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# Orange Cultivation in North-East India: Problems and Prospects

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**Abstract: North-East India, comprising eight states i.e. Assam, Meghalaya, Nagaland, Mizoram, Manipur, Arunachal Pradesh, Tripura, and Sikkim possess extraordinary agro-climatic diversity that renders it one of the most promising horticultural zones in the country. Among the numerous horticultural crops cultivated in the region, mandarin orange (Citrus reticulata), specially the indigenous Khasi Mandarin variety, holds significant economic importance. The orange cultivation of North-East India is both an agricultural reality and an underexploited development opportunity. Despite possessing natural advantages including fertile hill soils, abundant rainfall, and a rich biodiversity, the orange sub-sector in the region continues to be plagued by low productivity, inadequate post-harvest infrastructure, poor market linkages, rampant disease incidence, and limited institutional support. This paper undertakes a comprehensive examination of the structural problems confronting the orange cultivation of North-East India and identifies the multifaceted prospects that, if systematically harnessed, can transform orange cultivation into a high-value engine of rural economic growth. The paper draws on secondary data from the National Horticulture Board, published academic studies, government reports, and regional agribusiness assessments. The study concludes with policy recommendations that address the constraints while leveraging the region's inherent strengths.**

***Keywords:*** *Orange Cultivation, Khasi Mandarin, Horticulture.*

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## I. INTRODUCTION

The North Eastern Region (NER) of India is often described as a biodiversity hotspot and an agricultural frontier. Spanning an area of approximately 2,62,179 square kilometres and sharing international borders with Bangladesh, China, Bhutan, and Myanmar, the NER is endowed with a unique confluence of ecological zones ranging from tropical lowlands to sub-alpine highlands. This diversity is the foundation upon which a rich horticultural heritage has flourished over centuries.

Among the several fruit crops cultivated across the eight sister states, the mandarin orange, particularly the Khasi Mandarin (Citrus reticulata var. Khasi), occupies a central role in both the subsistence economy of hill communities and the commercial horticulture sector. The Khasi Mandarin is prized for its high sugar content, rich juice quality, and distinctive aroma, setting it apart from commercially dominant varieties grown in Maharashtra and Madhya Pradesh.

India ranks among the top four producers of oranges globally, yet its per-hectare yield of approximately 11.6 MT/hectare remains far below that of the United States (32.6 MT/HA), Brazil (24.7 MT/HA), and even China (13.7 MT/HA). This productivity deficit is particularly acute in the North-East, where traditional cultivation practices, pervasive disease pressure, and systemic infrastructure deficits constrain the realisation of the region's tremendous potential.

The concept of the 'orange production' in the NER encompasses the entire value chain from cultivation and harvesting to processing, marketing, and export. It includes the livelihoods of thousands of small and marginal farming households, the activities of traders and middlemen, the operations of agro-processing units, and the aspirations of state governments seeking to diversify their rural economies beyond subsistence agriculture.

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➢ *Objectives*

This research paper aims to provide a systematic and evidence-based analysis of the problems besetting the orange cultivation of North-East India and the prospects that can be unleashed through targeted policy interventions, technological upgradation, institutional reforms, and infrastructure investment.

## II. REVIEW OF LITERATURE

Mahanta & Konwar (2014) analysed the growth of production and marketing of orange cultivation and problems related to production, marketing of orange in Assam. Sashimatsung (2015) analysed the production, farm retention, marketed surplus of orange and market intermediaries of orange cultivation in Humtso village of Wokha District. Baruah (2020) analysed the socio-economic profile of the orange growers in Ngunraw village of South West Khasi Hills District and the various problems faced by the orange growers in this area. Chase (2022) identified the economic status of the orange cultivators in Rusoma village of the Kohima District of Nagaland. The researcher found that all the orange farmers did not take any loan from any financial institution and they start up their farm with their own capital. Digarse et.al. (2025) examined the factors limiting citrus production and threats faced by orange growers Madhya Pradesh. They found that the major challenges for orange growers are- pest and disease outbreaks, inadequate subsidies, climate change effects, irregular rainfall, high cost, unavailability of disease-free rootstock, market fluctuations, shortage of trained labor and post-harvest losses.

## III. METHODOLOGY AND SCOPE

This study adopts an analytical methodology, drawing primarily on secondary sources including government reports, books and journal articles. The analysis is structured around Orange Cultivation in North-East India- problems, prospects, strengths, weaknesses, opportunities, and challenges.

## IV. ANALYSIS AND DISCUSSION

➢ *Orange Cultivation: Geographical Profile in North-East India*

Mandarin orange cultivation in the NER is spread across all eight states, with varying degrees of commercial development. The major orange-growing belts are as follows:

Table 1 Orange Cultivation: Geographical Profile in North-East India

| State | Key Growing Districts/Areas | Major Variety | Key Feature |
|---|---|---|---|
| Assam | Tinsukia, Dibrugarh, Brahmaputra Valley | Khasi Mandarin | Largest producer in NE; 'Orange cum Tea' farming |
| Meghalaya | East/West Khasi Hills, Jaintia Hills, Garo Hills | Khasi Mandarin | Unique high-sugar variety; high unrealised potential |
| Nagaland | Wokha, Phek, Kohima, Zunheboto | Mandarin Orange | Commercial scale; prominent in Wokha district |
| Mizoram | Aizawl, Lunglei, Serchhip | Mandarin Orange | Growing commercial interest; diverse horticulture base |
| Arunachal Pradesh | Wakro, Lohit, East Siang | Wakro Orange, Mandarin | Indigenous Wakro variety; impacted by CTV disease |
| Manipur | Senapati, Tamenglong | Mandarin Orange | Subsistence level; growing commercialisation |
| Sikkim | South Sikkim, West Sikkim | Mandarin, Passion Fruit | Organic-certified produce; niche market potential |
| Tripura | Plains and Hill Tracts | Mandarin, Kinnow | Focused on pineapple; orange secondary |

Source**:** National Horticulture Board; State Horticulture Departments; SFAC Value Chain Analysis Report.

Among all producing states, Assam and Meghalaya together account for the maximum area and production of Khasi mandarin in the North East. The Tinsukia District of Assam alone covers over 1,455 hectares under orange cultivation, producing approximately 23,300 metric tonnes, the largest in the state. In Meghalaya, the Khasi and Jaintia Hills Districts have historically been the heartland of Khasi mandarin cultivation. In Nagaland, mandarin orange has been commercially cultivated on a significant scale, particularly in the Wokha district, where the marketable surplus reaches up to 89% of total production.

➢ *Agro-Climatic Suitability and Natural Advantages*

The agro-climatic conditions of North-East India are uniquely suited for mandarin orange cultivation. The region receives abundant and well-distributed rainfall ranging from 750 mm to 2,500 mm annually. The altitude spectrum, ranging from near sea level in the plains to over 1,500 metres in the hills, allows for cultivation across a wide variety of ecological niches.

➢ *The Natural Advantages of the Region for Orange Cultivation are-*

- Rich biodiversity and a heritage of indigenous citrus species and varieties.
- High humidity and adequate rainfall that reduces irrigation dependency.
- Undulating hill terrain that naturally provides good drainage essential for citrus health.
- Abundant perennial rivers and water bodies ensuring a stable water supply for orchards.
- Organic-rich soils in virgin and semi-forest areas that reduce fertiliser requirements.

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- Cool winters in higher-altitude areas that trigger natural rest period beneficial for fruit set.
- The presence of the Khasi Mandarin, a variety with superior quality attributes and pharmaceutical potential.
- The region also benefits from proximity to international markets-Myanmar, Bangladesh, Bhutan, and Southeast Asia, which creates a potential export corridor for high-quality orange and processed citrus products.

## V. PROBLEMS CONFRONTING THE ORANGE CULTIVATORS IN NORTH-EAST INDIA

Despite the natural advantages and the historical significance of orange cultivation in North-East India, the sector continues to underperform relative to its potential. The problems are multidimensional, spanning production, post-harvest management, marketing, finance, and governance.

➢ *Citrus Decline and Disease Pressure:*

The single most devastating challenge to the orange cultivation in North-East India is the phenomenon of 'Citrus Decline', a complex of viral, bacterial, and physiological conditions that progressively debilitate citrus trees, leading to premature death of orchards. The principal pathogen implicated is the Citrus Tristeza Virus (CTV), which has been detected at high incidence levels in mandarin orchards across Assam, Meghalaya, Nagaland, and Arunachal Pradesh.

Studies published in peer-reviewed scientific journals confirm that CTV infection rates in North-East India are alarmingly high. In Arunachal Pradesh, a survey by the Horticulture Research and Development Mission found the decline situation so severe that farmers were forced to abandon hundreds of hectares of orchards. The economic consequences are devastating- orchards that took 5-7 years to reach bearing age are lost within a season, wiping out the capital investment of small farmers.

Beyond CTV, other disease-related problems are- Phytophthora root rot exacerbated by water-logging in poorly drained sites; Greening disease (Huanglongbing) causing fruit quality deterioration; Insect pests including aphids (Toxoptera aurantii and T. citricida) that vector CTV; Aluminium toxicity in highly acidic soils (pH < 5.0) observed in Meghalaya, causing root damage and stunted growth and ; Nutrient deficiency in rainfed orchards due to absence of fertiliser and liming practices.

➢ *Low Productivity:*

India's average orange yield of approximately 11.6 MT per hectare is already low by global standards. In North-East India, yields are even lower, often falling below 8-10 MT per hectare in many areas. This productivity gap is the result of- rainfed cultivation without supplementary irrigation management; use of unimproved, disease-susceptible planting material sourced from unregulated nurseries; lack of proper orchard management including pruning, fertilisation, and pest control; highly acidic soils with no liming or amendment programme in most orchards and poor spacing and overcrowded planting that limits air circulation and sunlight penetration.

➢ *Inadequate Post-Harvest Infrastructure:*

Post-harvest losses represent one of the most economically significant problems in the orange production sector of the NER. Estimates of post-harvest losses in Indian citrus production range from 8.3% to 30.7%, with developing country averages reaching 25-30%. In the NER, where infrastructure is particularly underdeveloped, losses at the higher end of this spectrum are common. The region suffers from various problems such as near-total absence of cold storage facilities in most orange-growing districts; a handful of agro-processing units that operate well below their installed capacity; poor packaging practices, use of bamboo and wooden baskets causes bruising and decay during transport; no grading or sorting infrastructure at the farm level or in local markets; and inadequate waxing and de-greening facilities that are essential for improving shelf life and export appearance.

➢ *Poor Road Connectivity and Transport Challenges:*

The physical geography of the NER presents formidable connectivity challenges. Most orange orchards are located in remote hilly areas accessible only by narrow mountain roads that are frequently disrupted by landslides, floods, and extreme weather events. This isolation causes multiple problems such as -high transport costs that erode farmer margins, cost of movement from orchard to market often exceeds 30-40% of farm gate price; delays in transit that accelerate fruit deterioration for a naturally perishable commodity; dependence on a single 'chicken neck' corridor connecting the NER to mainland India, which creates logistical bottlenecks; and seasonal inaccessibility that prevents timely market arrival during peak harvest (November to January).

➢ *Inadequate Market Linkages and Value Chain Development:*

The marketing of oranges in the NER is characterised by a long chain of intermediaries i.e. pre-harvest contractors, commission agents, wholesalers, and retailers, each extracting a margin that cumulatively reduces the price received by the farmer to a fraction of the final consumer price. Studies in Assam reveal that 75% of orange growers sell their produce in wholesale markets, often to pre-harvest contractors under unfavourable terms.

Contract farming, which could provide price certainty to farmers, is not prevalent in the orange marketing chain of the NER. The absence of organised buyer groups, Farmer Producer Organisations (FPOs) with bargaining power, and direct market access means that small farmers remain price-takers in an unfavourable market structure.

Furthermore, the lack of value-added processing, juices, concentrates, marmalades, essential oils, and nutraceutical extracts means that the region exports a primarily raw commodity rather than capturing the higher value segments of the orange production.

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➢ *Financial Constraints*

The financial constraints are-

- Citrus orchard establishment is capital-intensive, requiring investment in land preparation, quality planting material, fertigation systems, and orchard management for 5-7 years before commercial yields are achieved.
- For the small and marginal farmers who dominate orange cultivation in the NER, access to institutional credit is severely limited.
- High capital cost of orchard establishment without adequate institutional credit support is also a financial constraint.
- There is also limited penetration of crop insurance schemes in the NER for horticulture crops.
- Absence of structured financial products (like gold or fixed asset-based loans) suited to orchard farmers.
- Low investment in research and development relative to the orange production sector's economic potential.

➢ *Lack of Quality Planting Material*

A fundamental constraint to improving orange productivity in the NER is the non-availability of certified, disease-free, high-quality planting material. The proliferation of unlicensed nurseries selling inferior or virus-infected seedlings perpetuates the cycle of low yield and citrus decline. The rootstocks used for budding including C. volkameriana, Tanyum, Trifoliate Orange, and C. jambhiri are not always selected for local disease resistance, further compounding the problem.

➢ *Institutional and Extension Service Gaps*

The agricultural extension system in most NER states is inadequately staffed, poorly funded, and unable to provide the technical guidance that orange farmers urgently require. The Central Institute of Horticulture (CIH) established at Medziphema, Nagaland, provides technical support, but its reach across the vast and difficult terrain of the NER is limited. State horticulture departments lack the trained manpower to monitor orchard health, advise on disease management, and introduce improved practices at scale.

## VI. PROSPECTS FOR THE ORANGE CULTIVATION IN NORTH-EAST INDIA

Notwithstanding the formidable challenges, the orange cultivation of North-East India harbours substantial and realisable prospects. These prospects are grounded in the region's natural endowments, the growing demand for premium citrus products both domestically and internationally, and the increasing policy attention being directed towards the development of horticulture in the NER.

➢ *Rising Compound Annual Growth in Production*

Research tracking the horticulture sector of the NER between 2009 and 2019 reveals a rising regional growth trend in the production of fruits and vegetables, with low instability for fruits, indicating a trajectory of sustainable development. This trend, if supported by enabling policies and investments, can be accelerated, transforming the NER into a significant national contributor to citrus production beyond its current 5.1% share of national fruit production.

➢ *Premium Quality and Pharmaceutical Potential of Khasi Mandarin*

The Khasi Mandarin variety grown in Meghalaya and parts of Assam is uniquely positioned as a premium product. Its high sugar content makes it well-suited for value-added processing into concentrates, ready-to-drink juices, and specialty food products. Beyond culinary value, scientific research has documented the significant pharmaceutical activity of Khasi Mandarin's bioactive compounds, including antibacterial, antimicrobial, antiviral, antioxidant, and anti-cancer properties. This creates a powerful prospect for the pharmaceutical and nutraceutical industries to partner with growers in the NER for the supply of standardised high-quality citrus extracts.

➢ *Export Market Opportunity*

India's mandarin orange exports currently go to Bangladesh, Sri Lanka, Nepal, Canada, USA, UK, and the UAE. North-East India, with its geographical advantage of bordering Bangladesh and its proximity to Myanmar and Southeast Asian markets, is strategically placed to develop as an export hub. Research confirms that fruits and spices of the NER already have a market presence in the Middle East, and this can be leveraged to enter the markets of developed Western countries, provided quality standards and supply consistency are achieved.

The Act East Policy of the Government of India, which aims to strengthen economic and commercial ties with Southeast Asian nations, provides a diplomatic and logistical framework within which NER orange exports can be significantly expanded.

➢ *Organic Certification and Niche Market Premium*

Sikkim became India's first fully organic state in 2016, and the NER as a whole has substantial areas under traditional, low-input cultivation that can be converted to certified organic production with relatively modest interventions. Organic-certified citrus commands a price premium of 20-40% in both domestic and international markets. Given the growing global consumer preference for naturally grown, chemical-free produce, organic-certified NER orange can tap premium segments in metropolitan Indian markets and high-value export destinations.

➢ *Agro-Processing and Value Chain Development*

The development of agro-processing infrastructure, juice processing plants, concentrate extraction units, marmalade and pickle manufacturing, peel oil extraction, and pectin production represents the most transformative prospect for the orange cultivation of the NER. Processing diversifies revenue streams, reduces seasonal perishability pressure, creates year-round employment, and captures exponentially higher value than raw fruit sales. The Khasi Mandarin's high juice quality makes it particularly suitable for commercial juice and concentrate manufacturing. Investment in small and medium food processing units in orange-growing districts, supported by the Pradhan Mantri Kisan Sampada Yojana and the Production Linked Incentive (PLI) scheme for food processing, can catalyse this transformation.

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➢ *Government Policy Support and Mission Programmes*

The Government of India has demonstrated a sustained policy commitment to horticulture development in the NER. The Horticulture Mission for North-East and Himalayan States (HMNEH), operational since 2001-02 and subsequently integrated into the Mission for Integrated Development of Horticulture (MIDH), covers the entire horticulture chain from planting to consumption with backward and forward linkages. These programmes provide financial support for:

- Establishment of new orchards and rejuvenation of old ones.
- Creation of post-harvest infrastructure including cold stores, pack houses, and ripening chambers.
- Development of market linkages and value chains.
- Capacity building and training for farmers and extension workers

Additional support comes from the National Horticulture Board (NHB), the North Eastern Development Finance Corporation (NEDFi), NERAMAC (North Eastern Regional Agricultural Marketing Corporation), and the Small Farmers' Agribusiness Consortium (SFAC).

➢ *Employment Generation and Rural Livelihood Diversification*

Orange cultivation and the broader citrus value chain are inherently labour-intensive activities at every stage i.e. orchard establishment, pruning, pest management, harvesting, sorting, packaging, and processing. The expansion of the orange cultivation in the NER carries significant potential for generating gainful, skilled employment in rural areas, reducing out-migration from hill communities, and strengthening household incomes. The 'Orange cum Tea' farming model successfully practised in Tinsukia, Assam, where orange orchards are integrated with small tea gardens, demonstrates how citrus cultivation can anchor a diversified, stable rural livelihood system.

➢ *Eco-Tourism and Orange Festival Potential*

Several NER states organise orange festivals and harvest-season tourism programmes that attract visitors to the orchards during the November-January harvest period. These initiatives, if systematically developed, can create ancillary income streams for orange-growing communities through agri-tourism, direct farm sales, and the promotion of local orange-based food products. Orange festivals in Nagaland, Meghalaya, and Assam can serve as platforms for branding, consumer awareness, and market development.

## VII. SWOT ANALYSIS OF THE ORANGE CULTIVATION IN NORTH EAST INDIA

➢ *Strengths:*

- North-East India possesses diverse agro-climatic zones that are highly suitable for orange cultivation across different altitudes and climatic conditions.
- The region is famous for the indigenous Khasi Mandarin orange, which is widely appreciated for its superior taste, aroma, and quality.
- The rich biodiversity of the region supports sustainable agricultural practices and provides a favourable ecological environment for orange orchards.
- Abundant rainfall in North-East India ensures adequate water availability for orange cultivation and reduces dependence on artificial irrigation.
- The proximity of the region to international borders with countries such as Bangladesh, Bhutan, and Myanmar create opportunities for export and cross-border trade of oranges.
- Traditional farming knowledge and indigenous cultivation practices of local farmers contribute significantly to maintaining the quality and sustainability of orange production in the region.

➢ *Weaknesses:*

- Orange cultivation in North-East India suffers from low productivity compared to other major citrus-producing regions of the country.
- Citrus decline disease has become a serious challenge, leading to reduced yield and deterioration of orchard health.
- The absence of adequate cold storage facilities results in high post-harvest losses and limits the shelf life of oranges.
- Poor road connectivity in many hilly and remote areas creates difficulties in transporting oranges to markets on time.
- Weak market linkages reduce farmers' access to profitable markets and limit their bargaining power.
- Limited access to institutional credit prevents many small farmers from investing in modern cultivation techniques and orchard management.
- The use of inferior planting material and lack of quality seedlings adversely affect the productivity and quality of orange production.

➢ *Opportunities*

- Organic certification of oranges can help farmers obtain premium prices in both domestic and international markets.
- The geographical proximity of North-East India to South East Asian and Middle Eastern countries creates significant opportunities for orange export.
- The development of agro-processing industries can promote the production of value-added products such as juice, jam, squash, marmalade, and essential oils.
- Government mission funding and various horticulture development schemes provide financial and technical support for expanding orange cultivation in the region.
- Oranges and citrus by-products have growing pharmaceutical and nutraceutical applications due to their medicinal and nutritional properties.
- Orange orchards and the scenic landscape of North-East India offer strong potential for the development of agri-tourism and eco-tourism activities.
- India's Act East Policy can enhance trade, connectivity, and market access for orange growers of North-East India with neighbouring countries.

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➢ *Challenges*

- Climate change poses serious risks to orange cultivation through irregular rainfall, rising temperatures, droughts, and extreme weather events.
- The spread of Citrus Tristeza Virus (CTV) epidemic threatens orange orchards by causing severe decline in plant health and productivity.
- Competition from cheap imported oranges in domestic markets may reduce the profitability of local orange growers in North-East India.
- Political instability and occasional regional disturbances can disrupt transportation, trade, and agricultural activities in the region.
- Land tenure issues and unclear ownership rights often discourage farmers from making long-term investments in orchard development.
- Continuous soil degradation due to erosion, nutrient depletion, and unsustainable farming practices adversely affects orange productivity.
- Youth out-migration from rural areas to urban centres has created labour shortages and reduced the participation of younger generations in orange cultivation.

## VIII. POLICY RECOMMENDATIONS

Based on the foregoing analysis, the following policy recommendations are advanced to address the structural problems and systematically realise the prospects of the orange cultivation in North-East India.

➢ *Disease Management and Orchard Rejuvenation*

- Establish a network of state-funded certified nurseries producing CTV-indexed, disease-free Khasi Mandarin planting material in all major producing states.
- Launch a Citrus Rejuvenation Mission for the NER, modelled on successful programmes in Maharashtra, to replace ageing and diseased orchards with improved, resistant varieties.
- Invest in molecular surveillance of CTV and other citrus pathogens to enable early detection and quarantine management.
- Implement liming programmes and soil pH correction in highly acidic Meghalaya orchards through subsidised lime supply and extension guidance.

➢ *Post-Harvest Infrastructure Development*

- Prioritise the construction of small-scale cold storage units (50-100 MT capacity) at strategic locations in orange-growing districts, accessible to groups of farmers.
- Establish pack houses and grading-sorting facilities at key collection centres.
- Promote CFB (Corrugated Fibre Board) packaging as the standard for transport, replacing bamboo and wooden baskets that cause bruising.
- Develop de-greening chambers and waxing facilities to improve the marketability and shelf life of oranges for export.

➢ *Market Development and Value Chain Integration*

- Promote the formation of Farmer Producer Organisations (FPOs) and Orange Grower Cooperatives to aggregate produce and improve bargaining power.
- Develop direct marketing platforms both physical and digital, connecting NER orange growers to urban consumers in metropolitan markets.
- Facilitate partnerships between FPOs and agro-processing companies for backward integration and assured price mechanisms.
- Brand the Khasi Mandarin as a Geographical Indication (GI) product to command premium pricing in domestic and export markets.

➢ *Infrastructure and Connectivity*

- Accelerate road construction and maintenance in key orange-growing districts to reduce transport time and cost.
- Develop multi-modal logistics corridors connecting NER horticultural zones to rail heads, airports, and Bangladesh border trade points.
- Expand the cold chain network along major transport routes to maintain quality during transit.

➢ *Financial Inclusion and Insurance*

- Design and launch a dedicated Citrus Orchard Credit Scheme through NABARD, providing long-term loans (7-10 years) aligned with orchard gestation periods.
- Extend the Pradhan Mantri Fasal Bima Yojana to cover mandarin orange orchards in all NER States.
- Create a Horticulture Investment Promotion Agency for the NER to attract private investment in agro-processing and cold chain infrastructure.

➢ *Research, Technology, and Extension*

- Strengthen the Central Institute of Horticulture (Nagaland) and establish satellite research stations in Meghalaya, Assam, and Arunachal Pradesh
- Develop and disseminate improved packages of practices (PoP) tailored to the agro-climatic conditions of each NER state.
- Integrate drone-based orchard monitoring, mobile-based disease identification apps, and digital soil health mapping into the extension system.
- Partner with agricultural universities in the NER for collaborative research on CTV-resistant rootstocks and improved Khasi Mandarin clones

## IX. CONCLUSION

The orange cultivation of North East India stands at a critical juncture. On one side it lies the historical reality of underperformance-diseased orchards, declining productivity, poor infrastructure, and marginalised farmers receiving a fraction of the value created by their labour. On the other side it lies a compelling vision- a modernised, technology-enabled citrus sector that harnesses the unique quality of the Khasi Mandarin, taps growing domestic and international markets, creates rural employment, and contributes substantially to the economic development of one of India's most geographically and culturally distinctive regions. The transformation of this

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vision into reality requires a convergence of several enablers such as sustained government investment in infrastructure and research, private sector participation in agro-processing and market development, institutional reform to empower farmer organisations, and technical innovation to address the disease challenge that threatens the very foundation of the sector.

The North-East India orange cultivation is not merely an agricultural sub-sector; it is a development opportunity- one that connects livelihoods, culture, biodiversity, and economic aspiration. With the right policy architecture, institutional framework, and investment environment, the orange cultivation of the NER can emerge as a model of sustainable, inclusive agricultural growth for the region and the nation.

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