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A comparative study of socio-economic profile of CBNF and Non-CBNF Okra & tomato growers in Middle Gujarat Region

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Abstract

This study sheds light on the socio-economic characteristics of CBNF (Cow-based Natural Farming) *vs.* non-CBNF okra and tomato cultivators. This study was confined to the middle Gujarat region only. A total of 160 respondents were selected and interviewed from Anand and Vadodara districts, comprising 80 CBNF and 80 non-CBNF farmers. Of these, 40 were cultivating tomato and 40 were growing okra for each category. Tabular analysis was employed to analyze the results in the research site. The average age of farmers cultivating okra and tomato under CBNF was found to be less compared to non-CBNF farmers. While the majority of farmers in both categories were educated, the number of illiterate farmers was slightly higher among non-CBNF farmers than CBNF. The respondents had relatively fewer years of experience when it comes to natural farming than with conventional farming, possibly because of its novelty. Most of okra and tomato growers were from the general category, followed by others under both CBNF and non-CBNF systems. The societal engagement of CBNF adopters was greater, particularly with multi-organizations and ATMA (Agricultural Technology Management Agency), while non-CBNF adopters were more actively associated with milk-cooperative societies. Additionally, it was found that farmers growing okra and tomato under CBNF had smaller family size as compared to non-CBNF farmers cultivating the same crop. Moreover, the families of CBNF farmers had a higher number of earners, a greater earner-to-non-earner ratio and a relatively higher share of earners to total family members compared to non-CBNF. The cultivated land area under CBNF was comparatively smaller than that of non-CBNF. In both categories of respondents, majorly depend on tube wells for irrigation purposes, followed by wells in the research location.

Keywords: CBNF, non-CBNF, Okra & Tomato farming, socio-economic characteristics

1. Introduction

Agriculture and its associated sectors provide the largest means of support in many developing economies including India. India is an agrarian economy as 65 *per cent* of the country's population lives in rural areas and 47 *per cent* of the population is dependent on agriculture for their livelihood [1]. The economy is expected to increase by 7 *per cent* in the fiscal year 2023, after growing 8.7 *per cent* in the previous financial year 2022 (pib.gov.in). India's population has been rapidly growing over the years, as of May 2024, India's current population is 1.44 billion, making it the most populous country, surpassing China (statisticstimes.com). Keeping in view the population of our country, agriculture practices of the present day should be able to provide food and nutritional security to the nation while addressing issues related to sustainable agriculture, the preservation of natural resources and climate change. India introduced the Green Revolution program, which helped to achieve higher food production, *i.e.* 315.7 million MT in 2022 compared to 50 MT in the 1950 (pib.gov.in). The Green Revolution in India considerably increased both the efficiency and yield of cereal crops, leading to self-reliance in grain supplies. India's Green Revolution has come at an environmental cost that may be irreversible. Economic development has become progressively dependent on finite resources such as synthetic fertilizers, insecticides, petroleum and natural gas. India now pursues a fast-track development model similar to that of many Western nations. However, it remains uncertain whether this growth strategy is environmentally sustainable in India's context, as rapid economic expansion often contributes to environmental degradation [2]. A transformational shift toward 'holistic' approaches, such as agro-ecology, agro-forestry, climate-smart agriculture and conservation agriculture, is crucial. Natural farming, or Prakritik Krishi, is a low-input, climate-resilient traditional farming system that entirely rejects synthetic chemical agro-inputs. It follows agro-ecological practices, prioritizing the use of bio-inputs produced on the farm rather than purchasing outside inputs [3].

Andhra Pradesh is the leading state with an area of 290000 ha *i.e.* 30.45 *per cent* of the total area in India followed by Gujarat, Madhya Pradesh, Uttar Pradesh and Kerala, constituting 186000 (19.53%), 111000 (11.65%), 97460 (10.23%) and 82000 (8.61%), respectively, during the year 2022-23 (naturalfarming.dac.gov.in). India is the world's second-largest producer of fruits and vegetables after China (pib.gov.in). India produced 207.20 thousand MT of vegetables, growing them over an area of 11.23 thousand hectares, during the year 2023-24, as per the National Horticulture Database. Okra secured 557 thousand hectares

i.e. 4.96 *per cent* of the total cropped area under vegetables, producing 7305.41 thousand MT and *viz.* 3.53 *per cent* of the overall vegetable production during 2023-24. Meanwhile, tomatoes occupied a larger area of 853.99 thousand hectares *i.e.* 7.60 *per cent* of the entire cultivated area dedicated to vegetables and yielding 21323.22 thousand MT *viz.* 10.29 *per cent* of the overall vegetable production for the same year 2023-24. In terms of okra production, Gujarat occupied first position by producing 1133.08 thousand tonnes *i.e.* 15.51 per cent of India's total production (nhb.gov.in). Anand and Vadodara ranked first and third, with with 4725 hectares (17.51%) and 4674 hectares (17.32%), respectively (doh.gujarat.gov.in). In terms of tomato cultivation, Gujarat secured the fourth position with 1809.69 thousand tonnes *viz.* 8.49 per cent of India's total production (nhb.gov.in). Anand secured first rank with 231852 metric tonnes (33.41%) while Vadodara secured fourth position with 68073 metric tonnes (9.81%) (doh.gujarat.gov.in). The rationale for addressing the potential gap between Community-Based Natural Farming (CBNF) and non-CBNF practices lies in its ability to tackle key challenges and harness emerging opportunities within the agricultural sector. Natural farming, being a relatively new concept in Gujarat, holds significant promise for enhancing sustainability, improving soil health, reducing dependency on chemical inputs, and increasing farm profitability. Therefore, this study has been undertaken to examine the socio-economic profiles of both CBNF and non-CBNF farmers engaged in the cultivation of okra and tomato.

2. Review of literature

Sakhiya [4] investigated socio-economic profile of farmers who had taken up CBNF and conventional farming for wheat and paddy crops in middle Gujarat. She observed that the respondent's average landholding under CBNF was about 3.15 hectares as against non-CBNF *i.e.* 3.34 hectares. Furthermore, majority of sampled farmers *i.e.* 98.33 *per cent* were literate, with the remaining 1.67 *per cent* being illiterate. In comparison, for conventional farming, 96.67 *per cent* were literate, while 3.33 *per cent* were illiterate. The average age of CBNF adopter farmers was 48.51 years, whereas for non-CBNF farmers, it was 52.10 years. Results revealed that the majority of CBNF respondents implemented farming in conjunction with animal husbandry (85%) as their primary occupation.

Balla and Goswami (2022) [5] conducted their research on understanding the reasons to adopt natural farming for the rice crop in Andhra Pradesh. In natural farming, a majority *viz*. 61 *per cent* had attained secondary education, followed by higher secondary (16%), primary (15.2%) and higher education (7.8%) and with no illiterate individuals. On the other hand, among conventional farmers, primary education was common *viz*. 42.2 *per cent*, followed by those with no formal education (31.2%). Disparities in farm size were also evident in the study area, with an average farm size of 0.72 hectares in NF and 0.91 hectares in CF. Both groups were predominantly involved in agriculture as their main occupation, but conventional farmers were more experienced in rice farming, possibly due to the novelty of NF as an agricultural venture.

Thorat and Pawar (2022) [6] analyzed the rivalry between NF and CF in Pune, in which they considered 435 farmers as the sample. Results showed that majority of farmers practicing NF *viz*. 53.56 *per cent* had attained secondary education, followed by primary (22.98%), graduation (17.24%) and post- graduation (6.89%). A larger proportion of farmers *viz*. 33.10 *per cent* reported that they had less than 5 years of experience in natural farming, followed by 29.19 *per cent* who had 5-10 years of experience, 22.19 *per cent* who had 10-20 years of experience and 15.40 *per cent* who had over 20 years of experience.

Laishram (2024) [7] studied the socio-economic determinants of farmers who followed NF in the sub-tropical area of Himachal Pradesh. He found that the average family size was 5.22 in the study area. The average literacy rate was 87.13 *per cent*, while it varied from 87.13 to 89.10 *per cent* among various farm categories. Additionally, 78.02 *per cent* of the studied households were involved in agricultural activities, while 13.48 *per cent* were engaged in services and 8.50 *per cent* were involved in business. The overall average landholding in the study region was observed to be 1.82 hectares.

3. Methodology

3.1 Selection of Respondents

For the research, a multi-stage sampling technique was employed. Anand and Vadodara districts from the middle Gujarat region were intentionally selected, as the number of farmers practicing CBNF in okra and tomato cultivation was relatively high in these localities. From these two districts, four talukas were chosen and from each taluka, two villages were purposively selected based on the concentration of okra and tomato growers following the CBNF approach. From each of these villages, five farmers were selected, resulting in a total of 40 CBNF farmers and 40 non-CBNF farmers for both okra and tomato cultivation. Thus, a total of 160 respondents were selected, comprising 80 each engaged in CBNF and 80 in non-CBNF for the study.

3.2 Analytical tools & techniques

To evaluate the socio-economic characteristics of CBNF and non-CBNF farmers engaged in okra and tomato cultivation, tabular analysis was conducted. Relevant data for the year 2023-24 was systematically collected, organized, and analyzed. Various analytical tools, including averages, percentages, ratios, and basic comparative methods, were applied wherever appropriate.

4. Results and Discussion

Table 1: Age-wise categorization of okra & tomato growers under CBNF and non-CBNF system

Sr. No.	Particulars	CBNF	Non-CBNF	Overall
1	Young (up to 35 years)	23 (28.75)	13 (16.25)	36 (22.50)
2	Adult (36-50 years)	37 (46.25)	32 (40.00)	69 (43.12)
3	Old (above 50 years)	20 (25.00)	35 (43.75)	55 (34.37)
Total		80 (100.00)	80 (100.00)	160 (100.00)
Average age		44.1	49.2	46.65

Source: Field Survey

Note: Figures in parentheses indicate *per cent* to total

The distribution of respondents across these categories is depicted in Table 1. It was observed that the average age of farmers adopting CBNF was 44.1 years. Out of them, majority (46.25%) i.e. 37 farmers practicing CBNF were in the adult age category (36-50 years), followed by 23 and 20

CBNF adopter farmers representing 28.75 per cent and 25.00 per cent were in the young (up to 35 years) an old age (>50) category, respectively. Under non-CBNF, the mean age of farmers was 49.2 years. Out of which, only 13 non-CBNF farmers *i.e.* 16.25 *per cent* were in the young age group, while 32 and 35 non-CBNF adopters *viz.* 40.00 and 43.75 *per cent* were in the adult (36-50 years) and old age (>50) category, respectively. On average, the mean age of farmers engaged in both CBNF and non-CBNF was 46.65 years. Among the 160 respondents, 43.12 *per cent* were in the adult age category, followed by 34.37 *per cent* and 22.50 *per cent* belonged to the old and young age categories. In short, CBNF adopters primarily belonged to young and adult age categories as compared to non-CBNF farmers. Similar outcomes were reported by Sakhiya (2021) [4].

Table 2: Educational Status of CBNF and non-CBNF adopters

Sr. No.	Particulars	CBNF	Non-CBNF	Overall
1	Illiterate	03 (03.75)	09 (11.25)	12 (07.50)
2	Primary (upto VIII)	12 (15.00)	25 (31.25)	37 (23.12)
3	Secondary (IX-X)	18 (22.50)	16 (20.00)	34 (21.25)
4	Higher Secondary	28 (35.00)	17 (21.25)	45 (28.12)
5	Graduation & above	19 (23.75)	13 (16.25)	32 (20.00)
Total		80 (100.00)	80 (100.00)	160 (100.00)
Average years of education		11.01	9.33	10.17

Source: Field Survey
Note: Figures in parentheses indicate *per cent* to total

From Table 2 it is evident that among 80 respondents practicing CBNF, a significant proportion *i.e.* 35.00 *per cent*, had completed higher secondary level education, which accounted for a total of 28 CBNF adopters. Consequently, 19 CBNF adopters *i.e.* 23.75 *per cent* had attained education at the graduation & above. Moreover, 18 respondents *viz.* 22.50 *per cent* had completed a secondary level of education, followed by 12 CBNF adopters who had received education up to the primary level *i.e.* 15.00 *per cent*. In non-CBNF, it was found that under conventional farming, majority of respondents *i.e.* 31.25 *per cent*, comprising of a total of 25 non-CBNF adopters, had completed education up to the primary level, followed by 17 (21.25%) respondents who had attained education up to the higher secondary level. The results revealed that the average years of education were 11.01 years in case of CBNF and 9.33 years in case of non-CBNF. In summary, a sizeable portion *i.e.* 28.12 *per cent*, representing 45 respondents, had completed education up to the higher secondary level, followed by 37 (23.12%), 34 (21.25%) and 32 (20.00%) respondents who had attained education at primary, secondary and graduation & above level, respectively. Additionally, 12 respondents *viz.* 07.50 *per cent* were identified as illiterate. Similar results were found by Balla and Goswami (2022) [5].

Table 3: Experience of respondents under CBNF and conventional farming

Sr. No.	Particulars	CBNF	Non-CBNF	Overall
1	Upto 3 years	60 (75.00)	10 (12.50)	70 (43.75)
2	4-6 years	20 (25.00)	37 (46.25)	57 (35.62)
3	7 years & above	00 (00.00)	33 (41.25)	33 (20.62)
Total		80 (100.00)	80 (100.00)	160 (100.00)
Average years of experience		3.05	10.30	6.68

Source: Field Survey
Note: Figures in parentheses indicate *per cent* to total

The farmers engaged in CBNF had an average 3.05 years of experience in natural farming, as opposed to this, the average years of experience in case of non-CBNF stands at 10.30 years. It was noticed that a significant portion of farmers *i.e.* 75.00 *per cent*, comprising a total of 60 respondents, possessed experience in CBNF upto 3 years, followed by 20 respondents *viz.* 25.00 *per cent* having experience ranging between 4 to 6 years. Besides, none of the respondents had experience of 7 years or more of experience. In contrast, among non-CBNF farmers, majority *i.e.* 37, representing 46.25 *per cent* had experience between 4 to 6 years, followed by 33 (41.25%) and 10 (12.50%) having experience of above 7 years and up to 3 years, respectively.

Overall, it revealed that a major portion of respondents *viz.* 70 (43.75%) had up to 3 years of experience, followed by 57 (35.62%) and 33 (20.62%) having an experience between 4 to 6 years and 7 years or above, respectively. Since CBNF is a relatively new concept in Gujarat, most farmers do not have extensive experience with it. However, adoption rates are anticipated to increase over time as government efforts continue. This transition requires patience due to the gradual shift in practices and mindsets. Aligned findings were documented by Balla & Goswami [5] and Thorat & Pawar (2022) [6].

Table 4: Caste-wise categorization of farmers engaged under CBNF and non-CBNF

Sr. No.	Caste	CBNF	Non-CBNF	Overall
1	General	44 (55.00)	63 (78.75)	107 (66.88)
2	Others	36 (45.00)	17 (21.25)	53 (33.12)
	Total	80 (100.00)	80 (100.00)	160 (100.00)

Source: Field Survey
Note: Figures in parentheses indicate *per cent* to total

The caste wise categorization of farmers practicing CBNF and non-CBNF has been displayed in Table 4. In CBNF, majority of adopters *viz.* 44, comprising 55 *per cent* belonged to the general category as opposed to these 63 respondents *i.e* 78.75 *per cent* were of the general category in case of non-CBNF. It was followed by 36 (45%) and 17 (21.25%) belonging to the others category in the case of CBNF and non-CBNF, respectively. On average, 107 respondents *viz.* 66.88 *per cent* were from the general category while 53 *i.e.* 33.12 *per cent* of them, belonged to others category.

Table 5: Social participation of respondents under CBNF and non-CBNF with different organizations

Sr. No.	Particulars	CBNF	Non-CBNF	Overall
1	Village Panchayat	00 (00.00)	03 (03.75)	03 (01.87)
2	Milk co-operative society	13 (16.25)	30 (37.50)	43 (26.87)
3	ATMA (FIGs)	00 (00.00)	05 (06.25)	05 (03.12)
4	Multi-organizations	67 (83.75)	25 (31.25)	92 (57.50)
5	Not associated	00 (00.00)	17 (21.25)	06 (10.62)
	Total	80 (100.00)	80 (100.00)	160 (100.00)

Source: Field Survey
Note: Figures in parentheses indicate the *per cent* to total

It was found that in case of CBNF, the majority of farmers *i.e.* 67 representing 83.75 *per cent* were involved with

multi-organizations like milk cooperative societies, ATMA (FIGs), *etc.* Moreover, 13 respondents *viz.* 16.25 *per cent* were associated with milk cooperative societies. In non-CBNF, the majority of respondents *i.e.* 30, constituting 37.50 *per cent*, were involved with milk cooperative societies, followed by 25 (3%) with multi- organizations, 5 (06.25%) with ATMA (FIGs) and 3 (06.25%) with the village panchayat. Moreover, it was noticed that 17 respondents *i.e.* 21.25 *per cent* were not associated with any kind of organizations.

In general, a remarkable portion of farmers *i.e.* 57.50 *per cent* were associated with multi-organizations, followed by 26.87 *per cent* engaged in milk-cooperative societies. This trend highlights the importance of organizational involvement in promoting awareness and adoption of innovative farming practices, including natural farming.

Table 6: Family dynamics of farmers adopting CBNF and non-CBNF

Sr. No.	Particulars	CBNF	Non-CBNF	Overall
1.	Male	02.10 (40.15)	02.30 (40.99)	02.20 (40.59)
2.	Female	01.93 (36.90)	01.96 (34.93)	01.94 (35.79)
3.	Children (upto 14 years)	01.20 (22.94)	01.35 (24.06)	01.27 (23.43)
Average Family Size		05.23 (100.00)	05.61 (100.00)	05.42 (100.00)

Source: Field Survey
Note: Figures in parentheses indicate the *per cent* to total

The statistics from the above table revealed that under CBNF, average family size of practitioners was 5.23, with 40.15 *per cent* of males and 36.90 *per cent* of females, along with 22.94 *per cent* of children. Alternatively, average family size of the household of non-CBNF respondents was 5.61, including 40.99 *per cent* of males and 34.94 *per cent* of females and 24.06 *per cent* of children. Overall, average family size across both CBNF and non-CBNF households stood at 05.42, in which 40.59 *per cent* were males, followed by 35.79 *per cent* of females and 23.43 *per cent* of children. In general, the data suggest that families of CBNF adopters were smaller on average compared to those of non-CBNF households. Similar results were found by Laishram (2024) [7].

Table 7 provides insights into the occupation-wise categorization. It was observed that among the farmers practicing CBNF and non-CBNF, a major portion of CBNF adopters *i.e.* 47.50 *per cent*, representing a total of 38 respondents, were engaged in farming and animal husbandry. It was followed by 27 respondents (33.75%) and 15 respondents (18.75%) involved in F+A+B and F+A+S, respectively. Conversely, a larger number of non-CBNF practitioners *viz*. 34 respondents (25.00%) were involved in farming and animal husbandry, followed by 18 (22.50%), 9 (11.25%), 8 (10.00%), 7 (05.00%) and 4 (05.00%) respondents engaged solely in farming, F+A+B, F+A+S, F+B and F+S, respectively. Since they don't own cows, some of these individuals don't adopt CBNF. Overall, the majority of CBNF and non-CBNF adopters *viz*. 72 respondents representing 45.00 per cent were performing F+A, followed by 36 (22.50%), 23 (14.37%), 18 (11.25%), 7 (04.37%) and 4 (02.50%) respondents were involved in F+A+B, F+A+S, F, F+B and F+S, respectively. The Results were in confirmation with Laishram [7].

Table 7: Occupation-wise categorization of the CBNF and non-CBNF (per HH)

Sr. No.	Particulars	CBNF	Non-CBNF	Overall
1.	Farming	00 (00.00)	18 (22.50)	18 (11.25)
2.	Farming + Animal Husbandry (F+A)	38 (47.50)	34 (42.50)	72 (45.00)
3.	Farming + Animal Husbandry + Business (F+A+B)	27 (33.75)	09 (11.25)	36 (22.50)
4.	Farming + Animal Husbandry + Service (F+A+S)	15 (18.75)	08 (10.00)	23 (14.37)
5.	Farming + Business (F+B)	00 (00.00)	07 (08.75)	07 (04.37)
6.	Farming + Service (F+S)	00 (00.00)	04 (05.00)	04 (02.50)
	Total	80 (100.00)	80 (100.00)	160 (100.00)

Source: Field Survey
Note: Figures in parentheses indicate the *per cent* to total

Table 8: Earning and non-earning members among the household practicing CBNF and non-CBNF

Sr. No.	Particulars	CBNF	Non- CBNF	Overall
1.	Total family Members	591	610	1201
2.	Individual contributing financially	232	215	451
3.	Non-earners of the family	359	395	750
4.	Ratio of earners to non-earners	0.64	0.54	0.59
5.	Proportion of earners to total Members (%)	39.25	35.24	37.24
6.	Average number of earners per household	02.90	02.69	02.79

Source: Field Survey
Note: Figures in parentheses indicate the *per cent* to total

Table 8 gives details on earning and non-earning dependent members among the households adopting CBNF and non-CBNF. It can be seen from the above table that total family members in case of CBNF was 591, compared to 610 in non-CBNF households. Among them, 232 individuals contributing financially and 359 were non-earners under CBNF. On the other hand, non-CBNF households had 215 earners and 395 non-earners. The average number of earners per household practicing CBNF was 2.90, whereas it was 2.69 in case of non-CBNF. The ratio of earners to non-earners *viz.* 0.64 in CBNF was higher than those of non-CBNF *i.e. 0*.54. Furthermore, households practicing CBNF had a high proportion of earners to total members *i.e.* 39.25 *per cent* as compared to 35.24 *per cent* of non-CBNF

households. In general, the ratio of earners to non-earners, proportion of earners to total members and average number of earners per household turned out to be 0.59, 37.24 *per cent* and 02.79, respectively. These findings indicate that CBNF adopters have a higher ratio of earners, likely due to increased agricultural productivity and diversified income sources.

Table 9: Operational size of land holding of CBNF and non-CBNF farmers (ha)

Sr. No.	Particulars	CBNF	Non-CBNF	Overall
1	Irrigated land	2.88 (100.00)	2.96 (100.00)	2.92 (100.00)
2	Un-irrigated land	00 (00.00)	00 (00.00)	00 (00.00)
3	Average land holding	2.88 (100.00)	2.96 (100.00)	2.92 (100.00)
4	Area under CBNF system	1.80 (62.50)	00 (00.00)	1.80 (61.64)
5	Area under okra farming	0.21 (11.66)	0.25 (08.44)	0.23 (12.77)
6	Area under tomato farming	0.24 (13.33)	0.33 (11.14)	0.29 (16.11)

Source: Field Survey
Note: Figures in parentheses indicate the *per cent* to total

It was evident from Table 9 that the average area of land holding under CBNF was 2.88 ha, while in non-CBNF it was slightly higher at 2.96 ha, with 100 *per cent* of land holding under irrigation in both categories. Out of total land holding under CBNF, 1.80 ha area *i.e.* 62.50 *per cent* of the average land holding, was dedicated to CBNF practices. The area specifically under okra and tomato farming was 0.21 ha *i.e.* 10.24 *per cent* of the CBNF system and 0.24 ha *viz.* 11.71 *per cent* of the CBNF system, respectively. In case of non-CBNF, the area dedicated to okra and tomato farming was 0.25 ha (07.94%) and 0.33 ha (10.48%), respectively. Similar findings were documented by Sakhiya [4] and Thorat & Pawar [6].

The figures from Table 10 revealed that among CBNF and non-CBNF practitioners, the majority of farmers *i.e.* 81.25 *per cent* and 78.75 *per cent* rely on tube wells as their primary source of irrigation, followed by 18.75 *per cent* 21.25 *per cent*, respectively, who use wells for irrigation. Overall, the majority of respondents *viz.* 80.00 *per cent* depended on tube wells for irrigation, followed by 20 *per cent* of respondents who had wells as a source of irrigation.

Table 10: Categorization of source of irrigation of CBNF and non-CBNF adopters

Sr. No.	Source of Irrigation	CBNF	Non-CBNF	Overall
1.	Tube well	65 (81.25)	63 (78.75)	128 (80.00)
2.	Well	15 (18.75)	17 (21.25)	32 (20.00)
	Total	80 (100.00)	80 (100.00)	160 (100.00)

Source: Field Survey
Note: Figures in parentheses indicate the *per cent* to total

5. Conclusion

The farmers adopting CBNF and non-CBNF from the study site indicated that CBNF was primarily adopted by farmers belonging to adult category and conventional farming was predominantly practiced by old age group, thus, the mean age of CBNF adopters was comparatively lower than that of non-CBNF adopters. Majority of farmers under both classes were educated, the number of illiterate farmers was slightly more under non-CBNF system, as compared to CBNF system, highlighting the vital necessity of undertaking measures to improve quality education. The respondents had relatively lower years of experience when it comes to natural farming than conventional farming, possibly because of its novelty. Most of the respondents were from the general category. The societal engagement of CBNF adopters was more, particularly with multi-organizations and ATMA, while non-CBNF adopters were more actively associated with milk-cooperative societies. It was noticed that farmers cultivating okra and tomato under CBNF had smaller family size as compared to non-CBNF farmers cultivating the same crops. Moreover, families of CBNF farmers had a higher number of earners, a greater earner-to-non-earner ratio and a relatively higher share of earners to total family members than those practicing non-CBNF. The involvement of CBNF adopters towards different organizations was more extensive than that of non-CBNF farmers, indicating a trend toward more inclusive participation to strengthen additional income generation. The cultivated land area under CBNF was comparatively smaller than that of non-CBNF. In both categories of respondents, the major source of irrigation was tube wells, followed by wells in the study area.

Disclaimer (Artificial Intelligence)

No generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text to image generators, have been used during writing or editing manuscripts.

Competing Interests

Authors have declared that no competing interests exist.

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