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Technological gaps in onion production: An analytical study of growers in Chitradurga district, Karnataka

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Abstract
Onions are one of the most important vegetables in India, occupying a prominent role in both domestic consumption and export earnings. India ranks second in onion production in the world, and the crop is important for food security and generating farm incomes. Within India, one of the leading producing states of onions is Karnataka, which contributes significantly to the area and production of onions. Especially within Karnataka, Chitradurga district has emerged as a major onion growing belt in the state. onion production within the district has suffered from technological gaps that discourage productivity and profitability. This study was then developed to know the need for such technology gaps among onion farmers within Chitradurga district. An ex-post facto research design was developed, and questionnaires were administered among onion farmers selected from leading onion-growing villages, followed by the selection of 120 farmers were used for the study. The findings showed that small (46.66%) farmers and big (40.00%) farmers identified technological gaps at medium to high gaps with small producers facing the highest discrepancies when producing onions. The greatest number of gaps among the farmers coincided with the use of plant growth promoters, applications of micronutrients and considerable adoption of intercropping. The basis of these gaps was a lack of knowledge of the new technology, poor contact with extension and consultative services and non-availability of these products.

Keywords: Onion production, technological gaps, farmers

Introduction
Onions are one of the world's most important and valuable vegetable crops, as both an edible item and an economic commodity. In India, onions are more important cooking ingredient, they are also considered a necessary vegetable for every household, as well as important and sellable goods at the national and export levels. In addition to being a household food essential, onion production also provides millions of farmers with their livelihoods, helps to create rural agricultural jobs, and is a significant contributor to agricultural exports.

Horticulture in India has grown rapidly and now contributes approximately 30 percent of agricultural gross domestic product while reckoning for only slightly more than 1 percent of cropped land. Of all of the horticultural items, onions are one of the major vegetable crops. India is actually the second world leader in onion output with an estimated output of almost 25 percent of the world total output. The area planted for onion production is approximately 19.41 million hectares, with an estimated onion crop output of 31.68 million metric tons. The leading onion production state is Maharashtra; but Karnataka, Madhya Pradesh, Rajasthan, and Gujarat produce significant amounts of onions as well. Karnataka is second among states as an onion producer in the country. In the 2015-2016 growing season, Karnataka produced onions on 2.31 lakh hectares with a production of 27.79 lakh tons (Anon, 2016) [1]. The onions growing area has increased slightly in the last ten years. Vijayapura district, which has the largest area and production, is one of the main onion-growing districts and Chitradurga district ranked second for production (7.83 lakh tons) in 38,110 hectares. Onion is cultivated in all three seasons of the year, but a larger area is cultivated during kharif season in the state. As critical as onion is to the economy and consumer preferences, there are severe challenges to greater productivity. After harvest, farmers who lack storage often begin selling their crops to pay off their debts. Following a bumper crop, the final effects may result in notable price reductions (both shortages and surpluses).

On the other hand, when production is low, farmers may profit from highly significant price increases, which puts more of a burden on consumers as they become more resistant to rising prices and high inflation in the global economy. Furthermore, farmers are unable to compete globally and appear to be bound with poor-performing local varieties, traditional methods, and a tenacity in using limited agricultural inputs without increasing productivity. stabilising incomes in a farm economy-based system in India will allow us to begin to retain our place as the world's largest producer of onion

Methodology

An 'ex-post facto' research design was employed for this investigation. Ex-post facto research is a methodical empirical investigation in which the independent variables are not directly impacted because they have already happened or are unalterable by nature. the Chitradurga district in Karnataka is one of the state's top onion-producing districts, it was purposefully chosen as the study area. Challakere and Hiriyur taluks were chosen especially because produced the most onions and have the largest area. Six villages from each taluk were selected where the farmers grow a lot of onions. From each village, five small onion growers and five big onion growers were selected. Thus, from each selected taluk, thirty small and thirty big farmers were selected by using simple random sampling. The total sample constituted from two taluks was 120.

Technological gap: It defined as the difference between the recommended practices and the technologies actually adopted by farmers at the field level. For each major practice, the extent of the gap was assessed using a three-point continuumviz. "Full gap", "Partial gap" and "No gap" with the scores of 3, 2 and 1, respectively. For every practice, the mean and total scores were calculated and the mean scores were used to assign ranks.

The technological gap was calculated using the formula:

$$Xg = Xr - Xa$$

Where

- Xg = Technological gap
- Xr = Recommended technology
- Xa = Technology actually adopted by farmers

Farmers were further divided into three groups based on their scores, with the mean and standard deviation act as classification indicators.

Results and Discussion

Technological gaps of small and big farm onion growers

Technological gaps in the production of onions. Among the technologies listed, the use of plant promoter's places in first, followed by intercropping (ranked II) and the use of micronutrients (ranked III). This could be the result of insufficient knowledge about the availability of inputs like micronutrients and plant promoters in the study area. Because it requires additional resources like labour, equipment and seeds, farmers are unwilling to implement a suitable intercropping system. Some farmers may be unwilling to implement intercropping because they are worried that major crop yields will be lower and small or resource-poor farmers may lack the funds to invest in these inputs. Further, gap was identified in FYM application (Rank IV), split application of nitrogen (Rank V), weed management (Rank VI), chemical fertilizers application (Rank VII). This is because of poor knowledge about application of FYM and chemical fertilizers and non-availability of FYM. Now a days farmers are not maintaining as much cattle's population as compare to earlier days and also, they are applying to other horticultural crops like arecanut. Majority of onion farmers had exceeded the recommended quantities of nitrogen, phosphorus, and potassium fertilizers in their applications. Growers cited the reason for this behaviour as the belief that using more fertilizer would result in higher yields.

Management of cutworms (Rank VIII), management of alternaria blight (Rank IX), seed rate (Rank X), management of thrips (Rank XI), Purple blotch management (Rank XII), spacing (Rank XIII) this is due to farmers have shown a tendency to use chemical concentrations that exceeded the recommended levels, often lacking the necessary knowledge and guidance for their proper application. This practice poses a significant risk, potentially leading to pest resurgence. Additionally, it has been noted that a substantial number of farmers are unfamiliar with the distinctions between insecticides and fungicides. It was also noted that the majority of farmers lacked awareness of the recommended seed rates and some individuals who were aware of the recommended seed rate displayed negligence in its implementation due to non-availability of quality seeds at reasonable cost at local market. Minor technological gaps were identified in the practices like irrigation interval (Rank XIV), seed treatment (Rank XV), sowing method (Rank XVI), using varieties/hybrids (Rank XVII) and sowing time (Rank XVIII). Most of the farmers use private hybrids for sowing as these seeds are already treated by chemicals, hence they have not treated seeds. Majority of the onion growers follows recommended sowing method and sowing time this might be attributed to farmers' awareness of these aspects, owing to their extensive experience in onion cultivation. No technological gap was noted in relation to the harvesting stage or timing (Rank XIX). This may be because of the reason that vast experience of respondents in onion cultivation.

Overall technological gaps among small and big farm onion growers

Overall technological gap of small and big farm onion growers. More than two fifth of small onion farmers had medium (46.66%) level of technological gap, followed by high level (38.34%) to low level (15.00%) of technological gap. In case of big onion farmers one third (33.33%) of the growers belongs to low technological gap followed by two fifth (40.00%) of them under medium level of technological gap and more than one fourth (26.67%) of them under high technological gap. When the pooled sample was taken into consideration, 43.34 percent, 32.50 percent and 24.16 percent of onion growers possessed medium, high and low level of technological gap respectively. Higher technological gap (38.34%) was found in case of small farmers compared to big farmers (26.67%). With chi square value of 11.59 showed that technological gap of onion growers was significant at five percent.

Lack of knowledge about better farming practices, a lack of motivation and commitment to implementing novel techniques and challenges obtaining necessary inputs could be the probable reasons. Regardless of the size of their land holdings, the majority of respondents have chosen to use simple farming methods. The grower's moderate level of adoption with the suggested practices may be the reason for the medium technological gap between them. This demonstrates the huge opportunity for increasing up extension initiatives to boost onion production. This emphasizes the need for the relevant extension agency to increases its extension efforts in order to raise awareness of the adoption of recommended cultivation practices and eventually bridge the technological gaps.

Table 1: Technological gap of small and big farm onion growers

(n=120)

Sl. No	Recommended Technologies	Small farm growers (n1=60)		Big farm growers (n2=60)		Onion growers	
		Mean	Rank	Mean	Rank	Mean	Rank
1.	Sowing time	1.01	XVI	1.01	XVII	1.01	XVIII
2.	Sowing method	1.10	XV	1.14	XV	1.14	XVI
3.	Varieties/Hybrids	1.10	XV	1.03	XVI	1.06	XVII
4.	Seed rate	2.10	X	1.90	X	2.00	X
5.	Seed treatment	1.26	XIII	1.16	XV	1.25	XV
6.	Spacing	1.51	XII	1.38	XIV	1.45	XIII
7.	FYM application	2.34	IV	2.20	III	2.27	IV
8.	Split application of Nitrogen	2.28	VI	2.12	V	2.20	V
9.	Chemical fertilizers application	2.20	VII	2.00	VI	2.10	VII
10.	Micronutrients	2.38	III	2.21	II	2.30	III
11.	Inter cropping	2.46	II	2.18	IV	2.32	II
12.	Irrigation interval	1.25	XIV	1.53	XIII	1.39	XIV
13.	Plant promoter application	2.55	I	2.30	I	2.42	I
14.	Weed management	2.30	V	1.98	VII	2.14	VI
15.	Insect management						
	a. Cutworm	2.18	VIII	1.93	IX	2.06	VIII
	b. Thrips	2.10	X	1.88	XI	1.98	XI
16.	Disease management						
	a. Purple blotch	2.05	XI	1.81	XII	1.93	XII
	b. Alternaria blight	2.12	IX	1.96	VIII	2.04	IX
17.	Harvesting time	1.00	XVII	1.00	XVIII	1.00	XIX

Table 2: Overall technological gap of small and big farm onion growers

(n=120)

Technological gap	Small farm growers (n_1=60)		Big farm growers (n_2=60)		Onion growers (n=120)		$\chi 2$ value
	No.	%	No.	%	No.	%	
Low gap (< 32.44)	09	15.00	20	33.33	29	24.16	11.59*
Medium gap (32.44-35.82)	28	46.66	24	40.00	52	43.34	
High gap (> 35.82)	23	38.34	16	26.67	39	32.50	
Mean = 34.13 SD = 3.39							

*-Significant at five percent level of significance

Conclusion

The study found that big and small farm growers in the Chitradurga district had major technological gaps with respect to onion cultivation. The application of micronutrients, intercropping, plant growth promoters and recommended applications of fertilisers and farmyard manure were the main areas of disparity. These differences were mostly attributed to a lack of knowledge, limited input availability, financial limitations and inaccurate information about input usage. Significant gaps were also seen in pest and disease management techniques, frequently as a result of farmers lack of knowledge of the proper use of chemicals and misunderstanding of the difference between fungicides and insecticides. Overall, it was found that the respondents most often had a medium level of technological gap. Small farmers were prone to obstacles in knowledge, resources and input accessibility as evidenced by the greater gap they experienced compared to big farmers. Additionally, the results showed that the technological gap was statistically significant, showing how important it is in affecting productivity. According to the findings, well-planned extension programs are crucial for raising farmers awareness and enabling them to adopt better practices. Technology gaps could be significantly closed by improving the supply of high quality inputs, encouraging integrated farming methods and offering specialised training. By bridging these gaps, onion production can be improved, leading to better farm profitability and enhanced livelihood security of growers.

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References

1. Anonymous. Department of Horticulture, Government of Karnataka. Bengaluru: DoH; 2016. p. 1-120.
2. Agarwal N. A study on adoption behaviour of onion growers in relation to their socio-economic and psycho characteristics in Sehore district, Madhya Pradesh [MSc thesis]. Gwalior: Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya; 2013. p. 1-150.
3. Goudappa SB, Biradar GS, Bairathi R. Technological gap in chilli cultivation perceived by farmers. Rajasthan J Extn Educ. 2012;20:171-174.
4. Kulkarni NP, Jahagirdar KA. Technological gap in recommended rose cultivation practices in Dharwad district, Karnataka. Karnataka J Agric Sci. 2015;28(3):381-384.
5. Lekhanath. A study on technological gap and marketing behaviour of pomegranate growers in Koppal district of Karnataka [MSc thesis]. Raichur: University of Agricultural Sciences; 2016. p. 1-140.
6. Singh RP, Awasthi N. Technology gap in potato cultivation in district Kannauj. Indones J Pure Appl Biol. 2018;7(4):469-472.
7. Varadaraju GM, Mangalvedkar R, Gowda CN. Adoption of production technologies by tomato growers: An analysis. J Extn Educ. 2009;21(3):4256-4260.
8. Vijayraj DM, Shivalingaiah YN, Pujar SS, Pankaja HK. Bridging the technological gap: Enhancing sunflower production in Chamarajanagar district, Karnataka. Int J Adv Biochem Res. 2024;8(10):1220-1223.
9. Vinay Kumar R, Natikar KV, Pankaja HK, Nataraju MS, Dhananjaya B. Study on adoption of improved cultivation practices by rose growers in Karnataka. Mysore J Agric Sci. 2009;43(2):340-343.
10. Yadav S, Rai DP, Tripathi UK. Technological gap in different practices among chickpea growers in Satna district of Madhya Pradesh. J Pharmacogn Phytochem. 2020;9(2):1809-1813.