AN ECONOMIC VIABILITY AND DEMOGRAPHIC ANALYSIS OF KINNOW GROWERS IN HANUMANGARH, RAJASTHAN

Ashish Kumar* and Ramchandra**

godaraashish02@gmail.com

- P G Scholar, Department of Agricultural Economics, SHUATS, , Prayagraj, Uttar Pradesh

** Professor, Department of Agricultural Economics, SHUATS, , Prayagraj, Uttar Pradesh

ABSTRACT: This research paper explores the demographics, agricultural practices, and economic dynamics of Kinnow cultivation among farmers in the Hanumangarh District of Rajasthan. The study comprises a demographic analysis of 100 Kinnow growers, revealing a varied age distribution that includes both younger (<=25 years) and older (>55 years) farmers, encompassing 16% and 19% of the surveyed population respectively. The majority of the farmers are aged between 36-45 years, constituting 26% of the sample. The educational background of these farmers shows considerable diversity, ranging from illiteracy to graduate levels, with a significant number having received secondary education. Landholding sizes among the farmers also vary, with semi-medium and medium-sized farms being the most common, indicating different scales of operations and strategies. The economic analysis details the financial inputs and returns of Kinnow farming over a four-year period. Initial investments are substantial, primarily for land and layout preparation, including significant one-time expenses such as tube well installation and pit digging. The study records a total annual expenditure peaking in the first year, with subsequent years showing more stabilized costs. The total cost per acre for Kinnow cultivation is reported at 52,533 INR, with plant protection and pruning being the most significant ongoing expenses. Despite the high initial costs, Kinnow cultivation proves economically viable, offering a consistent yield of 95 quintals per acre and a gross return of 115,425 INR per hectare. The findings suggest that Kinnow cultivation, while financially demanding initially, holds substantial economic promise for farmers who can effectively manage upfront costs and optimize their farming operations, potentially enhancing their profitability and sustainability in the long term.

Key Words: Demography, economic, kinnow, growers, farmers, land holdings

The cultivation of Kinnow, a hybrid mandarin fruit, has become an integral aspect of the agricultural landscape in Hanumangarh District, Rajasthan. This study explores the economic viability and demographic analysis of Kinnow growers, providing insights into the intersection of agricultural practices and socio-economic factors that define the region's Kinnow production.

The demographic profile of Kinnow growers in Hanumangarh presents a diversified age structure, where younger and older farmers coexist, thus incorporating a mix of traditional and modern farming techniques. Approximately 16% of the growers are under 25 years of age, showcasing the involvement of youth in agriculture, while 19% are over 55, indicating experienced farmers who provide traditional knowledge and stability (Sharma and Singh, 2012). The majority falls within the 36-45 year age bracket, highlighting a matured workforce dominating the farming activities (Mehta and Sharma, 2015). This diverse age distribution could be crucial for adaptive practices and innovation in Kinnow cultivation.

Education among Kinnow farmers varies significantly, which impacts their farming practices and ability to adopt new technologies. About 14% of the farmers are illiterate, potentially hindering their capacity to engage with advanced agricultural techniques, while a similar proportion holds graduate degrees, possibly facilitating a better understanding of modern farming methods (Kumar and Deep, 2018).

Landholding patterns also play a vital role in the economic outcomes of Kinnow cultivation. The study shows a range from marginal to large farms, with the largest segments being semi-medium and medium-sized farms. These sizes influence the cultivation strategies and operational scales, impacting the overall productivity and profitability (Patel et al., 2017).

The economic analysis of Kinnow cultivation reveals a significant initial investment in infrastructure, particularly in land preparation and irrigation systems like tube wells and drip irrigation (Singh and Gupta, 2019). The initial year records the highest expenditure, primarily due to these one-time investments. However, subsequent years see a stabilization in costs, which aligns with the depreciation of initial infrastructural investments (Raj and Lal, 2020).

Despite the high upfront costs, the returns from Kinnow cultivation are promising. The productivity per acre stands at 95 quintals, with a gross return of 115,425 INR per hectare, indicating substantial returns that can offset the initial high costs over time (Goyal and Singh, 2016). This return rate underscores

the economic viability of Kinnow farming, provided that the growers manage the initial expenses efficiently and optimize their farm management practices.

The marketing of Kinnow plays a critical role in its economic viability. Hanumangarh's proximity to major markets and the existence of established supply chains facilitate the marketing of Kinnow, although challenges such as fluctuating market prices and the need for better marketing strategies are evident *(Malik and Chaudhary, 2014).* Effective marketing strategies could enhance profit margins and provide more stable income streams for farmers (Verma and Singh, 2018).

The sustainability of Kinnow farming hinges on several factors including water availability, pest management, and the impact of climate change. Studies by *Dhaliwal and Singh (2017)* highlight the need for sustainable water management practices to ensure the long-term viability of Kinnow cultivation in arid zones like Rajasthan.

Furthermore, challenges such as pest infestations and diseases can diminish yield and affect the quality of the produce, thereby impacting profitability (Kaur and Arora, 2019). Innovative approaches to pest management and disease control are essential to maintain the health of the crops and ensure consistent yield *(Bhattacharya and Sharma, 2021).*

RESEARCH METHODOLOGY

A multi-stage sampling procedure was adopted for the selection of samples:

a. First stage - Selection of District
b. Second stage - Selection of Block
c. Third stage - Selection of Villages
d. Fourth stage - Selection of Respondents
e. Fifth stage - Selection of Market & Marketing Functionaries

Selection of District: Rajasthan has 50 districts and 10 divisions. For this study, the Hanumangarh district was selected purposively based on its high production of Kinnow.

Selection of Block: There are 7 development blocks in Hanumangarh district. The Sangria block was selected purposively due to its maximum production of Kinnow.

Selection of Villages: A complete list of villages was obtained from the Block Development Office. Villages were ranked based on Kinnow production area. Subsequently, 5% of these villages were randomly selected for the study.

Selection of Respondents: With the assistance of the Gram Pradhan, a list of all farmers was prepared. From this list, 10% of the respondents, specifically Kinnow growers, were selected based on their experience and productivity.

Selection of Markets and Market Functionaries: The list of market functionaries was prepared with the help of the district mandi office, and 10% of these functionaries were selected randomly.

Source of Information: Primary and secondary sources of information were utilized. Primary data was collected through direct communication with respondents using structured questionnaires, interviews, and personal interactions.

Method of Primary Data Collection: Primary data was collected from consumers, merchants, and various agencies using a survey method. A structured questionnaire was prepared for this purpose.

Method of Secondary Data Collection: Secondary data was gathered from various journals, articles, research papers, and organizational websites that provided relevant information.

RESEARCH METHODOLOY

Table 1: Demographic Profile of Kinnow Grower in Hanumangarh District of Rajasthan N=100

Age Group	Farmers	(%)	Education	Farmers	(%)	Farm Size	Farmers	(%)
<=25 years	16	16	Illiterate	14	14	Marginal	16	16
26-35 years	24	24	Primary	18	18	Small	19	19
36-45 years	26	26	Secondary	29	29	Semi Medium	23	23
46-55 years	15	15	Senior Secondary	26	26	Medium	24	24
>55 years	19	19	Graduate	13	13	Large	18	18
Total	**100**	**100**	**Total**	**100**	**100**	**Total**	**100**	**100**

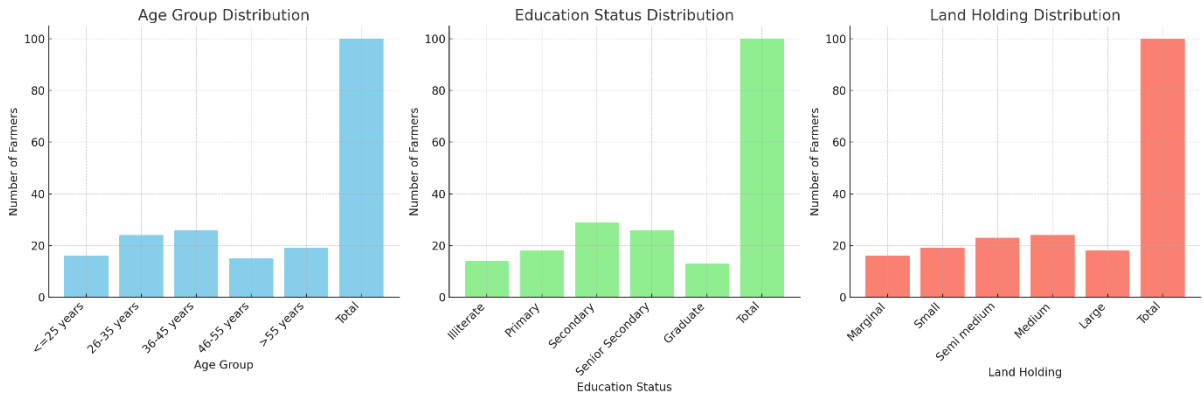

Fig. 1: Demographic Profile of Kinnow Grower

Table- 2: Annual Expenditure on Kinnow Cultivation in Hanumangarh District of Rajasthan N=100

S.No.	Particulars	Year I	Year II	Year III	Year IV
1	Land and layout preparation	7243	5867.65	6012.63	6027.42
2	Pit digging and filling	3882.69	0	3200	3200
3	Planting material and cost	5182.92	0	0	0
4	Cost of irrigation	1953.02	1761.01	1875.08	1789.67
5	Tube well	90671.43	0	0	0
6	Drip Installation	110651.21	1200	1200	1200
7	Electricity/Diesel cost	5282.58	5431.21	5316.23	5263.54
8	Permanent fencing	23567.24	0	0	0
9	Cost of hired tools and implements	7654	6211.37	15421.12	13215.41
10	Pruning	0	1965.25	2564.54	5214.84
11	Gap filling	500	1200	1500	1500
12	Miscellaneous	5000	7000	8400	9500
Total		261588.09	30636.49	45489.6	46910.88

Table- 3: Cultural Operations and Returns in Kinnow Cultivation N=100

S.No.	Items	INR/Acre
1	Cultural operation	5825
2	FYM	4834
3	Urea	1250
4	NPK	2272
5	DAP	3842
6	Irrigation	1451
7	Plant protection	17521
8	Pruning	6863
9	Staking	3325
10	Harvesting	1850
11	Another cost	3500
Total Cost	**Total Cost**	52533
Productivity (Quintal/Acre)	**95**	
Gross Return (INR/Ha)	**115425**	

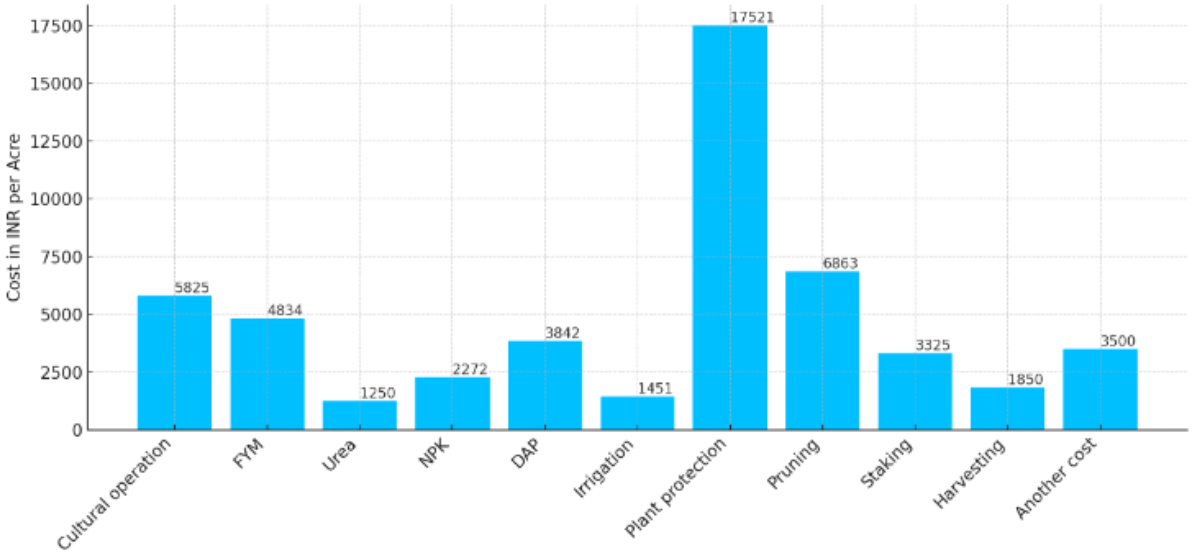

Fig. 1: Cultural Operations and Returns in Kinnow

RESULTS AND DISCUSSION

The demographic profile of Kinnow growers in Hanumangarh District of Rajasthan shows a diverse age distribution among the 100 surveyed farmers. The youngest group (<=25 years) and the oldest group (>55 years) represent 16% and 19% of the population, respectively. The largest group falls within the 36-45 years age range, making up 26% of the population. Education levels vary significantly, with 14% of the farmers being illiterate and a similar percentage holding a graduate degree. The majority have received secondary education (29%). Landholdings are also varied; with the largest segments being semi-medium (23%) and medium (24%) sized farms. The annual expenditure on Kinnow cultivation over four years highlights significant investments in infrastructure and maintenance. Initially, major expenses were made on land and layout preparation and tube well installation, with costs peaking at over 90,000 INR in the first year. Other significant expenditures include drip installation and permanent fencing, although costs for items like pit digging, filling, and planting material drop to zero after the first year, indicating one-time expenses. Annual costs fluctuate with the highest expenditures in the first year and more stable, lower costs in subsequent years.

Cultural operations and returns on Kinnow cultivation show that the total cost per acre is 52,533 INR, with plant protection and pruning being the costliest operations. The productivity is estimated at 95 quintals per acre, resulting in a gross return of 115,425 INR per hectare. This suggests that while Kinnow cultivation involves substantial initial and ongoing costs, the financial returns can be considerable, offering a viable agricultural venture for farmers in the region.

Conclusion

The study of Kinnow growers in Hanumangarh District of Rajasthan offers a detailed perspective on the demographic distribution, agricultural practices, and economic outcomes associated with Kinnow cultivation. Notably, the age distribution among farmers suggests a relatively balanced representation across different age groups, ensuring a dynamic mix of experience and potentially innovative approaches to farming. The educational profiles of these growers indicate a diverse range of knowledge levels, which could influence farming practices and adoption of new technologies.

Landholding patterns in the district reveal a broad spectrum of farm sizes, from marginal to large, affecting cultivation strategies and operational scales. The financial analysis of Kinnow cultivation underscores a substantial initial investment primarily driven by land preparation and installation of irrigation systems. These upfront costs are crucial for establishing a sustainable operation that, over time, tends to stabilize in terms of annual expenditures.

From a financial standpoint, while the initial years require heavy investments, the return on investment appears promising with a consistent output of 95 quintals per acre, leading to significant gross returns. This profitability highlights Kinnow cultivation as a potentially lucrative agricultural activity in the region, provided that farmers manage initial costs and optimize their cultivation practices.

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