insurance should be improved
- Roof gardens and hydroponics for households should be promoted with proper training
- Dedicated crop varieties should be developed to meet consumer acceptance and export standards
- Market demand in different crops need to be studied
- A study on seasonality and action plan to meet the demand in lean period in vegetables is required. Off season production of vegetables and identification of areas is to be focussed

Sri. Chintala Venkat Reddy, Progressive farmer

- **Banned pesticides** must be strictly regulated
- **Natural alternatives** should be explored and evaluated for viability
- **Subsoil effects on growth, yield and pest management** in different horticultural crops need to be evaluated through research



Sri. Alapati Ramachandra Prasad-Oil Palm Association President & Progressive Farmer

- Oil palm plantations began in 1993, but Ganoderma has become a major issue, affecting both old and young orchards (10-15 years). Effective Ganoderma management is crucial, and Pseudomonas-based control has been suggested. A systematic approach for managing Ganoderma and Bunch rot is required
- Seed Quality & Quarantine: Concerns exist regarding the effectiveness of seed quarantine processes which need to be streamlined
- The Horticulture Department should take responsibility for supply of good quality seedling of oil palm to farmers. Quarantine regulations for oil palm seed material should be made compulsory and enforced by both Department of Horticulture and Universities
- A minimum 9m x 9m square planting system is most suitable for oil palm and should be officially recommended to farmers
- Research is needed on intercropping of Arecanut plantations with oil palm to provide correct recommendation
- Micro nutrients; Boron (B) and Magnesium (Mg) deficiencies have been observed in oil palm plantations. Mandatory application of Mg and B should be ensured by the Telangana Government. Sulphur and gypsum should be made easily available to farmers through the Horticulture Department
- Soil testing in oil palm should be widely promoted to ensure better nutrient management
- Suitable intercrops for oil palm should be recommended to farmers based on market feasibility and profitability
- Market stability for oil palm is essential to ensure farmer profitability

Sri. G. Nagarathnam Naidu- Abdullapuram, Progressive Farmer

- Natural farming is gaining importance and needs further promotion
- Utilizing waste land for cultivation is important for increasing arable land. Converting wasteland into sustainable farming should be a priority for long-term agricultural growth



- Floriculture development is lagging, though it offers high-income potential for farmers
- Mixed farming/integrated farming is a key strategy to double farmers' income by ensuring diversified revenue streams

Sri. Jaipal Reddy, Mahbubabad, Progressive Farmer

- Crop diversification should be encouraged to enhance farmer income and sustainability
- Monkey menace needs effective control measures to protect crops and reduce losses
- Growing vegetables under solar panels need to be tested
- Suitability of coriander, fenugreek, cumin and caraway seeds to Telangana need to be tested

Sri. N. Narasimha Reddy, Nalgonda, Progressive Farmer

- Market fluctuations remain a major issue for farmers
- Value addition should be promoted to enhance profitability
- Pest management is crucial for sustainable production
- Nursery management practices need improvement for better-quality seedlings
- Manpower costs are increasing, and alternative solutions must be explored
- Farm mechanization needs to be popularised
- Cost of cultivation including manure expenses, should be analyzed and optimized
- Horticulture and agribusiness should be integrated for better market linkage
- Polytechnic students should receive hands-on training. They should also motivate and train farmers to improve agricultural practices
- Polyhouse cultivation should be encouraged for high-value crops
- The current status of food parks in the state needs assessment
- Drip facility to be extended to all horticultural crops
- Solar energy and biochar applications should be explored in farming



- National Horticulture Mission, Universities, and the Horticulture Department must collaborate for better impact
- Lab analysis should be simplified and made accessible at the field level
- Tamil Nadu has developed cluster-based value addition centers. A similar proposal should be initiated in Telangana state
- Reduce the existing market fees
- Role of intermediaries in marketing should be minimized/regularised
- Institutional consumption need to be promoted

Sri. Rama Rao, Nalgonda, Progressive Farmer

- Agricultural technologies need to be effectively disseminated to farmers
- Many ground-level farmers lack awareness about the proper use and time of application of pesticides. Information pamphlets should be made available at mandal level
- The area under sweet orange, guava, and pomegranate in Nalgonda has significantly decreased. Efforts to improve area expansion must be done
- Oil palm can be cultivated at a lower cost with the right management practices
- Farmers should be advised on suitable intercrops for horticultural perennial crops to maximize land use and income
- Detailed studies on organic cultivation are required to assess feasibility, benefits, and challenges

Dr. A.S. Subba Rao, Senior Manager, Netafim, India, Agribusiness consortium

- PPP mode should be encouraged to enhance investment and efficiency in farming
- Lab-to-land approach must be implemented for Technology Transfer and to ensure reach of research results to farmers
- Farmer ambassadors should be prepared to lead knowledge-sharing initiatives
- Risk-free farming should be promoted by adopting cost-effective methods
- Strategies must focus on reducing the cost of cultivation and maximizing farmer income



- Research is needed to identify precautionary measures for insect detection at an early stage (<5-10% infestation)
- Technology dissemination in adopted villages should be prioritized to create model agricultural communities
- Extension activities need to be strengthened for better farmer outreach
- Suitable intercrops in oil palm must be identified and recommended
- Collaboration in capacity building and farmer training should be enhanced for effective knowledge transfer

Dr. M. Parasuramaiah, Sr. DGM, Dhanuka Pvt Ltd, Agribusiness consortium

- Natural and organic farming should be promoted to ensure long-term food security
- The use of pesticides in India is less @ 300-400 g per acre compared to other countries
- Noxious weeds in tomato are difficult to control physically, mechanically, or chemically. Post-emergence herbicide Halo Sulfuron Methyl (36 g/acre) is effective in tomato need to be publicised
- Advanced herbicide research should be conducted by PG students for better weed management solutions
- Farmers find difficult to identify fungal and bacterial diseases in crops. Hence Plant-based Fungicides for disease control should be evaluated in the universities
- A collaborative approach (PPP model) should be implemented for better plant protection strategies
- Strategies must be developed to preserve organic carbon in the soil for sustainable farming. Subsidised green manure crop seeds distribution need to be enhanced
- Farmers lack awareness on pre-harvest intervals (PHI) in pesticide use, which needs to be addressed
- Social media should be leveraged effectively to educate farmers on modern practices
- India has 193 lakh acres of agricultural land, largely covered by paddy and cotton. Crop diversification should be encouraged for sustainability



Smt. K. Renuka Raju, Hyderabad, Women progressive Farmer

- To encourage schools to integrate lessons on the nutritional benefits of horticultural crops into their curriculum
- To organize campaigns on tree planting, composting, and kitchen gardening to foster hands-on learning and cultivate an interest in horticulture among young students
- To promote horticulture education among school students to enhance their understanding of nutritional security and sustainable agriculture practices
- Starting of a nutrition garden in every school premises

Concluding Remarks by

Dr. D. Raji Reddy, Hon'ble Vice Chancellor, SKLTGHU

- For strengthening Oil Palm Research, nursery inspection by quarantine team with the Department of Horticulture is required
- Need to conduct surveys in oil palm plantations and take up on farm studies to assess suitable intercrops
- Need to develop integrated cropping systems integrating horticulture with agricultural crops for sustainability and income
- Strategies are needed to mitigate climate, technological, and market risks in horticulture. Technological interventions should be prioritized to combat climate change
- There is high potential for organic farming in horticulture crops. Farmers need guidance on adopting technologies effectively. Every stakeholder must play a proactive role in technology dissemination
- Need to conduct a large-scale awareness campaign to educate farmers on best management practices

The meeting concluded with the vote of thanks extended by Dr. T. Suresh Kumar, Principal Scientist and Head, Grape Research station, SKLTGHU



List of Participants

- | | |
|---------------------------|--|
| 1. Dr. D. Raji Reddy | Vice Chancellor, SKLTGHU |
| 2. Dr. A. Bhagwan | Registrar, SKLTGHU |
| 3. Dr. M. Rajasekhar | Dean of Horticulture & DPGS, SKLTGHU |
| 4. Dr. D. Vijaya | DSA & DE, SKLTGHU |
| 5. Dr. N. Seenivasan | COE & DIIP I/C, SKLTGHU |
| 6. Dr. K. Veeranjanyulu | Consultant, SKLTGHU |
| 7. Dr. G. P. Sunandini | Technical Advisor to Vice Chancellor, SKLTGHU |
| 8. Dr. Kiran Kumar | Pr. Scientist & Head, HRS, Konda Malleshpalli |
| 9. Dr. J. Cheena | Associate Dean, COH, Malyal |
| 10. Dr. T. Suresh Kumar | Pr. Scientist (H) & Head, GRS, Rajendranagar |
| 11. Dr. P. Prashanth | Associate Dean, COH, Rajendranagar |
| 12. Dr. D. Anitha Kumari | Pr. Scientist (Ento.) & Head, VRS, Rajendranagar |
| 13. Sri. B. Mahender | Scientist & Head, TRS, Kammarapally |
| 14. Dr. V. Suchithra | Sr. Scientist & Head, FRS, Sangareddy |
| 15. Dr. P. Saidaiah | Associate Dean, COH, Mojerla |
| 16. Dr. V. Murali | Sr. Scientist (Agro) & Head, HRS, Adilabad |
| 17. Dr. Ch. Raja Goud | Sr. Scientist, HRS, Konda Malleshpalli |
| 18. Dr. Veena Joshi | Technical Officer to Vice Chancellor |
| 19. Dr. G. Jyothi | Scientist & Head, FLRS, Rajendranagar |
| 20. Dr. G. Vijaya Krishna | Scientist (H) & Head, HRS, Ashwaraopet |
| 21. Dr. Nagaraju | Scientist (H) & Head, HRS, Malyal |
| 23. Dr. B. Naveen Kumar | Vice Principal, HPT, Ramagirikihilla |
| 24. Smt. V. Krishnaveni | Scientist & Head, MAPRS, Rajendranagar |



Line Departments

- | | | |
|-----|------------------------------|---|
| 1. | Smt. G. Lakshmi Bai | Director of Agricultural Marketing, Govt of Telangana |
| 2. | Dr. V. Prudhvi Raj | Seed Certification Officer |
| 3. | Sri. M. Shiva Kumar | Asst. Director of Seed Certified TGSOCA, Hyd |
| 4. | Sri. A.S. Subba Rao | Sr. Manager, Netafim Pvt Ltd |
| 5. | Dr. M. Parasuramaiah | Sr.DGM, Dhanuka Agritech Pvt. Ltd |
| 6. | Sri. Eshwar Satyarthi | Gromor Nursery |
| 7. | Sri. Anil Kumar V. Epur | Director, AG Hub Foundation Hyderabad |
| 8. | Dr. G. Sangeetha Laxmi | JD Horticulture/DHSO Warangal, Dept. of Horticulture, Govt. of Telangana |
| 9. | Smt. G. Suvarna | DD Horticulture/DHSO, Siddipet, Dept. of Horticulture, Govt. of Telangana |
| 10. | Mr. Shaik Abdul Khadar Basha | BDM, APEDA |

Progressive Farmers

1. Sri. CH. Venkat Reddy, Padmasree, Secunderabad
2. Sri N. Narsimha Reddy, Nalgonda District
3. Sri. M. Rama Rao, Nalgonda District
4. Sri. G. Nagaratnam Naidu, Hyderabad
5. Sri. Jaipal Reddy, Mahabubabad District
6. Sri. A. Rama Chandra Prasad, Mahaboobabad District
7. Smt. K. Renuka Raju, Hyderabad



III. Proceedings of Interaction Meeting with FPOs and Industries on Perspective Plan for the Development of Horticulture in Telangana & SKLTGHU

An Interaction Meeting with FPOs and Industries on “Perspective Plan for The Development of Horticulture in Telangana & SKLTGHU” held on 09-05-2025 at administrative office, SKLTGHU, Mulugu. The programme was presided over by Dr. D. Raji Reddy, Vice-Chancellor, SKLTGHU.

Representatives from FPOs, Industry, officials from Department of Horticulture Scientists from NAARM, University Officers, scientists of SKLTGHU, participated in the meeting. The program commenced with the lighting of the lamp, followed by the University song.

Dr. D. Raji Reddy, Vice-Chancellor, SKLTGHU in his introductory remarks shared that the university is preparing Perspective Plan for Horticulture Development in Telangana and in this process series of interactive meetings were held with renowned researchers, officials of department of horticulture and marketing ,progressive farmers, students and critical inputs and recommendations from these meetings have been documented and incorporated in the Draft Perspective Plan for Horticulture in Telangana.

The primary agenda of this meeting is to present the draft plan prepared by the university and invite suggestions from industry, officials from department of horticulture and Scientists from NAARM.

Dr. Raji Reddy highlighted that though 450 FPOs are existing in Telangana, only 10-15 FPOs are currently active and successful and there is a need to strengthen all the FPOs.

He pointed out that horticulture at present is cultivated in just 12.5 lakh acres in Telangana, contributing nearly 30% to the state's GDP from agriculture. There is no



growth and stagnation in horticulture. Need area expansion with focus on which crop to be promoted and integration of horticulture with agriculture is required for stable income. Need emphasis on market promotion with at least one market for 50 km as per the new marketing policy and post harvest management and processing and value addition. He remembered that in 2015-16 Rs1000/ acre as an incentive helped re expansion of redgram in Telangana.

Following his remarks, Dr. A. Bhagwan, Registrar, SKLTGHU, presented the current status and the Perspective Plan prepared by the university. He emphasized key interventions to boost horticultural productivity, including the promotion of drip irrigation and fertigation in fruit crops (excluding mango and sweet orange), subsidized seed supply to vegetable farmers, mulching, drip irrigation systems, integrated pest management and vegetables on pandals, efficient marketing, market intelligence, cold storage, mechanization, integrated packhouse along with irradiation unit, strengthening the Department of horticulture and the university and stressed that government support in providing these critical inputs for area expansion. To enhance productivity, adoption of the available technologies need to be emphasised.

Views and Suggestions by the Expert Members

Sri. A. Praveen Reddy, President, Mulkanoor Cooperative Society

- ✓ The Department of Horticulture must play a vital role in supporting farmers by ensuring the timely and adequate supply of critical inputs such as quality seeds, mulches. Availability of farm machinery is to be increased.
- ✓ Focus should be on enhancing income per acre and net returns
- ✓ Crop diversification should be actively promoted, particularly by encouraging vegetable and flower crops as second crop after paddy for optimizing land use and income generation.
- ✓ Emphasis should be placed not only on overall production but also on parameters like fruit size and quality grading, which play a crucial role in marketability and export.



- ✓ Grading of small-sized fruits at the collection yards must be strictly implemented, and necessary measures to improve fruit size and quality should be explicitly incorporated into the Package of Practices.
- ✓ Package of practices for all crops need to be provided in the form of information pamphlets.
- ✓ Specific attention should be given to enhance the export potential of crops such as grapes, sapota and pomegranate, particularly targeting Arab, Asian markets, which have comparatively fewer restrictions on imports.
- ✓ Additionally, the Department of Horticulture, Government of Telangana, should consider providing subsidies for packaging materials for mango, citrus, vegetables, and flowers, as packaging plays a critical role in maintaining quality during transportation and meeting export standards. The focus on improving packaging systems and material quality is essential to enhance the market value of horticultural produce.
- ✓ Grading, standardization and quality control must become integral components of the value chain, ensuring Telangana's horticultural produce competes effectively in both domestic and international markets.

Dr. Raji Reddy, Vice Chancellor Remarks

- ✓ It is essential to focus on the selection of suitable varieties, ensuring availability of quality seeds for each crop, and preparing a comprehensive package of practices (PoP) for each crop. These efforts are crucial to encourage farmers to adopt horticultural crops as a second crop, thereby enhancing cropping intensity and farm income.
- ✓ The University will take the lead in preparing a crop-wise seasonal schedule along with the corresponding package of practices, which will be widely disseminated to farmers. This will enable them to take decisions and successfully integrate horticultural crops into their existing cropping systems.

Sri. Manohar Naidu, FPOs, Sweet Orange, Maldakar FPO, Gadwal

- ✓ Efforts are required to strengthen the marketing of sweet orange, export to other states, along with exploring and promoting its export potential to international markets.



Sri. J. Vilas, BBWS FPC LTD, Kumarum Bheem Asifabad district

- ✓ The involvement of middlemen in the marketing channels, particularly for vegetables and fruit crops, needs to be carefully addressed. Currently, farmers are not receiving optimum prices for their produce, as a significant portion of the trade is controlled by wholesalers, who procure the produce from intermediaries rather than directly from the farmers.
- ✓ There is an urgent need to streamline the marketing system to ensure that farmers get fair and remunerative prices by facilitating direct marketing channels and strengthening FPOs.

Sri K. Vinod Kumar, Coordinator, AGEEWA, FPO, Bhongiri

- ✓ Farmers need to be made aware of the importance of vegetable production during the lean period /off season to ensure continuous income and market supply.
- ✓ More emphasis should be placed on conducting on-farm demonstrations to showcase the benefits of new technologies. Farmers are more likely to adopt innovations—whether it is in seed selection, choice of secondary crops, or variety selection—when they witness tangible results in terms of yield and profitability on demonstration plots.

Sri. Lingala Muthyam, AGEEWA, FPO, Bhongiri

- ✓ The Government of Telangana should provide subsidies on critical inputs such as vegetable pandals, quality seeds and drip irrigation systems.
- ✓ These interventions are essential to reduce the initial investment burden on farmers, promote adoption of improved technologies and enhance productivity and profitability in the horticulture sector.

Sri. Appa Rao, Fruit Production Bags, M/S. Fruit Tech Solutions (p) Ltd, West Godavari Dist.

- ✓ The Department of Horticulture, Government of Telangana, started providing subsidies for fruit bags, which play a crucial role in enhancing fruit size, improving quality, and minimizing pest and disease damage, particularly in mango, guava, grapes and pomegranate and should be continued.



- ✓ Greater focus must be placed on promoting the export of horticultural crops, especially mango and banana, by aligning production and post-harvest practices to meet international standards.
- ✓ Farmer awareness programs on the judicious use of pesticides need to be intensified. These should cover aspects such as proper dosage, calculation methods, and correct application techniques, to prevent the indiscriminate use of pesticides, ensuring both food safety and compliance with export standards.
- ✓ Training and capacity-building initiatives should emphasize pesticide residue management and educate farmers on the export potential of horticultural crops, ensuring that their produce meets the required phytosanitary and quality norms of international markets.
- ✓ Awareness on crop regulation and crop load management must be imparted to farmers, highlighting the importance of practices such as fruit pruning, optimum fruit load management, and canopy management, which directly influence fruit size, quality, color, and yield consistency.
- ✓ There is an urgent need to address the issue of monkey menace, which poses a serious threat to horticultural crops, by exploring sustainable and farmer-friendly control measures.

Sri. Shivashankar, Director, PO Kollapur

- ✓ There is a need to promote and encourage the establishment of low-cost ripening chambers within the state to ensure safe and uniform ripening of fruits, reducing post-harvest losses and enhancing market value.
- ✓ Planting 5-6 mango trees along the borders of the farms can act as a natural barrier to partially mitigate monkey menace, providing some level of protection to the main crops.

Dr. Shanabhoga, Senior BDM, NAARM, Rajendranger

- ✓ The strategies for horticulture development should be structured into two key phases:
 - a) Pre-production interventions, focusing on input support, crop planning, and capacity building
 - b) Post-production interventions, addressing marketing, value addition, processing and export facilitation



- ✓ The Government of Telangana should provide subsidies for farm machinery through Custom Hiring Centres (CHCs) and promote the adoption of micro-irrigation systems to reduce production costs and improve efficiency
- ✓ Value addition activities must be actively promoted, enabling farmers to fetch better prices and reduce post-harvest losses
- ✓ There is a need to demonstrate the economic benefits of various horticultural crops through on-farm demonstrations at KVKs and Research Stations. Additionally, FPOs can play a key role in creating awareness among farmers on economic returns and value addition opportunities
- ✓ The cost of production should be clearly included in the package of practices (PoP), enabling farmers to make informed decisions on profitability
- ✓ Extension activities need to be intensified with a strong focus on improving economic benefits, introducing crop insurance schemes, and promoting the use of farm machinery to secure farmer incomes
- ✓ Efforts should be made to create assured markets for horticultural produce, giving farmers confidence in realizing fair prices
- ✓ Availability of skilled labor for specialized horticultural operations should be increased through training and skilling programs
- ✓ Post-harvest loss (PHL) reduction strategies must be prioritized, as even addressing 1% of PHL can result in significant economic gains for farmers. This should be integrated as a key area in the state's horticulture development strategy

Sri. D.Srujan, Project Executive, NAARM, Rajendranger

- ✓ Production, quality, and marketing are distinct but interconnected components that need focused attention to ensure the success of the horticulture sector. Each area requires dedicated strategies to enhance overall productivity and profitability
- ✓ Training FPOs (Farmer Producer Organizations) on marketing strategies and business operations is crucial to improving their effectiveness. Short-term courses at NAARM have been developed to enhance the business, financial, and digital skills of FPOs and these programs should be disseminated on a large scale to reach a wider audience



- ✓ The University should focus on providing training to FPOs on production-related aspects, ensuring they are equipped with the necessary knowledge and skills to manage horticultural practices effectively
- ✓ The University, in collaboration with NAARM, can organize specialized training programs that address production, marketing and business activities. These sessions should involve experts in the field to offer practical, actionable insights for the development of the horticulture sector
- ✓ Commercial technologies developed by the University should be actively disseminated to the farming community to ensure the widespread adoption of innovative practices that can boost productivity and marketability
- ✓ Efforts to improve farmer-related activities should include more engagement and support for enhancing skills and providing timely information on new practices and technologies
- ✓ The University should plan and organize horticulture shows and expos at the mandal and district levels, creating platforms for farmers to showcase their produce, learn new techniques, and network with industry stakeholders
- ✓ Consumer acceptance of horticultural products should be emphasized through awareness programs to help farmers understand market trends, consumer preferences, and strategies to improve the appeal of their produce

Sri. P.Someshwar Rao, DHSO, Sangareddy

- ✓ The area under vegetable crops has been decreasing in recent years due to rapid urbanization, posing a challenge to the sustainability of vegetable farming in the state
- ✓ The availability of extension staff is limited, with only 150 extension officers available, making it difficult to provide adequate guidance and support to farmers across the entire state. This limits the effectiveness of programs aimed at improving productivity and adopting new technologies
- ✓ Marketing plays a critical role in the success of horticultural crops, and while several schemes exist to support marketing efforts, implementation is hindered by the lack of sufficient extension officers



- ✓ The involvement of marketing department officials and export officials is crucial in all horticulture-related programs, especially for high-value crops like mangoes and vegetables
- ✓ There is a lack of coordination among departments and the University, which must be addressed to improve the integration of efforts and ensure more effective delivery of services to farmers
- ✓ Development of vegetable clusters should be prioritized, fostering collaboration among farmers to boost production, streamline marketing and improve economies of scale
- ✓ Despite the existence of several schemes under the Horticulture Department, implementation remains weak and efforts should be focused on ensuring proper execution of these initiatives at the ground level
- ✓ Marketing yards should be strengthened to ensure that farmers have better access to quality infrastructure for the collection, grading and sale of their produce
- ✓ The provision of infrastructure for vegetable farmers must be enhanced to improve storage, transportation, and processing facilities, ensuring that the produce can be marketed efficiently and reaches consumers in good condition
- ✓ Marketing facilities and infrastructure need to be developed and made accessible to farmers to ensure they have the necessary tools to sell their produce effectively and at fair prices

Sri. B. Sridhar, DHSO, Medchal & COE, Mulugu

- ✓ The extension staff should be strengthened to ensure that farmers receive the support and guidance necessary for adopting modern agricultural practices and improving productivity
- ✓ A marketing course can be introduced in diploma/UG programs to equip students and future professionals with the skills to navigate agricultural markets, focusing on both local and export opportunities
- ✓ A crop-specific, targeted approach for exports must be planned to ensure that the state's horticultural crops meet the demands of international markets and adhere to quality standards



- ✓ New crop varieties should be introduced and promoted, alongside encouraging exports of these new varieties, along with traditional commercial varieties, to enhance the diversity and profitability of horticulture in the state
- ✓ To boost local markets, it is essential to increase the number of markets, and youth can be encouraged to engage in the marketing business, creating new opportunities and jobs in the sector
- ✓ A strategy must be devised to curtail transport charges, which can significantly reduce the cost of marketing and make locally produced vegetables more competitive
- ✓ By focusing on early-season production, Telangana can reduce its dependence on imported vegetables from other states. A strategy to minimize vegetable imports and enhance local production must be developed
- ✓ Crop diversification, alongside the adoption of farm machinery and bund farming techniques, should be promoted to improve land use efficiency and overall farm productivity
- ✓ FPOs must take on a more active role in implementing these strategies, acting as intermediaries to help farmers adopt new technologies, access markets, and achieve better returns on their produce

Sri. Vidyasagar, FPO, Huzurabad

- ✓ "Mana Ooru Mana Kooragayalu" – The Marketing Department must take an active role in promoting local produce, ensuring that it reaches the right markets and consumers

Concluding Remarks by

Dr. D. Raji Reddy, Honorable Vice Chancellor

- ✓ Farming system-based approaches must be planned to optimize land use and improve farm productivity in the long term
- ✓ Quality, size and grading of fruits are critical factors that must be given attention throughout the production process to ensure market competitiveness



- ✓ Crop calendar is essential for better planning of sowing, harvesting, and marketing, aligning with market demand and production cycles
- ✓ Awareness about quality for export in various horticultural crops should be communicated to farmers right from the production stage, ensuring they understand market requirements and align their production accordingly
- ✓ Marketing strategies must be strengthened to provide farmers with more opportunities to sell their produce at fair prices
- ✓ Special focus should be given to lean-period vegetable production/off season vegetable production, enabling farmers to diversify their crops and maintain income throughout the year
- ✓ The use of bagging techniques should be encouraged to improve fruit quality and size, particularly in high-value crops like mango and guava
- ✓ Collaboration between various departments such as the Department of Horticulture, Department of Agriculture and FPOs is crucial for the successful implementation of the strategies to improve the income
- ✓ The role of FPOs should be clearly defined, as they are crucial in improving both production and marketing by enabling farmers to collectively access resources and markets
- ✓ The Department of Horticulture needs to be strengthened, and this will be included in the perspective plan to ensure effective support the growth of the sector
- ✓ Efforts must be made to reduce pesticide usage and minimize residues by promoting the use of biological control in fruits and vegetables. This will not only reduce production costs but also improve the sustainability
- ✓ NAARM should continue supporting the University in organizing training programs and capacity-building initiatives aimed at farmers, FPOs, and the scientific community to enhance their knowledge and skills
- ✓ Farm mechanization and micro-irrigation should be strongly supported to improve productivity and water-use efficiency in the sector
- ✓ Minimum infrastructure should be provided to FPOs to ensure that they can play an active role in improving both production and marketing, thus contributing to the development of the horticulture sector



- ✓ Business management courses could be introduced as short-term crash courses for horticulture graduates, focusing on essential skills for running a successful horticulture business
- ✓ Attention should be given to both pre-production and post-production activities, ensuring that farmers are supported throughout the entire process
- ✓ Crop diversification should be planned and communicated to farmers, highlighting the benefits of growing a wider range of crops to reduce risk and increase income
- ✓ Training programs will be organized by the Department of Horticulture and the University to enhance farmers' skills in various aspects of horticultural production and management
- ✓ Extension programs need to be documented and submitted to the press for wider dissemination of information to the farming community
- ✓ The University has proposed to conduct a Capacity Building Program for Horticulture Officers in June 2025 to enhance their skills and knowledge in line with modern horticulture practices
- ✓ Rural development should also be integrated into the training programs to ensure holistic growth for farmers in rural areas
- ✓ All of these inputs will be incorporated in the draft perspective plan for agricultural sector in Telangana



List of participants

1. Sri. A. Praveen Reddy, Mulkanoor Cooperative Society, President
2. Sri. Appa Rao, Fruit Production Bags, M/S. Fruit Tech Solutions (p) Ltd, West Godavari Dist
3. Sri. Lingala Muthyam, AGEEWA, FPO, Bhongiri
4. Sri. J. Vilas, BBWS FPC LTD, Kumarum Bheem Asifabad
5. Sri. Manohar Naidu, FPOs, Sweet Orange, Maldakar FPO, Gadwal
6. Sri K. Vinod Kumar, Coordinator, AGEEWA, FPO, Bhongiri
7. Sri. Shivashankar Director, FPO Kollapur
8. Sri. Vidyasagar, FPO, Huzurabad
9. Sri. D. Srujan, Project Executive, NAARM, Rajendrangan
10. Dr. Shanabhoga, Senior BDM, NAARM, Rajendrangan
11. Sri. B. Sridhar, DHSO, Medchal & COE, Mulugu
12. Sri. P. Someshwar Rao, DHSO, Sangareddy
13. Dr. A. Bhagwan, Registrar, SKLTGHU, Mulugu
14. Dr. M.Rajasekhar, University Librarian, SKLTGHU, Mulugu
15. Dr. D. Laxminarayana, DR, SKLTGHU, Mulugu
16. Dr. J. Cheena Nayak, DH/DSA SKLTGHU, Mulugu
17. Dr. T. Suresh Kumar, DE/DPGS, SKLTGHU, Mulugu
18. Dr. G. P. Sunandni, Technical Advisor, SKLTGHU, Mulugu
19. Dr. Veena Joshi, Technical officer to Vice Chancellor, SKLTGHU, Mulugu
20. Dr. G. Satish, Asst. Prof, SKLTGHU, Mulugu



About the Authors



Dr. D. Raji Reddy is presently Vice-Chancellor of Sri Konda Laxman Telangana Horticultural University (SKLTGHU), Mulugu, Telangana. He served ANGRAU/PJTSAU in different capacities including Director of Research and Director of Extension. He also served as a Consultant in the World Bank for Afghanistan Agromet Services project.

Dr. Raji Reddy is a distinguished Professor with over 30 years of experience in Agro meteorology research and teaching. Renowned for his pioneering work in Climate risk assessment studies, Climate change impact studies, Crop simulation modelling, Weather based agro advisories, Drought monitoring and impact assessment, Decision Support System, Remote sensing and GIS for crop planning, Yield forecasting in Agriculture and to improve resource use efficiency, development of eco-friendly and profitable Crops and cropping systems. His studies formed the basis for serving the farming community through efficient crop planning, weather based pest and disease forewarning systems, drought management and in advising the Government in policies from time to time.

He has visited United States of America, Switzerland, Australia, Sri Lanka, Cambodia, Tanzania, Indonesia, Nepal, Afghanistan and Lao PDR. He is the Life Member in various Professional Societies. He has published more than 130 research papers, handled several national and international projects and was honoured with several national and international awards and medals recognizing his outstanding contributions.



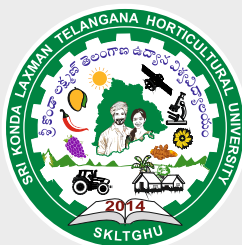
Dr. A. Bhagwan is currently the Registrar and Comptroller of Sri Konda Laxman Telangana Horticultural University (SKLTGHU), Mulugu, Telangana. He has received National level best Ph.D. Thesis award in horticulture “Dwaraknath Memorial award gold medal Award” during the year 2001. He also did Post graduate Diploma in computer Systems from Institute of Public enterprise and Diploma in applied Landscape design from Institute of Architecture.

He has 25 years of experience in research and administration. He has developed varieties and 8 technologies in mango and guava. He was Nodal officer of AICRP (Fruits) scheme on mango and guava at Fruit Research Station, Sangareddy for a period of 14 years. He guided 6 Ph. D. students and 13 M. Sc. Students as chairman and published 65 Research papers, 24 book chapters. He collaborated in 5 externally funded national projects like National Agriculture Innovation Project (NAIP) component II and IV, Mango Tree Encyclopaedia (MTE), National Initiative on Climate Resilient Agriculture (NICRA) and National Mango Databases (NMD).



Dr. G.P. Sunandini is Sr. Professor (Retd.) from PJTSAU. She has 32 years of experience in Teaching, Research and Administration. She was associated with 7 national and international externally funded projects. She has research experience in Value Chain management, Research prioritization, Impact assessment, Adaptation studies, Yield gap analysis, Data base Management, Trend & Sustainability Analysis, Commodity analysis and Climate Change impact. She has guided 10 M.Sc. and Ph.D. students. She has published

more than 30 research papers and associated in preparing more than 50 reports and policy briefs.



SRI KONDA LAXMAN TELANGANA HORTICULTURAL UNIVERSITY

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Mulugu (V & M), Siddipet District - 502279
Telangana, India

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