

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 10; October 2025; Page No. 01-08

Received: 01-07-2025
Accepted: 05-08-2025

Indexed Journal
Peer Reviewed Journal

An analysis of economic performance of pomegranate growers under National Horticulture Mission (NHM) in Chikkaballapura and Chitradurga districts of Karnataka

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DOI: <https://www.doi.org/10.33545/26180723.2025.v8.i10a.2501>

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Abstract

The present study was conducted to analyze the economic performance of pomegranate growers under National Horticulture Mission (NHM). About 88.33 percent overall beneficiaries fall under medium level of economic performance and overall 36.67 percent of non-beneficiaries belongs to medium level of economic performance. With respect to average cost and return analysis of beneficiary NHM pomegranate growers, the overall average net returns were Rs.405295.10 per acre with returns/rupee of expenditure of 3.55 respectively. The non-beneficiary of NHM pomegranate growers, the overall average net returns were Rs.169119.85 per acre with returns/rupee of expenditure of 2.73 respectively. The results indicated that the NHM scheme has had a positive economic impact, with most beneficiaries experiencing moderate income improvement. It showed that, in Chikkaballapura has a slightly higher proportion of low performers compared to Chitradurga district, though the differences in medium and high performance were relatively small. The findings highlighted the importance of improving economic performance and outreach efforts for to increase their participation and get benefit from NHM and improve their economic performance for better scheme implementation and spread of positive impact of the NHM.

Keywords: Economic performance, pomegranate growers, National Horticulture Mission (NHM), implementation

1. Introduction

In India's economy, Agriculture sector plays an important role and serving as the largest and most significant economic industry and the primary source of income for the majority of the population. It remains the backbone of employment and sustenance for many Indians even today. According to the 2011 Census, approximately 54.6% of the country's population was engaged in agriculture and it's allied activities. Recognizing the importance of agriculture as major income generating sector, the Government of India has implemented numerous programmes and initiatives to support and develop the sector. These initiatives and programmes aim not only to enhance agricultural productivity and also to increase farmers' incomes. Over the years, the contribution of agriculture to the Indian economy has been progressively rising. In terms of horticultural crops, states such as Karnataka, Maharashtra, Andhra Pradesh, Kerala, and West Bengal hold prominent positions in terms of area and production. Karnataka accounts for 8.4% of area under horticultural crops and contributes only

6.8% to total production, ranking 18th in productivity in India.

The National Horticulture Mission (NHM) was launched in 2005-06 by the Department of Agriculture and Cooperation under the Ministry of Agriculture, Government of India. This scheme aims for the holistic development of the horticulture sector by establishing forward and backward linkages between all stakeholders, including farmers and private entrepreneurs. The mission covers all states and three Union Territories (Andaman and Nicobar Islands, Lakshadweep, and Puducherry) except for the eight North-Eastern states, including Sikkim and the states of Jammu & Kashmir, Himachal Pradesh and Uttarakhand. These regions are covered under a separate programme, the Horticulture Mission for North East and Himalayan States (HMNEH). Currently, out of the 483 districts in the 18 states and three Union Territories, NHM is operational in 384 districts. From 2014-15 onwards, the National Horticulture Mission (NHM) is sub-scheme under Mission for Integrated Development of Horticulture (MIDH) started to harness the

full potential of horticulture across states by enhancing the production of fruits, vegetables, flowers, spices, medicinal plants and other horticultural products.

The NHM scheme was implemented in Karnataka on June 30, 2005, in two phases. Initially, 15 districts were included in the first phase during 2004-05. These districts were Bangalore (Urban), Bangalore (Rural), Tumkur, Kolar, Chitradurga, Hassan, Mysore, Kodagu, Udupi, Dakshina Kannada, Belgaum, Bijapur, Bagalkot, Gulbarga and Koppal. Subsequently, in 2015-16, the scheme was extended to the remaining 15 districts viz., Chikkaballapur, Ramanagara, Mandya, Chamarajnagar, Chikkamagaluru, Shivamogga, Davangere, Haveri, Uttara Kannada, Dharwad, Gadag, Bellary, Bidar, Raichur and Yadgir covering all 30 districts in Karnataka. NHM initiatives have focused on 16 key horticultural crops, including mango, grapes, pomegranate, banana, pineapple, cashew, cocoa, pepper, ginger, aromatic plants, and flowers. The mission supports horticultural farmers in post-harvest management, processing and marketing. Among fruit crops, pomegranate has shown remarkable progress. In 2017-18, pomegranate cultivation spanned 25,967 hectares, yielding 268,228 metric tonnes. By 2021-22, the area increased to 27,693 hectares, with a production of 302,451 metric tonnes, contributing 3.60% to Karnataka's fruit crop output. This upward trend has made the pomegranate as important perennial fruit crop in Karnataka.

In Karnataka, pomegranate cultivation spans 28.09 thousand hectares, with a production accounts to 328.92 thousand metric tonnes with an average fruit yield of 11.71 metric tonnes per hectare, slightly same and above average of 11.70 metric tonnes. Major pomegranate producing districts are Chitradurga, Tumkur, Koppal, Bagalkot, Bijapur, Raichur, Belgaum, Bellary and Dharwad. Despite these increase in area and production, the studies highlight significant potential improve in yield. Challenges in achieving optimal production include gaps in grower knowledge, technological adoption and market access. The implementation of NHM in Karnataka, to analyze their economic performance duet to implementation of the scheme Understanding these factors and addressing challenges for further improving. This present study aimed and analyzed the economic performance of pomegranate growers in Karnataka.

2. Methodology

The present study was taken up during 2023-24 to analyse the economic performance of beneficiaries and non-beneficiaries in Chikkaballapura and Chitradurga districts under the National Horticulture Mission (NHM) scheme. This study was purposively carried out in Chitradurga and Chikkaballapura district of Karnataka State. As NHM is wide spread in all the districts of Karnataka state, Chitradurga was selected as NHM was started first in that region and Chikkaballapura district was selected based on its wide spread activities in this region because NHM was started in second phase in this district. These two districts were purposively selected for the study as the number of beneficiary pomegranate growers were more in these districts. The ex-post facto design was used. The selection of respondents was by following simple random sampling

technique has been employed for the selection of respondents of pomegranate growers from Chitradurga and Chikkaballapura. From each district 60 beneficiaries and 30 non-beneficiaries were selected. which constituted the total sample size of 180 pomegranate grower respondents. The data were collected from the respondents through personal interview method using pre-tested and well-structured schedule. The economic performance of the beneficiary and non-beneficiary respondents were categorized in to three category viz., three levels of economic performance based on income: Low, Medium and High. The statistical tools used for the investigation were Frequency, Percentage, Mean, Standard Deviation and Rank were used for the study.

3. Results

3.1 Overall Economic Performance of beneficiary pomegranate growers of NHM

The table 1 provides the economic performance of beneficiaries in Chikkaballapura and Chitradurga districts under the National Horticulture Mission (NHM) scheme. The data was categorized into three levels of economic performance based on income: Low, Medium and High.

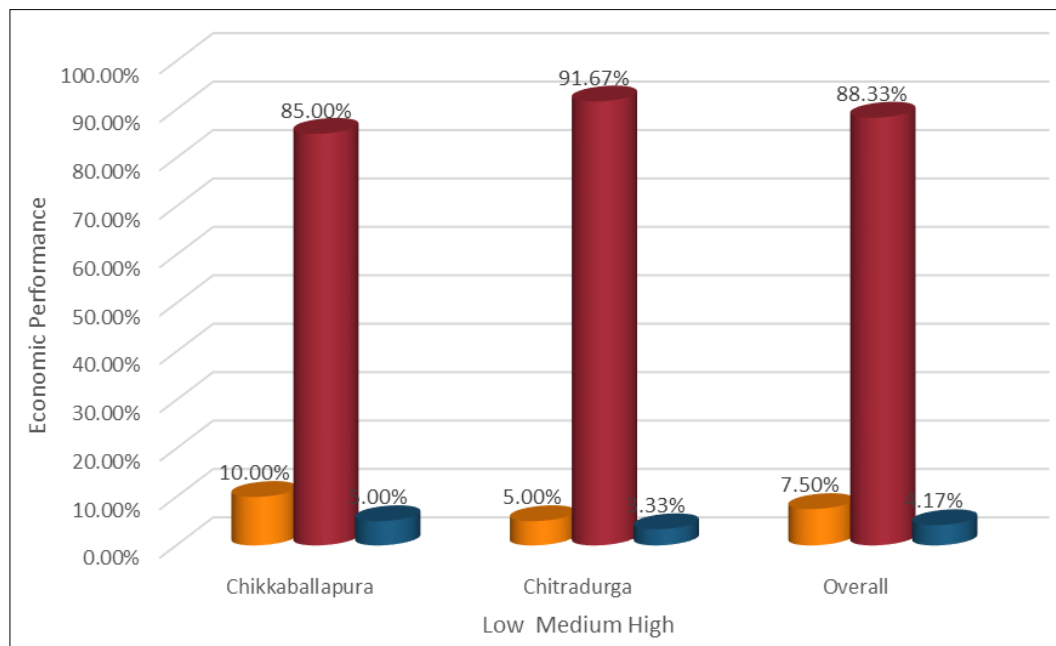
In Chikkaballapura district, the economic performance of beneficiaries under the NHM scheme showed a distinct distribution. A small proportion of beneficiaries, only 10.00 percent, fall under the low performance category, earning below rupees 156,022.99, indicating that most beneficiaries are earning enough to be classified as medium or high performers. The majority 85.00 percent of beneficiaries fall under the medium performance category, with incomes ranging between rupees 156,022.99 and 654,567.29, suggesting that most beneficiaries were achieving moderate economic success through the scheme. Only 5.00 percent of beneficiaries fall under the high-performance category, earning above rupees 654,567.29, signifying that the scheme benefits many, only a few have seen exceptional economic gains.

In Chitradurga district, the economic performance is slightly different. Only 5.00 percent of beneficiaries are classified as low performers, a smaller proportion compared to Chikkaballapura. A large portion 91.67 percent of beneficiaries, fall under the medium-performance category, similar to Chikkaballapura, indicated moderate income improvement for the majority. Just 3.33 percent of beneficiaries in Chitradurga are classified as high performers, which is comparable to Chikkaballapura, suggesting that only a small subset of farmers in both districts achieved exceptional success.

Across both the districts 7.50 percent of beneficiaries fall under the low-performance category, reflecting that most beneficiaries were able to generate some income from the scheme. The majority 88.33 percent of beneficiaries, fall under the medium-performance category, indicated that the NHM scheme was generally effective in improving the income of most beneficiaries. However, only 4.17 percent of beneficiaries had achieved high economic performance, suggesting that the scheme's impact on generating high-income earners and a few beneficiaries reaching a high economic threshold.

Table 1: Overall Economic Performance of beneficiary pomegranate growers of NHM in Chikkaballapura and Chitradurga (n=120)

Economic Performance	Category	Chikkaballapura Beneficiaries (n ₁ =60)		Chitradurga Beneficiaries (n ₂ =60)		Overall Total Beneficiaries (n=120)	
		f	%	f	%	f	%
Mean=405295.14 SD= 498544.31	Low (<156022.99)	6	10.00	3	5.00	9	7.50
	Medium (156022.99-654567.29)	51	85.00	55	91.67	106	88.33
	High (> 654567.29)	3	5.00	2	3.33	5	4.17

**Fig 1:** Overall Economic Performance of beneficiary pomegranate growers of NHM

The results indicated that the NHM scheme has had a positive economic impact, with most beneficiaries experiencing moderate income improvement. Regional differences between Chikkaballapura and Chitradurga district show that Chikkaballapura has a slightly higher proportion of low performers compared to Chitradurga district, though the differences in medium and high performance were relatively small. These variations could reflect regional economic conditions, the local implementation of the scheme, or the types of horticultural activities prevalent in each district.

3.2 Overall economic performance of non-beneficiary pomegranate growers of NHM

The table 2 presents the economic performance of non-beneficiaries in Chikkaballapura and Chitradurga districts. The data was categorized into three levels of economic performance based on income. Low, Medium and High.

In Chikkaballapura, the economic performance of non-beneficiaries showed a varied income distribution. A quarter of non-beneficiaries (23.33%) individuals, fall under the low-performance category, earning below rupees 266,370.22. This suggests that a significant portion of non-beneficiaries might be experiencing economic hardship, struggling to improve their financial situation without the support of the NHM scheme. The majority 56.67 percent of non-beneficiaries, fall into the medium performance category, earning rupees between 266,370.22 and 410,109.27, reflecting moderate income levels. A smaller proportion 20.00 percent of non-beneficiaries fall into the high-performance category, earning above rupees

410,109.27. These individuals were likely benefiting from factors such as larger farm sizes, better access to resources, or diversified income sources.

In Chitradurga, the economic performance of non-beneficiaries followed a similar pattern but with some regional differences. A higher percentage (33.33%) of non-beneficiaries fall under the low-performance category, which is more than the 23.33 percent seen in Chikkaballapura. This suggested that non-beneficiaries in Chitradurga might face more significant economic challenges. On the other hand, 50.00 percent of non-beneficiaries fall under the medium performance category, similar to Chikkaballapura district, indicated that most non-beneficiaries in Chitradurga were earning moderate incomes. Only 16.67 percent of non-beneficiaries in Chitradurga reach the high-performance threshold, which was a smaller proportion than in Chikkaballapura district.

Overall, across both the districts 28.33 percent of non-beneficiaries fall under the low-performance category, indicated that a substantial number of non-beneficiaries were earning low incomes and might face challenges in improving their economic conditions. A larger portion about 36.67 percent of non-beneficiaries fall under the medium performance category, reflecting moderate economic success. The high-performance category consists of 18.33 percent non-beneficiaries suggested that while some non-beneficiaries were economically successful, this was still a minority group. The economic performance of non-beneficiaries without NHM support reflects that many were able to sustain moderate incomes, as evidenced by the larger proportion in the medium-performance category. However,

a significant proportion, especially in Chitradurga (33.33%), fall under the low-performance category, highlighting gaps in support for these farmers. This suggested that non-

beneficiaries might be lacking the necessary resources, knowledge, or access to markets that would allow them to improve their economic outcomes.

Table 2: Overall economic performance of non-beneficiary pomegranate growers of NHM (n=60)

Economic Performance	Category	Chikkaballapura Non-Beneficiaries (n ₁ =30)		Chitradurga Non-Beneficiaries (n ₂ =30)		Overall Total Non-Beneficiaries (n=60)	
		f	%	f	%	f	%
Mean=338239.74 SD=143739.05	Low (<266370.22)	7	23.33	10	33.33	17	28.33
	Medium (266370.22-410109.27)	17	56.67	15	50.00	22	36.67
	High (>410109.27)	6	20.00	5	16.67	11	18.33

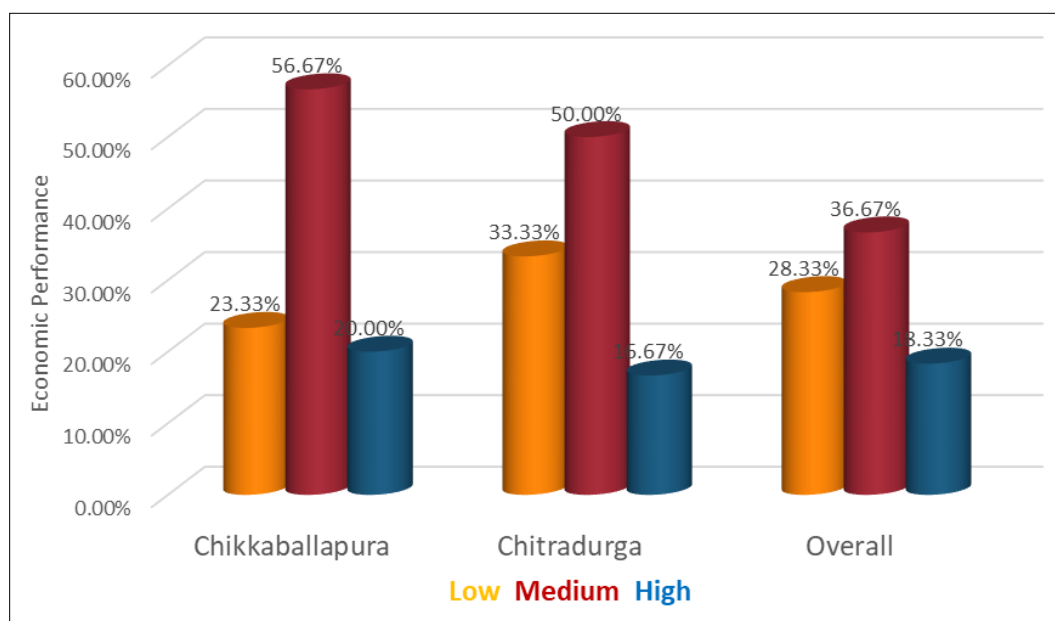


Fig 2: Overall Economic Performance of non-beneficiary pomegranate growers of NHM

The difference between the districts was most noticeable in the low-performance category, where Chitradurga district has a higher proportion compared to Chikkaballapura district. This could reflect variations in local agricultural practices, soil quality, market access, or the availability of irrigation facility and other resources. Additionally, the proportion of high performers among non-beneficiaries is relatively low in both the districts, in Chikkaballapura and in Chitradurga, indicating that some non-beneficiaries were economically successful, most are not reaching the higher income levels seen among NHM beneficiaries.

3.3 Average cost and return analysis of beneficiary pomegranate growers of NHM

The table 3 presents the economic performance of beneficiaries from Chikkaballapura and Chitradurga districts, covering key variables like average yield, cost of production, gross returns, net returns and returns per rupee of expenditure.

3.3.1 Average yield (Quintal per Acre)

In Chikkaballapura, the average yield was 4,555.33 quintals per acre, which was higher than that of Chitradurga. This suggested that beneficiaries in Chikkaballapura had a higher productivity level per acre, which might be attributed to factors like better access to irrigation facilities, more advanced farming practices, or favorable soil conditions. Whereas Chitradurga, the average yield was 3,983.97

quintals per acre, which was lower compared to Chikkaballapura district. This could be due to a various factors such as poorer land quality, less efficient farming techniques, or challenges with irrigation systems. Finally, the overall average yield for beneficiaries across both the districts was 4,269.65 quintals per acre, indicated an average level of productivity that reflects the combined results from both districts

3.3.2 Average cost of production (Rupees per Acre)

In Chikkaballapura, the average cost of production is ₹1,77,213.20 per acre, which was higher than Chitradurga. This could be due to higher input costs such as labor, fertilizers, and other production inputs. In Chikkaballapura district, the higher yields might be associated with higher initial costs for better resources or technology. Whereas in Chitradurga, the average cost of production was ₹1,49,593.80 per acre, which was lower than Chikkaballapura.

This might indicate that while the costs of production in Chitradurga were relatively more affordable, they might not result in as high a yield, thus leading to a less efficient cost-to-output ratio and finally Overall, the average cost of production across both districts was ₹1,63,403.50 per acre, providing a middle ground between Chikkaballapura and Chitradurga district. This suggested a moderate level of production costs across the both regions.

3.3.3 Average gross returns (Rupees per Acre)

In Chikkaballapura district, the average gross return was ₹6,28,675.71 per acre, which was significantly higher than Chitradurga district. This indicates that the beneficiaries in Chikkaballapura were earning better gross returns, likely due to higher yields per acre and possibly higher market prices for their produce. Whereas, Chitradurga the average gross return is ₹5,08,721.56 per acre, which was lower compared to Chikkaballapura district. The discrepancy might be attributed to the lower yield in Chitradurga, which impacts the overall revenue generated from production. Finally, the overall gross return across both the districts is ₹5,68,698.64 per acre, representing a balance between the higher returns from Chikkaballapura district and the more moderate returns from Chitradurga district.

3.3.4 Average net returns (Rupees per Acre)

In Chikkaballapura, the average net return is ₹4,51,462.50 per acre, which was higher than that of Chitradurga. This suggested that after deducting production costs, the beneficiaries in Chikkaballapura were earning significantly more net income. The higher yields and gross returns in Chikkaballapura likely contribute to these better net returns. Whereas, Chitradurga the average net return was ₹3,59,127.70 per acre, which was lower than Chikkaballapura but still significant. The lower yield and gross returns in Chitradurga contribute to these comparatively smaller net returns and finally the overall average net return is ₹4,05,295.10 per acre, indicating a reasonable level of net income across both the districts, though Chikkaballapura shows a higher profitability margin for beneficiaries.

Table 3: Average cost and return analysis of beneficiary pomegranate growers of NHM (n=120)

Particulars	Chikkaballapura Beneficiaries (n ₁ =60)	Chitradurga Beneficiaries (n ₂ =60)	Overall Beneficiaries (n=120)
Average Yield (Quintal/acre)	4,555.33	3,983.97	4269.65
Average Cost of Production (Rs./acre)	1,77,213.2	1,49,593.8	163403.5
Average Gross returns (Rs./acre)	6,28,675.71	5,08,721.56	568698.635
Average Net returns (Rs/acre)	4,51,462.5	3,59,127.7	405295.1
Returns/Rupee of expenditure	3.63	3.47	3.55

3.3.5 Returns per rupee of expenditure

In Chikkaballapura, the returns per rupee of expenditure was 3.63, the highest among the two districts. This means that for every rupee spent on production, Chikkaballapura beneficiaries receive ₹3.63 in returns, indicating a highly efficient and profitable farming practice. While in Chitradurga, the returns per rupee of expenditure was 3.47, which was slightly lower than Chikkaballapura but still

signifies relatively good economic performance. The relatively lower yield and gross returns in Chitradurga district lead to this slightly less efficient return-to-expenditure ratio. The overall return per rupee of expenditure was 3.55, reflecting a good level of profitability across both the districts. This means, on average, for every rupee spent, beneficiaries across both districts were receiving about ₹3.55 in return.

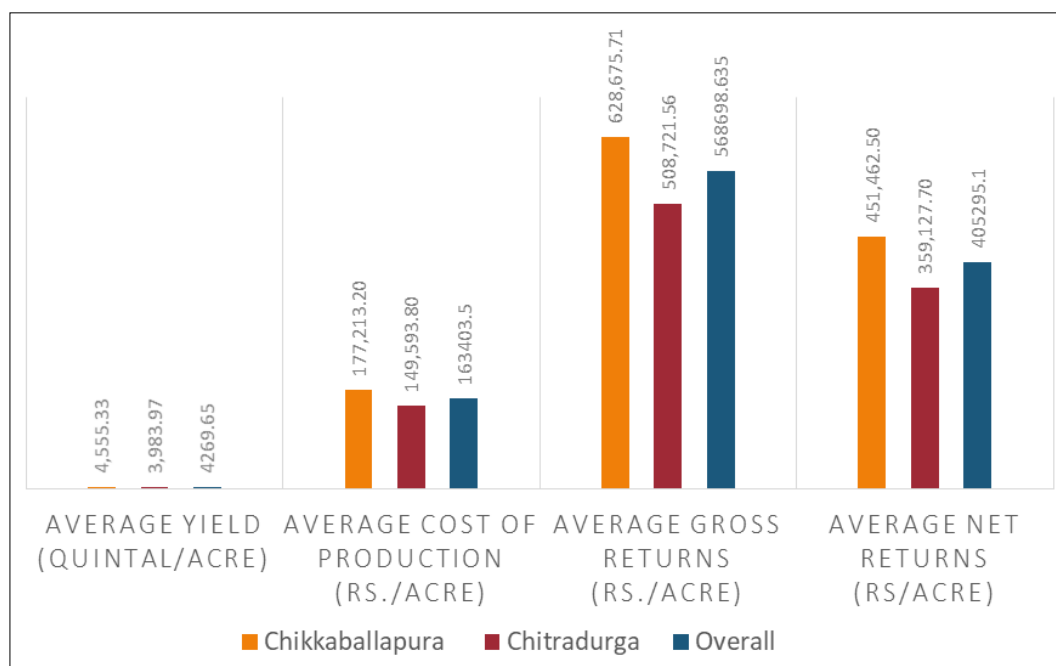


Fig 3: Average cost and return analysis of beneficiary pomegranate growers of NHM

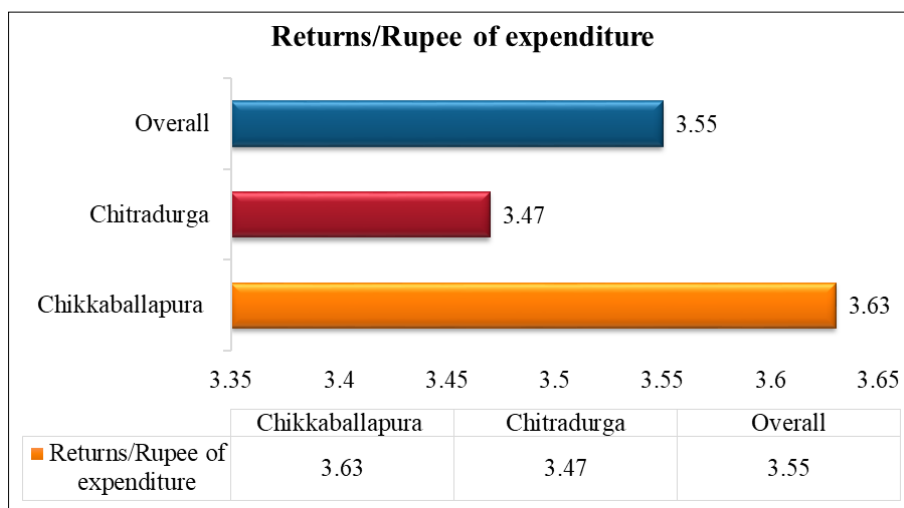


Fig 4: Returns/Rupee of expenditure analysis of beneficiary pomegranate growers of NHM

The economic performance of beneficiaries in Chikkaballapura district was generally better than in Chitradurga, especially in terms of yield, gross returns, and net returns. Both districts, however, showed profitable returns on expenditure, indicating that the NHM scheme is effective in increasing horticultural profitability with respect to pomegranate cultivation

3.4 Average cost and return analysis of non-beneficiary pomegranate growers of NHM in Chikkaballapura and Chitradurga

The table 4 presents the economic performance of non-beneficiaries from Chikkaballapura and Chitradurga districts, covering key variables like average yield, cost of production, gross returns, net returns, and returns per rupee of expenditure.

3.4.1 Average yield (Quintal per Acre)

In Chikkaballapura district, the average yield was 4,470.68 quintals per acre, which was higher than that of Chitradurga. This suggests that non-beneficiaries in Chikkaballapura district have better productivity levels per acre, potentially due to more favorable land conditions, better irrigation systems, or access to improved farming practices. While Chitradurga, the average yield was 3,700.28 quintals per acre, which was lower than in Chikkaballapura. The reasons could be linked to factors such as poorer soil quality, less advanced technology, or other resource constraints that limit productivity. Finally, the overall average yield for non-beneficiaries across both districts is 4,085.48 quintals per acre, indicating a moderate level of productivity across the regions. The yield in Chikkaballapura was notably higher compared to Chitradurga.

3.4.2 Average cost of production (Rupees per Acre)

In Chikkaballapura, the average cost of production was ₹2,24,529.70 per acre, which was significantly higher than in Chitradurga. This higher cost could be due to greater reliance on expensive inputs, labour, and potentially more advanced farming technologies used in Chikkaballapura district. Where as in Chitradurga, the average cost of production is ₹1,61,450.80 per acre, which was considerably lower than Chikkaballapura. This suggested that farming in

Chitradurga may be less resource-intensive, but it also reflects the relatively lower yield, which could indicate that cost-efficiency was not being fully realized. Totally the overall, the average cost of production across both districts was ₹1,92,990.25 per acre, falling between the costs observed in Chikkaballapura and Chitradurga. The higher costs in Chikkaballapura might be linked to more intensive farming practices.

3.4.3 Average gross returns (Rupees per Acre)

In Chikkaballapura, the average gross return is ₹6,43,811.11 per acre, which was higher than in Chitradurga. This indicated that non-beneficiaries in Chikkaballapura districts were able to generate more revenue per acre, likely due to better yields, higher market prices, or both. Whereas, in Chitradurga, the average gross return was ₹4,18,648.89 per acre, which was lower than in Chikkaballapura. The lower yield in Chitradurga district, combined with possibly lower prices for agricultural products, results in reduced revenue compared to Chikkaballapura district. The overall average gross return is ₹5,31,230.00 per acre, reflecting a mid-range figure between the returns in Chikkaballapura and Chitradurga. The higher gross returns in Chikkaballapura showed that non-beneficiaries in this district were able to achieve better revenue from their farming activities.

3.4.4 Average net returns (Rupees per Acre)

In Chikkaballapura, the average net return was ₹2,09,640.70 per acre, which was higher than Chitradurga district. This higher net income suggested that, despite higher production costs, non-beneficiaries in Chikkaballapura were able to generate greater profits due to better yields and higher gross returns. While in Chitradurga, the average net return is ₹1,28,599.00 per acre, which was lower than Chikkaballapura. This was largely due to lower gross returns and the moderate cost of production, which results in smaller profits for non-beneficiaries in this district. The overall average net return was ₹1,69,119.85 per acre, indicating a moderate level of profitability for non-beneficiaries across both districts. The non-beneficiaries in Chikkaballapura exhibit significantly higher net returns than those in Chitradurga, highlighting the regional disparity in farming outcomes.

3.4.5 Returns per rupee of expenditure

In Chikkaballapura, the returns per rupee of expenditure was 2.89, which was higher compared to Chitradurga. This means that for every rupee spent on production, non-beneficiaries in Chikkaballapura earn ₹2.89 in returns, reflecting relatively good cost efficiency and profitability. While in Chitradurga, the returns per rupee of expenditure was 2.56, which was slightly lower than in Chikkaballapura districts. This indicated that non-beneficiaries in

Chitradurga were not generating as much return per unit of expenditure, likely due to lower yields and gross returns. The overall return per rupee of expenditure is 2.73, suggesting that non-beneficiaries across both the districts were generating a reasonable return on their expenditures. However, Chikkaballapura district beneficiaries appear to be more efficient in generating returns relative to their production costs.

Table 4: Average cost and return analysis of non-beneficiary pomegranate growers of NHM (n=60)

Particulars	Chikkaballapura Non-Beneficiaries (n ₁ =30)	Chitradurga Non-Beneficiaries (n ₂ =30)	Overall Non-Beneficiaries (n=60)
Average Yield (Quintal/acre)	4,470.68	3,700.28	4085.48
Average Cost of Production (Rs./acre)	2,24,529.70	1,61,450.80	192990.25
Average Gross returns (Rs./acre)	6,43,811.11	4,18,648.89	531230.00
Average Net returns (Rs/acre)	2,09,640.70	1,28,599.00	169119.85
Returns/Rupee of expenditure	2.89	2.56	2.73

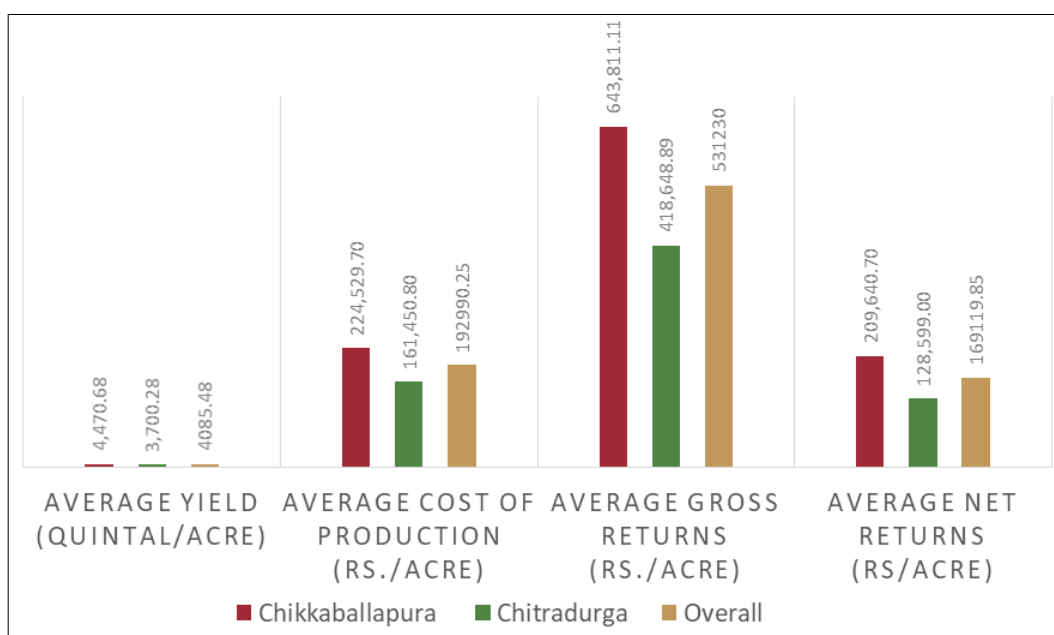


Fig 5: Average cost and return analysis of non-beneficiary pomegranate growers of NHM

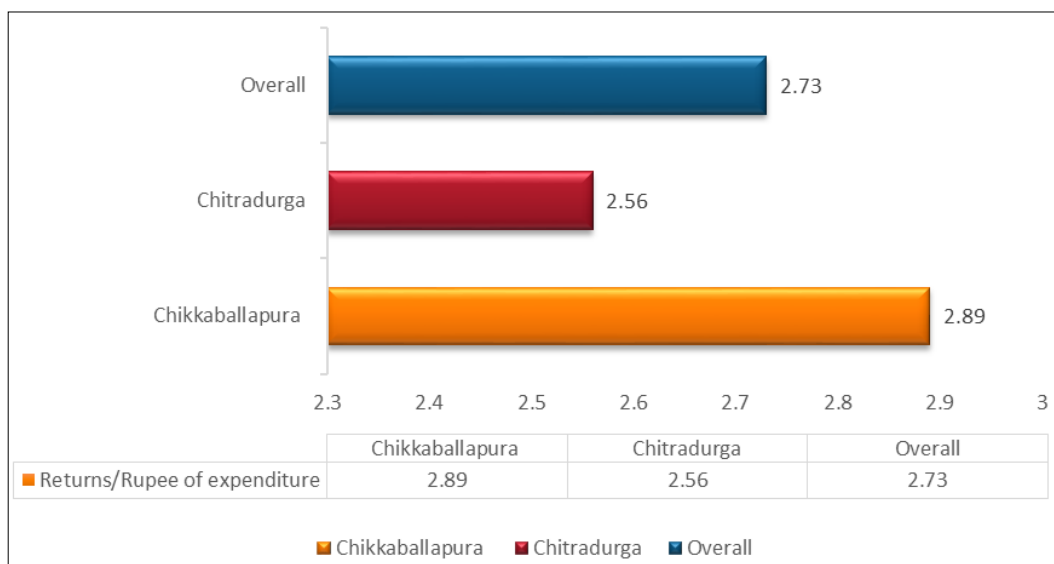


Fig 6: Returns/Rupee of expenditure analysis of non-beneficiary pomegranate growers of NHM

Impact of regional factors, the economic performance disparity between the two regions can be attributed to various factors, such as soil quality, farming practices, access to resources, and market conditions. Chikkaballapura farmers were achieving better results despite higher costs, likely due to higher productivity or better market prices for their produce. Profitability of non-Beneficiaries were still able to generate moderate levels of profitability, especially in Chikkaballapura, but their returns were generally lower compared to beneficiaries. This indicated that, while non-beneficiaries were performing reasonably well, the NHM scheme likely provides additional benefits that boost yields and returns, making beneficiaries more financially successful.

4. Conclusion

The present study was concluded to know the economic performance of pomegranate growers under National Horticulture Mission (NHM). The majority of beneficiaries were experiencing moderate economic success, but only a small percentage were reaching high-performance thresholds, suggesting that additional support and interventions may be necessary for those in the low-performance category. However, economic performance of non-beneficiaries in both Chikkaballapura and Chitradurga districts shows a moderate overall income distribution, with many individuals in the medium-performance category. Further, the relatively high proportion of low-income non-beneficiaries, especially in Chitradurga district, underscores the challenges faced by these growers. Extending the NHM schemes support to non-beneficiaries could help improve their horticultural productivity and economic outcomes, benefiting them in a similar way to NHM beneficiaries.

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