Constraints faced by the farmers in the production and marketing of onions in the western undulating zone of Odisha, India

ABSTRACT

This paper aimed to investigate the limitations associated with onion farming in the western undulating agroclimatic zone of Odisha, specifically regarding production, marketing, and storage. The study employed a multi-stage purposive sampling technique. The state was divided into 10 zones based on agro-climatic characteristics, and the district from the western undulating zone, Kalahandi districts, was purposively chosen since many farmers in these regions, like others in Odisha, cultivate onions throughout the winter season. A total of 90 farmers (45 from Bhawanipatna block and 45 from Golamunda block) were selected at random and interviewed directly for the purpose of study. Furthermore, the location, climatic conditions, and soil are ideal for onion cultivation. Kalahandi was chosen in 2021–2022. According to the survey, labour shortages for weeding, ignorance of improved varieties, high labour costs, ineffective and expensive weedicides, high seed costs, etc. were the top five problems faced by onion growers. The main difficulties faced by onion growers during marketing included low prices during harvest, which were followed by sharp price fluctuations, high transportation costs, payment delays, a lack of market news and information, a lack of storage facilities, etc. in the research area. To ensure an effective produce marketing system, the government, developmental agencies, marketing boards, and NAFED should intervene by enhancing the market infrastructure at the taluk and district levels and supplying timely market information. Farmers may be able to overcome the issue of price fluctuations if government authorities intervene promptly and announce an extension or announcement of the government support price for onion crops.

KEY WORDS: Constraints, Improved Practices, Marketing, Production, Storage, Suggestions

INTRODUCTION

In India, vegetable farming has long been important, and now it's becoming more and more well-liked because of its major contribution to the food and nutritional security of the nation's expanding population. Onion is the most widely produced vegetable crop in India that is farmed for commercial purposes. One of the most significant vegetables in the world to be grown and consumed commercially is the onion (*Allium cepa* L.). Since at least 4000 BC, it has been grown and consumed nearly everywhere in the world. Around the world, onions are used for cooking a variety of cuisines or as green leaves in salads. They can also be used as immature or mature bulbs. It is referred to by Germans as the "Queen of the

Kitchen" because of its significance in cooking. In addition, onions include phosphate, calcium, carbs, proteins, and vitamins B and C. They are also used to manufacture oil and pectin. Numerous illnesses and ailments can be treated with onions. The world's largest producer is India. With a production of 26.74 million tons and an average productivity of 18.65 t/ha, it accounts for 25.57% of the total global output (FAO, 2020). The area planted to onions increased by about three times between 1991–1992 and 2017–2018, but the yield increased by almost four times (Horticultural Statistics at a Glance, 2018). The top five states in terms of onion output (915.73 thousand MT) are Maharashtra (8854.09 thousand MT), Madhya Pradesh (3701.01 thousand MT), Karnataka (2986.59 thousand MT), Bihar (1240.59 thousand MT), and Andhra Pradesh. The top 10 states in India produce almost 90% of the nation's onions. Each state had a different production per hectare, with Gujarat leading the way at 24.25 t/ha and Odisha trailing behind at 10.77 t/ha. Many growers don't have adequate storage facilities; therefore, they bring onions straight to market after harvest. Most of the existing units are conventional and non-scientific, and the storage capacity is currently woefully inadequate. A month after harvest, farmers typically unload their entire stock due to the substantial losses in traditional storage structures. Because of the market's surplus, prices are therefore extremely low during this time. After then, prices start to climb rather quickly, and occasionally there are large changes, which makes both producers and customers unhappy. Furthermore, market intelligence did not foresee the knowledge of production losses during marketing and storage because crop scenarios were not timely foreseen.

Climate-related variables like temperature and moisture as well as storage management techniques, such as the kind of storage system chosen, the quantity and quality of products to be stored, the storage space, the aeration conditions, stock upkeep, the length of storage period, and the sale time, may be to blame for these losses (Berhanu and Berhanu, 2014). Therefore, it is necessary to measure the post-harvest losses in terms of both money and physical assets at various marketing phases and storage durations, as well as the degree to which they affect the net returns that onion growers receive and the producer's net share of the consumer's rupee. Farmers view onion production as less profitable due to all these problems. Keeping in view the above facts, this study was conducted with the following specific objective:

– To identify the constraints and to seeks suggestions from onion growers to overcome

MATERIALS AND METHODS

The current study was carried out in Odisha state. The state was divided into 10 zones based on agro-climatic characteristics, and the district from the western undulating zone,

Kalahandi districts, was purposively chosen since many farmers in these regions, like others in Odisha, cultivate onions throughout the winter season. Furthermore, the location, climatic conditions, and soil are ideal for onion cultivation. A total of 90 farmers (45 from Bhawanipatna block and 45 from Golamunda block) were selected at random and interviewed directly for the purpose of study of constraints in onion crop production, marketing, and storage during 2021-22. A multi-stage purposive sampling method was utilised to choose the ultimate sampling units for primary data collection. The information about the constraints faced by onion growers was gathered from selected respondents/onion growers as well as market intermediaries on various aspects of onion production, marketing, and storage, and ranked using the Garrett ranking technique for different constraints. Various rating scales have been created to directly evaluate attitudes (i.e., the individual is aware that their attitude is being examined). The Garrett ranking is commonly utilised. Garrett's ranking technique converts the order of constraints along with advantages into numerical scores. The main advantage of this method over simple frequency distribution is that constraints are organised according to their severity from the perspective of respondents (Zalkuwi et al 2015). As a result, the same number of responses to two or more limitations may have received different rankings. Garrett's formula for converting rankings to percentages is as follows.

$$\text{Per cent position} = \frac{100\times(R_i-0.5)}{N_J},$$

$$\text{where, } R_{ij} = \text{Ranking given for } i^{th} \text{ item by } j^{th} \text{ individualfarmer}$$

$$N_j = \text{Number of items ranked by } j^{th} \text{individual farmer}$$

The percentage position of each rank was converted into scores using the table provided by Garrett and Woodworth (1969). For each component, the scores of individual respondents were put together and divided by the total number of respondents who received scores. These mean scores for all constraints were sorted from highest to lowest, and the constraints were assigned ranks appropriately.

RESULTS AND DISCUSSION

The Garrett ranking technique has been applied to assess various factors impacting onion production among the respondents. As per the results from Table 1, it is evident that the onion growers in the Bhawanipatna and Golamunda blocks of Kalahandi district face numerous challenges and constraints. The study revealed that the top five most significant obstacles encountered by onion growers in these areas are labour problems for weeding

(75.47%), limited knowledge about improved varieties (74.59%), high labour costs (73.73%), ineffective and expensive weedicides (71.4%), and expensive seed costs (70.55%), among others during production. Other challenges such as insufficient knowledge about seedling treatment (68.79%), high expenses for pesticides (57.04%), inadequate understanding of recommended fertiliser doses (35.42%), difficulty in recognising pests and diseases (31.74%), delayed availability of fertiliser (31.52%), subpar quality of seeds (29.58%), and lack of knowledge about control measures (27.56%) were identified as limiting factors for onion cultivation in the study area. The results above were consistent with the results obtained by Shivam et al. (2023), Shukla et al. (2019), Vaishnavi Sangam, V. S., & Aski, S. G. (2018). These findings were also consistent with the previous research conducted by Sunil Kumar (2004), Ashok (2015), and Khating (2017).

Table 1. Constraints faced by onion growers during production of onion

Sl. No.	Constraints factors	Rank												Sampled size	Total score	Avg. Score	Rank
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII				
1	Lack of knowledge about improved varieties	55	11	10	9	5	4	2	0	0	0	0	0	96	7161	74.59	II
2	Lack of knowledge about seedling treatment	39	17	11	5	5	4	4	4	3	2	2	0	96	6604	68.79	VI
3	High cost of seed	43	15	11	6	6	2	5	5	3	0	0	0	96	6773	70.55	V
4	Poor quality of seed	0	0	0	1	1	3	4	7	11	15	21	33	96	2840	29.58	XI
5	Non-availability of fertilizer in time	0	0	0	3	4	4	5	5	11	12	23	29	96	3026	31.52	X
6	Lack of knowledge of recommended fertilizer doses	0	0	1	5	6	7	9	9	9	10	13	27	96	3400	35.42	VIII
7	Labour problem for weeding	59	10	9	8	5	4	1	0	0	0	0	0	96	7245	75.47	I
8	Less effective and costly weedicides	49	12	10	7	4	3	3	3	2	2	1	0	96	6859	71.45	IV
9	High cost of labour	47	23	14	1	0	4	3	2	1	1	0	0	96	7078	73.73	III
10	Difficulty in identifying the pest and diseases	1	1	1	1	1	2	8	8	10	11	22	30	98	3047	31.74	IX
11	Lack of knowledge about control measures	0	1	1	1	1	2	2	3	4	15	27	39	96	2646	27.56	XII
12	High cost of pesticides	19	10	8	7	6	6	9	9	9	8	3	2	96	5476	57.04	VII

Table 2. Constraints faced by onion growers during marketing of onion

Sl. No		Rank												Sampled size	Total score	Avg. Score	Rank
	Constraints factors	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII				
1	Low price at time of harvesting	70	15	9	2	0	0	0	0	0	0	0	0	96	7691	80.11	I
2	Open auction sale fetches low price for onion produce	29	19	16	10	8	6	4	4	0	0	0	0	96	6617	68.93	VII
3	Lack of infrastructure facility	17	11	13	6	9	7	5	7	7	5	5	4	96	5517	57.47	IX
4	Large distance from market	5	2	2	2	1	3	5	7	9	14	21	25	96	3399	35.41	XII
5	High transportation cost	52	18	8	6	5	0	5	2	0	0	0	0	96	7184	74.83	III
6	High fluctuation in market prices	51	25	8	5	2	2	1	2	0	0	0	0	96	7294	75.98	II
7	Lack of appropriate credit facilities	27	12	10	10	9	11	10	7	0	0	0	0	96	6278	65.40	VIII
8	Lack of market information/news	30	22	15	14	9	2	3	1	0	0	0	0	96	6766	70.48	V
9	Lack of storage facilities	51	6	8	1	0	4	20	6	0	0	0	0	96	6743	70.24	VI
10	Lack of knowledge about grading	3	2	5	5	3	8	8	2	10	10	12	30	98	3653	38.05	XI
11	Assembling problem	6	5	9	9	11	15	21	13	4	3	0	0	96	5246	54.65	X
12	Delay in payments	44	21	12	6	5	7	1	0	0	0	0	0	96	7079	73.74	IV

The data from Table 2 demonstrated the various obstacles faced by onion farmers during marketing in the Bhawanipatna and Golamunda blocks of the Kalahandi district. The study showed that the top six significant challenges experienced by these farmers were low prices at the time of harvesting (80.11%), high fluctuation in market prices (74.98%), high transportation costs (74.83%), delayed payments (73.74%), scarcity of market information and news (70.48%), and insufficient storage facilities (70.24%). Other challenges, such as open auction sales resulting in low prices for onion produce (68.93%), lack of appropriate credit facilities (65.40%), inadequate infrastructure facilities (57.47%), assembling difficulties (54.65%), lack of knowledge about grading (38.05%), and distant location from the market (35.41%), were also identified as limiting factors for onion growers. The results above were consistent with the study conducted by Shivam, et al. (2023), supported by Vaishnavi Sangam, V. S., and Aski, S. G. (2018). These findings were also consistent with the previous research conducted by Sunil Kumar (2004), Ashok (2015), and Khating (2017).

The suggestions provided by the respondents for overcoming the constraints they face in adopting improved technologies in onion cultivation are presented in Table 3. These suggestions include:

- The majority of respondents indicated that high market prices for their produce (82.00%) are a constraint, as onion crops are vulnerable to price fluctuations due to the wide variation in demand and supply in the market, timely availability of inputs at affordable prices (78.26%) was also identified as a challenge, as all farmers carry out the same operations during the same time of the season making it difficult to ensure input availability for all farmers at peak times,
- Most farmers (76.61%) suggested that having access to proper markets to sell their produce is essential, as factors such as the intervention of middlemen, loss of quality during storage and transport, and other market dynamics can result in lower prices for their produce.
- The availability of efficient credit facilities to cover crop production expenses was identified as a constraint by most farmers (75.54%). This is because onion is a highly price-sensitive crop, and farmers may be uncertain about the profit or loss they will incur after selling their final produce, making credit facilities crucial to helping them manage any potential financial losses.

Table 3. Suggestions by onion growers to overcome constraints

Sl. No.	Constraints factors	Rank										Sampled size	Total score	Avg. Score	Rank
		I	II	III	IV	V	VI	VII	VIII	IX	X				
1	Availability of sufficient and timely credit facilities	58	22	10	3	2	1	0	0	0	0	96	7252	75.54	IV
2	Demonstration of package of practices needs to be done	19	18	15	13	9	8	6	4	2	2	96	5863	61.07	IX
3	Facilities for proper storage	31	18	14	12	8	6	4	2	1	0	96	6355	66.20	VII
4	High market price for produce	96	0	0	0	0	0	0	0	0	0	96	7872	82.00	I
5	More subsidized supply of inputs	40	20	10	8	7	6	5	0	0	0	96	6636	69.13	VI
6	Proper marketing facilities	63	24	4	2	2	0	0	1	0	0	96	7355	76.61	III
7	Provision of extra incentives to onion growers	27	18	12	7	6	4	4	6	8	4	96	5834	60.77	X
8	Provision of training programmes	24	19	16	10	8	6	4	4	2	3	96	6018	62.69	VIII
9	Timely input availability at cheaper rate	70	20	5	1	0	0	0	0	0	0	96	7513	78.26	II
10	Usage of labour-saving improved implements	43	18	14	8	6	5	2	0	0	0	96	6768	70.50	V

- ❖ A sizable portion of farmers (70.50%) recommended using labour-saving upgraded tools to deal with labour scarcity to get around it at the agricultural production peak.
- ❖ Low-income farmers suggested suggestions such as providing a greater subsidised supply of inputs (69.13) to overcome their lack of resources.
- ❖ In addition to these suggestions, farmers should have facilities for safe storage to guard against damage to their crop, as onions are perishable (66.20).
- ❖ Training programs regarding better production techniques should also be provided (62.69),
- ❖ A package of practices that need to be demonstrated (61.07) and
- ❖ Additional incentives should be given to onion growers (60.77).

The results above were consistent with those of Laxmi (2017), Roman (2015), Vaishnavi Sangam, V. S., & Aski, S. G. (2018), and Shivam et al. (2023).

CONCLUSIONS AND RECOMMENDATIONS

The current research study was carried out for sustainable onion production in the study area. It focused on the main difficulties encountered by growers during production and selling, as well as the recommendations made by the respondents to get over those difficulties while adopting new technologies. The study found that during onion production, the top five biggest challenges faced by onion growers were labour issues related to weeding, followed by ignorance of improved varieties, high labour costs, expensive and ineffective weedicides, high seed costs, etc. The study also found that the biggest challenges faced by onion growers were low prices at harvest time, which were followed by high price fluctuations, high transportation costs, payment delays, a lack of market information and news, a lack of storage facilities, etc. in the study area. Recent years have seen a tremendous advancement in agricultural technologies, which has increased the chance for onion growers to reap greater financial rewards. However, some of the previously mentioned barriers have made the adoption of modern agricultural technologies sluggish. The following suggestions were made considering the conclusions mentioned above:

- The agriculture department ought to take the lead in educating farmers about enhanced cultivars and production techniques (such as storage and pre- and post-harvesting technology) so that farmers may sell their food at a premium and at the right time. Since the anticipated market price of onions will likely be greater in this instance and thus balance the storage cost, the cost-benefit ratio is likely to be more favourable.
- These limitations deter onion growers from using good farming practices and intensive production, which lowers productivity and causes dissatisfaction among farmers and

traders. Onions are also a perishable and extremely price-sensitive agricultural product. The huge variation in pricing finally hurt the economics of respondents; consequently, the government needs to make suitable preparations for storing substantial quantities of the onion harvest. This can be minimised by the intervention of the government, developmental agencies, marketing boards, and NAFED by giving timely market information and building the market infrastructure at the taluk and district levels to enable an efficient marketing system for the output. Farmers may benefit from prompt government agency action, such as prolonging or announcing a government support price for onions, which may help farmers overcome the problem of price fluctuation.

- At the tehsil level, it is advised that a wholesale or terminal market be established. In addition to giving the onion farmer a closer market for his produce, this will significantly reduce marketing expenses. By taking this action, producers will have a permanent facility nearby, and there may be further advantages in the form of improved market connections, opportunities for storage inside the production area, and potential contracts.
- For farmers to minimise losses, they must receive training on modern storage technologies.
- It might be challenging for farmers to grow their crops on small and medium-sized farms because it costs a lot of money. It is possible to prioritise lowering input costs through subsidies.
- It is recommended that extension agents maintain constant communication with farmers during the harvest seasons.

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