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Constraints faced by onion growers in Perambalur district of Tamil Nadu: An empirical assessment

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Abstract

Onion (*Allium cepa* L.) is an economically important vegetable crop in India and occupies a significant position in Tamil Nadu, particularly through the cultivation of small onion. Perambalur district is one of the important onion-growing regions of the state. However, onion growers face several production and post-harvest constraints that adversely affect productivity and profitability. The present study was undertaken to identify and rank the major constraints faced by onion growers in Perambalur district of Tamil Nadu. An ex-post-facto research design was adopted, and Perambalur district was purposively selected based on its importance in onion cultivation. A multistage sampling procedure was followed, involving the random selection of three blocks and eight villages, from which 120 onion growers were selected through simple random sampling. Data were collected through personal interviews using a structured interview schedule and analysed using appropriate statistical techniques. The findings revealed that high labour cost was the most prominent constraint, reported by 93.33 Per cent of the respondents, followed by high post-harvest losses (88.33 Per cent), shortage of labour during cultivation (87.50 Per cent), lack of proper storage facilities (85.83 Per cent), and difficulty in obtaining labour during harvesting (82.50 Per cent). Climate-related problems, pest and disease incidence, high input costs, irrigation-related constraints, and non-availability of quality planting materials were also reported by a substantial proportion of farmers. The study emphasizes the need for labour-saving technologies, improved post-harvest and storage infrastructure, efficient water management, timely availability of quality inputs, and need-based capacity-building interventions to strengthen onion production and profitability in the district.

Keywords: Onion, constraints, small onion, labour, post-harvest losses, storage, climate change, Perambalur, Tamil Nadu

1. Introduction

Onion (*Allium cepa* L.) is one of the most important bulb crops cultivated and consumed worldwide. In India, onion occupies a prominent position among vegetable crops owing to its high domestic consumption, market demand, and economic importance to farming households. The crop is cultivated extensively across different agro-climatic regions and is grown during both kharif and rabi seasons.

Tamil Nadu is an important onion-producing state, with small onion occupying a particularly significant position among vegetable crops. Small onion serves as an important source of income for farmers in several districts of the state. Among the major onion-growing regions, Perambalur district has considerable importance owing to its substantial area under small onion cultivation and favourable conditions for onion production.

Despite its economic importance, onion cultivation is associated with several production, labour, climatic, pest and disease, irrigation, input supply, harvesting, storage, and marketing-related challenges. These constraints can increase the cost of cultivation, reduce yield and quality, and

contribute to post-harvest losses. Identifying and prioritizing these constraints is therefore essential for developing appropriate interventions and extension strategies.

Against this background, the present study was undertaken to identify and rank the major constraints faced by onion growers in Perambalur district of Tamil Nadu.

2. Objectives of the Study

The study was undertaken with the following objective:

1. To identify and rank the major constraints faced by onion growers in Perambalur district of Tamil Nadu.

3. Research Methodology

3.1 Research Design

An ex-post-facto research design was adopted for the study, as the characteristics and conditions under investigation had already occurred and could not be manipulated by the researcher.

3.2 Selection of the Study Area

Perambalur district was purposively selected as the study area

because of its importance in onion cultivation. The district represents an important production region for small onion in Tamil Nadu.

3.3 Sampling Procedure

A multistage sampling procedure was followed for the selection of respondents. Three blocks and eight villages were randomly selected. From the selected villages, 120 onion growers were chosen through simple random sampling and constituted the sample for the study.

3.4 Data Collection

Primary data were collected through personal interviews using a structured interview schedule developed for the study. Information provided by the respondents was cross-checked

wherever necessary to ensure consistency and reliability.

3.5 Data Analysis

The collected data were tabulated and analysed using appropriate statistical techniques. Pearson's correlation coefficient was used to examine the relationships between selected independent and dependent variables, while multiple regression analysis was employed to determine the contribution of selected independent variables. Statistical analysis was carried out using SPSS.

4. Results and Discussion

The major constraints reported by onion growers were ranked based on the number and percentage of respondents experiencing each constraint.

Table 1: Major constraints faced by onion growers

Rank	Constraint	Respondents (n=120)	Percentage
1	High labour cost affecting onion production	112	93.33
2	High post-harvest losses	106	88.33
3	Shortage of labour during onion cultivation	105	87.50
4	Lack of proper storage facilities	103	85.83
5	Difficulty in obtaining labour during harvesting	99	82.50
6	Climate change affecting onion production	97	80.83
7	Pest infestation reducing onion yield	97	80.83
8	Lack of knowledge on pest and disease management	95	79.16
9	Disease incidence causing heavy crop losses	93	77.50
10	High cost of onion seeds/bulbs	92	76.66
11	Drought conditions reducing onion yield	92	76.66
12	Difficulty in harvesting operations	91	75.83
13	Soil fertility problems affecting production	90	75.00
14	Irregular electricity supply for irrigation	90	75.00
15	Delay in availability of farm inputs	88	73.33
16	Heavy rainfall damaging onion crop	87	72.50
17	High cost of pesticides	85	70.83
18	Water scarcity affecting onion cultivation	85	70.83
19	High cost of fertilizers	82	68.33
20	Non-availability of quality seeds/bulbs	75	62.50

4.1 Labour-related constraints

High labour cost emerged as the most important constraint, reported by 112 respondents (93.33 Per cent). Onion cultivation involves considerable labour requirements during land preparation, transplanting, weeding, intercultural operations, harvesting, grading, and post-harvest handling. Consequently, increases in labour costs place a substantial financial burden on onion growers.

Shortage of labour during cultivation was ranked third, with 105 respondents (87.50 Per cent), while difficulty in obtaining labour during harvesting was ranked fifth, with 99 respondents (82.50 Per cent). The seasonal concentration of labour requirements and competition for agricultural workers from other agricultural and non-agricultural activities may contribute to this problem.

Difficulty in harvesting operations was also reported by 91 respondents (75.83 Per cent). Delayed harvesting due to inadequate labour availability may result in over-maturity, bulb deterioration, and reduced market quality. Wet soil conditions following rainfall may further complicate harvesting operations.

4.2 Post-harvest and storage constraints

High post-harvest losses constituted the second most

important constraint, reported by 106 respondents (88.33 Per cent). Farmers reported losses associated with harvesting, handling, drying, grading, storage, and transportation. Onion bulbs are susceptible to physical damage and spoilage when appropriate post-harvest practices are not followed.

Lack of proper storage facilities was ranked fourth, with 103 respondents (85.83 Per cent). The absence of adequate scientific storage structures restricts farmers' ability to preserve harvested onions for longer periods and may contribute to deterioration in quality and shelf life.

These findings highlight the importance of strengthening post-harvest management practices and improving access to suitable onion storage facilities.

4.3 Climate and water-related constraints

Climate change affecting onion production was reported by 97 respondents (80.83 Per cent) and ranked sixth. Onion requires suitable temperature and adequate soil moisture for satisfactory growth and bulb development. Variations in climatic conditions can therefore adversely affect crop performance.

Drought conditions reducing onion yield were reported by 92 respondents (76.66 Per cent). Inadequate rainfall and prolonged dry periods may reduce water availability for

irrigation, affecting vegetative growth and bulb development. Heavy rainfall damaging the onion crop was reported by 87 respondents (72.50 Per cent). Excessive soil moisture and prolonged waterlogging can adversely affect root growth and bulb development.

Water scarcity was reported by 85 respondents (70.83 Per cent). Irregular rainfall and limited availability of irrigation water may contribute to water stress during critical stages of crop growth.

Irregular electricity supply for irrigation was also reported by 90 respondents (75.00 Per cent). Frequent power interruptions, irregular supply timings, and voltage fluctuations can make timely irrigation difficult for farmers.

4.4 Pest and disease-related constraints

Pest infestation reducing onion yield was ranked seventh, with 97 respondents (80.83 Per cent). Farmers experienced difficulties in correctly identifying major insect pests and diseases, particularly during the early stages of infestation. Similar symptoms caused by different pests or diseases can make diagnosis difficult and may lead to inappropriate management decisions.

Lack of knowledge on pest and disease management was reported by 95 respondents (79.16 Per cent). Inadequate awareness regarding preventive measures, recommended pesticides and fungicides, dosage, and appropriate application methods may result in delayed or improper management, thereby increasing production costs and crop losses.

Disease incidence causing heavy crop losses was reported by 93 respondents (77.50 Per cent). Onion is susceptible to several diseases, particularly under favourable weather conditions and high moisture levels. Effective diagnosis and timely management are therefore important for minimizing yield losses.

4.5 Input-related constraints

The high cost of onion seeds/bulbs was reported by 92 respondents (76.66 Per cent). The increasing price of quality planting material can raise the initial cost of cultivation and may particularly affect small and marginal farmers.

Delay in the availability of farm inputs was reported by 88 respondents (73.33 Per cent). Farmers indicated that essential inputs such as quality seeds and bulbs, fertilizers, pesticides, biofertilizers, and crop-protection materials were not always available at the required time.

The high cost of pesticides was reported by 85 respondents (70.83 Per cent), while the high cost of fertilizers was reported by 82 respondents (68.33 Per cent). These costs increase the overall financial burden associated with onion cultivation.

Non-availability of quality seeds/bulbs was reported by 75 respondents (62.50 Per cent), indicating difficulties in obtaining good-quality and disease-free planting material at the right time and in sufficient quantities.

4.6 Soil fertility constraints

Soil fertility problems affecting production were reported by 90 respondents (75.00 Per cent). Continuous cultivation, repeated use of chemical fertilizers, inadequate application of organic manures, and improper nutrient management may contribute to nutrient depletion or imbalance. Maintaining

soil fertility through balanced and appropriate nutrient management is therefore important for sustaining onion productivity.

5. Overall Ranking of Constraints

The findings demonstrate that onion growers face a combination of economic, labour, post-harvest, climatic, biological, irrigation, soil fertility, and input-related constraints. Labour and post-harvest issues were particularly prominent. High labour cost occupied the first rank, followed by post-harvest losses and labour shortage during cultivation. The prominence of these constraints indicates that interventions aimed at improving onion production should not focus exclusively on crop production technologies. Equal attention should be given to labour-saving technologies, harvesting and post-harvest practices, storage infrastructure, irrigation management, timely input supply, and farmer capacity building.

6. Implications for Extension and Capacity Building

The findings have important implications for agricultural extension agencies and other stakeholders involved in onion development. Extension programmes should prioritize practical, location-specific interventions addressing the constraints most frequently reported by farmers.

The following interventions may be considered

- Promotion of labour-saving technologies:** Appropriate mechanization and labour-saving equipment should be promoted for land preparation, weeding, harvesting, and post-harvest operations.
- Strengthening post-harvest management:** Farmers should be trained in scientific harvesting, curing, drying, grading, handling, packaging, and transportation practices.
- Improvement of storage facilities:** Access to appropriate onion storage structures should be strengthened to reduce post-harvest losses and enable farmers to maintain quality.
- Climate-resilient production practices:** Extension programmes should promote appropriate water-management practices and technologies that help farmers cope with drought, irregular rainfall, and excessive rainfall.
- Integrated pest and disease management:** Capacity-building programmes should emphasize pest and disease identification, preventive measures, integrated management, recommended pesticides and fungicides, dosage, and safe application methods.
- Timely input availability:** Institutional mechanisms should be strengthened to ensure the timely availability of quality seeds, bulbs, fertilizers, biofertilizers, and crop-protection materials.
- Soil fertility management:** Farmers should be encouraged to adopt balanced nutrient management and appropriate use of organic manures to maintain soil health.

7. Conclusion

The study reveals that onion growers in Perambalur district face multiple constraints affecting the productivity, quality, and profitability of onion cultivation. High labour cost

emerged as the most serious constraint, followed by post-harvest losses, shortage of labour during cultivation, inadequate storage facilities, and difficulty in obtaining labour during harvesting. Climate variability, pest and disease problems, irrigation constraints, high input costs, soil fertility issues, and inadequate availability of quality planting materials were also important concerns.

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