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Impact of Fruit Drop in Mango Orchards: A Field-Level Study in East Burdwan, West Bengal

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Abstract: -

Mango fruit-drop rates ranged from 12 to 20% in five East Burdwan clusters, according to a field research conducted between March and May 2023. This resulted in a considerable loss of output and income. Unbalanced nutrition, erratic irrigation, pests, and improper use of chemicals are major contributors. In order to minimize losses and improve orchard production, farmers who are not well-versed in soil testing require integrated techniques, which include biological sprays, mulching, pruning, soil-health-based fertilization, and FPO support.

Keywords: Mango fruit drop, Nutrient imbalance, Pest infestation, Orchard management

1. Introduction:

Celebrated as the 'King of Fruits,' mangos are not only a mainstay of Indian summers but also play a significant role in the agrarian economy in places like East Burdwan. However, premature fruit loss has been a persistent problem for mango orchardists in recent seasons, which has greatly impacted farmer incomes, quality, and yields. This case study examines the causes, effects, and management strategies associated with mango fruit drop through a data-supported field inquiry conducted in a few East Burdwan villages.

2. Objectives

- To analyze the incidence of mango fruit drop across different agro-climatic microzones in East Burdwan.
- To quantify the impact of fruit drop on production and revenue.
- To identify farmer-level practices influencing fruit drop.
- To recommend practical, low-cost interventions to minimize fruit loss.

3. Study Area and Scope

This study focuses on five mango-growing clusters:

1. Agradwip

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2. Bhatar
3. Khandaghosh
4. Kalna
5. Raina

4. Methodology

- **Data Collection Period:** March to May 2023
- **Sample Size:** 1 Farmer per Village
- **Tools Used:** Interviews, direct yield observation, Plot measurement, and semi-structured questionnaires.
- **Software:** MS Excel,Word (for data visualization)

5. Farmer Profiles (Table - 1)

Table No. 1: Farmer Profiles

Farmer Name	Village	Land Holding	Practice Style	Key Issue Faced
Mr. Shyamal Ghosh	Agradwip	2.5 acres	Organic Integrated	Premature Fruit Shedding
Mrs. Ruma Saha	Bhatar	3 acres	Drip irrigated	Nutrient deficiency
Mr. Haran Dey	Khandanghosh	1.5 acres	Traditional	Leaf curl and fruit rot
Mr. Tapan Majhi	Kalna	4 acres	Chemical-Intensive	Heavy pest infestation
Mrs. Chitra Bagchi	Raina	3 acres	Eco-Friendly	Sudden drop after rainfall

6. Field-Level Observations & Data

Table 2: Mango Production and Fruit Drop (2023)

Village	Total Production (Quintals)	Fruit Drop (%)	Fruit Drop (Quintals)	Effective Harvest
Agradwip	1200	15%	180	1020
Bhatar	980	18%	176.4	803.6
Khandaghosh	1100	12%	132	968
Kalna	1350	20%	270	1080
Raina	1020	17%	173.4	846.6

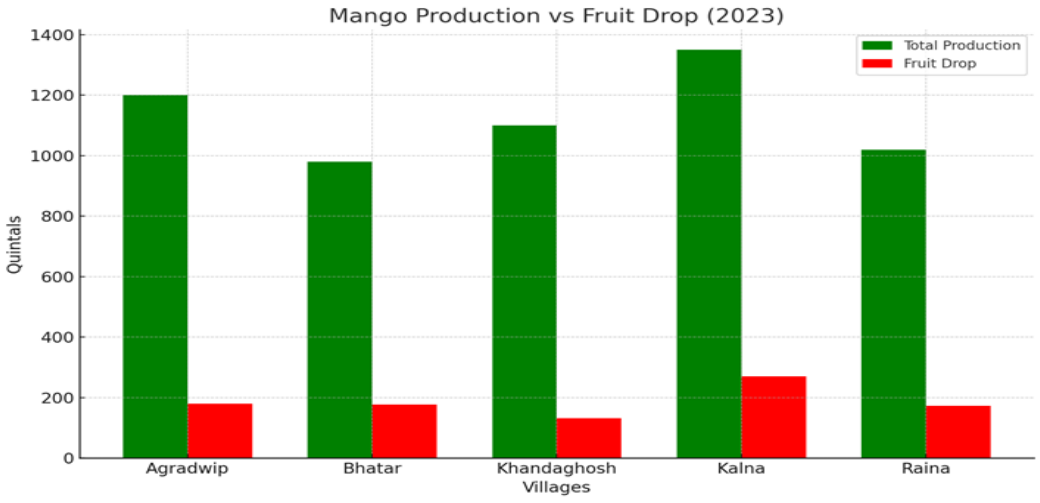

Figure 1: Mango Production vs Fruit Drop (2023)

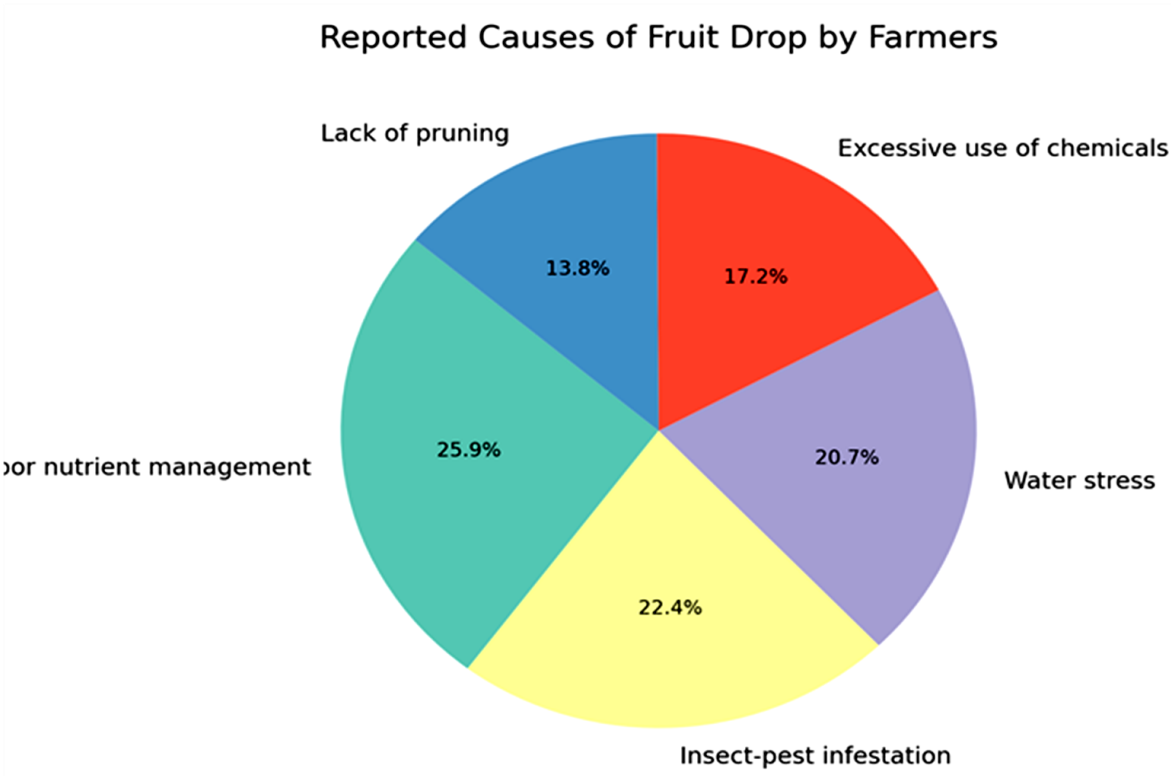

Figure 2: Reported Causes of Fruit Drop by Farmers

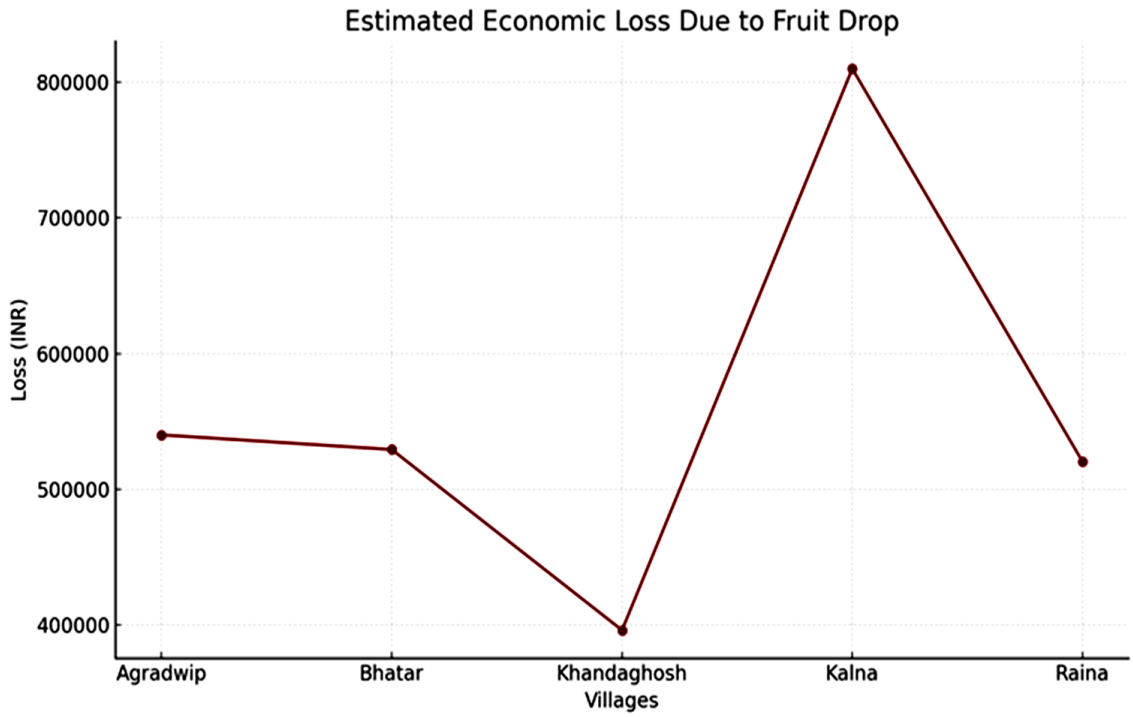

Figure 3: Estimated Economic Loss Due to Fruit Drop

7. Qualitative Insights from Farmers

- Climate Sensitivity: Mango trees in Bhatar and Raina showed heavy drop after sudden heatwaves.
- Soil Test Awareness: Only 24% of surveyed farmers used Soil Health Card data.
- Pest Pressure: Kalna recorded high fruit borer and hopper infestations.

8. Factors Influencing Fruit Drop

Factor	Field Evidence	Severity
Nutrient Imbalance	Low leaf NPK levels	High
Irregular irrigation	Drought followed by heavy rain	Medium
Pest and Diseases	Borer and anthracnose in Kalna	High
Chemicals Overuse	Fruit burn, phytotoxicity noted	Medium
Lack of mulching and pruning	Weak fruit set	Medium

9. Recommendations

⇨ **Short-Term:**

- **Biological Sprays:** Use neem oil + pongamia extracts for pest management.
- **Micronutrient Foliar Spray:** Micronutrient Foliar Spray: 0.3% spray of boric acid and 0.5% $ZnSO_4$

⇨ **Medium-Term:**

- **Mulching:** Organic mulch to conserve soil moisture.
- **Canopy Management:** Proper pruning post-harvest for light penetration.

⇨ **Long-Term:**

- Farmer Training Programs
- Customised Fertilizer Plans Using Soil Health Card
- Formation of Mango Grower Producer Groups (FPOs)

10. Conclusion

According to this field-level study conducted in East Burdwan, scientific orchard management can greatly minimize mango fruit loss, even though it is somewhat natural. The key to reducing yield loss and guaranteeing economic resilience in mango agriculture is to equip farmers with information and access to biological instruments, precision irrigation, and soil analysis.