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Problems and Prospects of Mango Cultivation in Patan Tahsil, Satara District

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Abstract

Mango cultivation is an important horticultural activity contributing significantly to rural livelihoods in Patan Tahsil of Satara district, Maharashtra. The region is well known for high-quality mango production due to favourable agro-climatic conditions, fertile soils, and increasing adoption of horticultural practices. During the last two decades, the area under mango cultivation has increased substantially because of rising market demand and government support for fruit crops. However, mango growers continue to face several challenges affecting productivity and profitability. The major problems include climatic variability such as uncertain rainfall, extreme temperature fluctuations, foggy weather, and heavy rainfall, which adversely affect flowering and fruit setting. Operational constraints like labour shortages, high labour costs, water scarcity, and irregular electricity supply further disrupt orchard management. Excessive dependence on chemical fertilizers, lack of technical knowledge, and plant protection issues such as high pesticide costs and inferior-quality inputs also reduce yields. Despite these limitations, the study highlights strong prospects for sustainable mango cultivation through scientific orchard management, integrated pest and nutrient management, improved irrigation facilities, and better marketing and storage infrastructure. Addressing these issues can significantly enhance productivity and farmers' income in Patan Tahsil.

Keywords: Mango cultivation; Horticulture; Agricultural problems; Farmers' income; Patan Tahsil; Maharashtra

Introduction

Mango (*Mangifera indica* L.) is one of the most important horticultural crops in India, contributing significantly to the income of small and marginal farmers. Patan Tahsil, due to its favourable agro-climatic conditions, supports extensive mango cultivation. However, growers face multiple challenges that affect productivity and profitability. Natural hazards such as uncertain rainfall, extreme temperature fluctuations, and foggy weather directly influence flowering and fruit set, while heavy rainfall leads to soil erosion and fruit drop (Gholap, 2024 & Kumar & Singh, 2020; Reddy et al., 2019).

Timely farm operations are hindered by labour shortages and high labour costs, as well as irregular water supply and electricity, which limit efficient orchard management (Patel et al., 2018). Inadequate technical knowledge and improper orchard management practices further reduce productivity. Over-reliance on chemical fertilizers and insufficient use of organic inputs compromise soil fertility and increase production costs (Sharma, 2021). Plant protection challenges, including high pesticide costs, poor-quality products, and limited financial support, exacerbate pest and disease problems, leading to yield losses (Verma et al., 2017).

Despite these constraints, mango cultivation in Patan tahsil has considerable potential. Adoption of modern horticultural practices, sustainable water management, integrated pest control, and stronger institutional support can significantly improve production and farmer income.

Study Area

Patan tahsil is located in Satara district, Maharashtra, at 17°36' N latitude and 74°12' E longitude, with an average elevation of 582 meters. (Fig. 1) The region is characterized by hilly terrain, fertile soils, and a semi-humid climate.

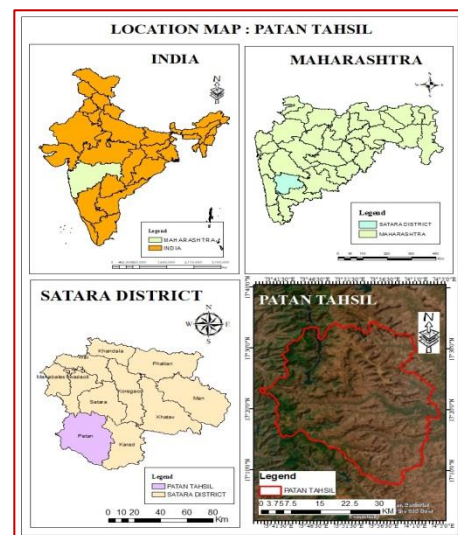


Fig.1

Out of 338 villages, mango cultivation is concentrated in nearly 60 villages. Despite favourable natural conditions, issues like fragmented landholdings, irregular monsoon, and inadequate marketing infrastructure affect mango production.

Patan tahsil is known for high-quality mango production. As per the 2011 Census, out of 338 villages, mango cultivation occurs in about 60 villages. For detailed analysis, 12 villages (20%) were selected for the case study. (Fig. 2).

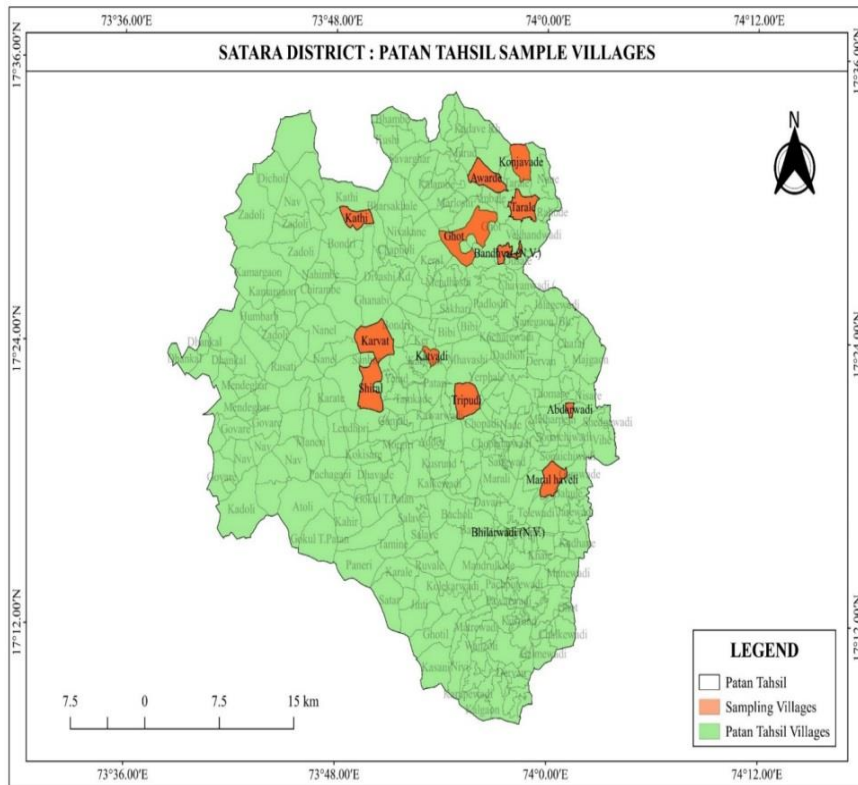


Fig. 2

Methodology

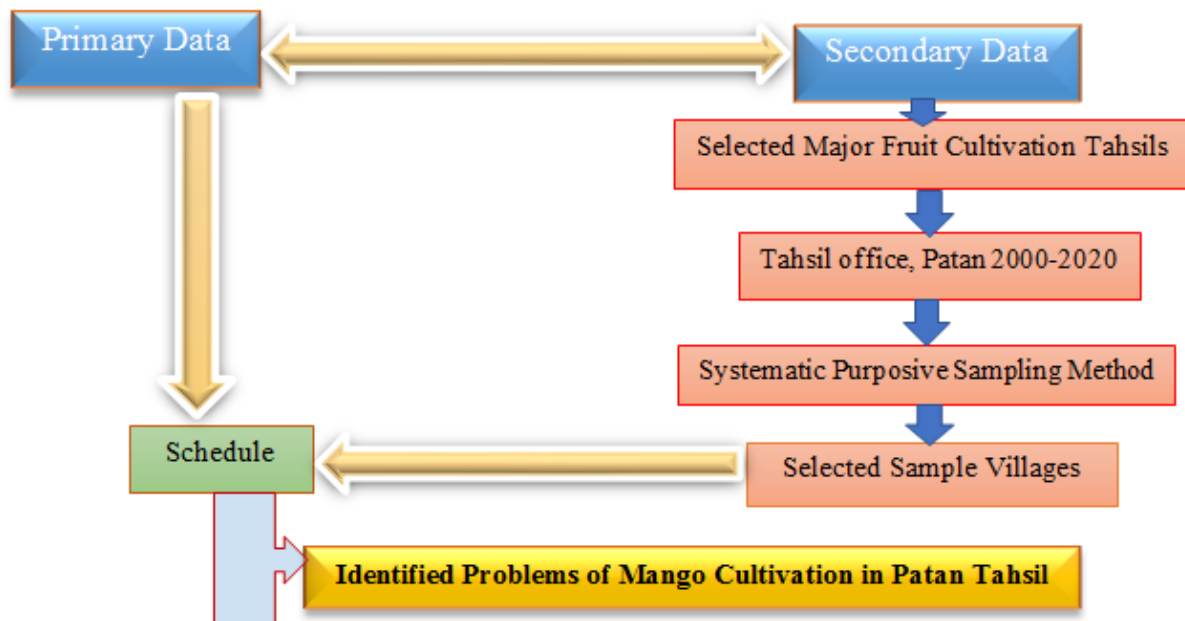


Fig. 3

Objectives

1. To identify major problems faced by mango cultivators in Patan tahsil.
2. To suggest sustainable strategies to improve mango productivity and farmer income.

Statement of the Problem

Mango growers in Patan Tahsil face multiple challenges, including climatic uncertainties, labour shortages, inadequate technical knowledge, dependence on chemical fertilizers, and pest management issues, which collectively reduce productivity and profitability (Kumar & Singh, 2020).

Mango Cultivation in Patan Tahsil

Mango cultivation in Patan Tahsil has expanded significantly over the past two decades, increasing from 20.6 hectares in 2000–01 to 891.44 hectares in 2019–20. This remarkable growth is largely due to government initiatives promoting horticulture, increasing market demand for mangoes, and favourable climatic conditions. However, several challenges continue to affect productivity and profitability.

Table 1 Area Under Mango Cultivation In Patan Tahsil (2000-01 to 2019-20) (Area in Ha.)

Years	Satara District	Volume Of Change
2000-01	20.6	-
2001-02	36.75	16.15
2002-03	54.9	17.34
2003-04	79.16	25.07
2004-05	107.73	28.57
2005-06	154.46	46.73
2006-07	264.15	109.69
2007-08	340.16	76.01
2008-09	302.98	37.18
2009-10	263.08	39.09
2010-11	285.84	22.76
2011-12	68.02	217.82
2012-13	125.54	57.52
2013-14	65.1	60.44
2014-15	165.18	100.08
2015-16	85.32	79.86
2016-17	113.42	28.01
2017-18	435.21	321.79
2018-19	496.68	61.47
2019-2020	891.44	394.76

Source: Based on, Tahsil office, Patan (2000-01 to 2019-20) .

Problems of Mango Cultivators

The survey conducted among mango cultivators in Patan tahsil highlights several critical challenges. These problems can be categorized into natural hazards, farm operations, management issues, fertilizer usage, and plant protection.

Table 2 Problems of Mango cultivation

Sr. No.	Problems of Mango cultivation	No. of Respondents	%
1.	Natural Hazards		
	i) Uncertain rainfall	60	85.71
	ii) Extreme rise and fall in temperature	36	51.42
	iii) Foggy weather	27	38.57
	iv) Heavy rainfall	40	57.14
2.	Timely farm Operations		
	i) Non-availability of labourers in time	69	98.57
	ii) High charges of labourer with less efficiency	55	78.57
	iii) Shortage of water-supply	51	72.85
	iv) Irregular electricity supply	60	85.71
3.	Improper Management		
	i) Over irrigation	04	5.71
	ii) Lack of Tech knowledge	32	45.71

4.	Use of Fertilizer		
	Organic	2	2.86
	Inorganic	68	97.14
5.	Plant Protection		
	i) High, cost of pesticides	60	85.71
	ii) Inadequacy of finance	56	80
	iii) Inferior quality of pesticides	42	60

Source: Based on field work.

1. Natural Hazards

Mango cultivation in Patan Tahsil is highly influenced by climatic variability. A majority of farmers (85.71%, 60 respondents) reported **uncertain rainfall**, which disturbs flowering and fruit setting. Around 51.42% (36 respondents) experienced extreme fluctuations in temperature affecting physiological growth, while 38.57% (27 respondents) mentioned foggy weather as a hindrance during fruit development. Additionally, 57.14% (40 respondents) faced yield losses due to **heavy rainfall**, which leads to soil erosion and fruit dropping. These climatic uncertainties collectively create instability in mango production.

2. Timely Farm Operations

Farm operations in mango orchards are largely affected by labour and resource availability. The most critical issue was **non-availability of labourers**, reported by 98.57% (69 respondents), showing a major dependency on seasonal labour. High labour charges with low work efficiency were observed by 78.57% (55 respondents). Furthermore, 72.85% (51 respondents) faced **water shortages**, while 85.71% (60 respondents) reported irregular electricity supply, resulting in delayed irrigation and maintenance activities. These constraints severely reduce operational efficiency and ultimately lower yield.

3. Improper Management

Management-related issues also contribute to reduced productivity. Although only 5.71% (4 respondents) reported over-irrigation problems, a significant 45.71% (32 respondents) indicated a **lack of technical knowledge** regarding improved orchard care, pruning, fertilization, and pest control. This gap in skill and technology adoption restricts farmers from fully utilising the agro-climatic potential of the region, resulting in lower yields.

4. Use of Fertilizers

Fertilizer use in Patan Tahsil is highly skewed towards chemicals. Only 2.86% (2 respondents) practiced organic fertilization, whereas 97.14% (68 respondents) depended on **inorganic fertilizers** due to easy market availability and quicker response. However, this long-term reliance on chemical inputs increases production cost and can degrade soil fertility over time, posing a sustainability concern for future mango production.

5. Plant Protection Issues

Plant protection emerged as one of the most challenging aspects of mango cultivation. 85.71% (60 respondents) found **pesticides expensive**, and 80% (56 respondents) lacked adequate financial resources to purchase high-quality plant protection material. In addition, 60% (42 respondents) reported the issue of **inferior or adulterated pesticides** in the market. These factors weaken pest management efficiency, causing yield loss and increasing overall production risk.

Conclusion

The study concludes that Patan Tahsil possesses considerable potential for sustainable mango cultivation due to its favourable agro-climatic conditions and expanding horticultural base. Although the area under mango cultivation has increased remarkably, productivity remains constrained by climatic uncertainties, labour shortages, water scarcity, excessive use of chemical inputs, and plant protection problems. Addressing these challenges through scientific orchard management, adoption of integrated pest and nutrient management practices, improved irrigation and electricity supply, and farmer training programmes can substantially enhance mango productivity and farmers' income. Strengthening market and storage facilities will further improve profitability. With systematic planning and institutional support, mango cultivation in Patan Tahsil can emerge as a sustainable and economically viable agricultural activity.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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