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### Perception of farmers towards natural farming in Chikkaballapur district of Karnataka

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#### Abstract

The research study was conducted during the year 2022-23 in Chikkaballapur district of Karnataka. The research study involved 60 ragi growers and 60 maize growers who were practicing natural farming. The primary objective was to study the perception of farmers towards natural farming, to document their constraints and gather suggestions related to natural farming practices. The findings revealed that nearly half (46.66%) of farmers had an average perception towards natural farming, followed by poor (29.17%) and better (24.17%) perception. Ragi growers had better perception towards natural farming than maize growers. The major constraints expressed by both ragi and maize growers were low yields in the initial years of natural farming, limitations in using natural farming solutions solely for prevention and the absence of certification and marketing support for natural farming produce. To address these issues, farmers suggested providing support or subsidies for the first three years to withstand yield losses, implementing all necessary plant protection measures in anticipation of pests and diseases and urging the government to establish certification and marketing infrastructure for natural farming produce.

**Keywords:** Natural farming, Ragi growers, maize growers, perception, Mann Whitney 'U' test

#### Introduction

Throughout history, mankind has made progress by combining beliefs with scientific discoveries. This evolution extended to agriculture, leading to the advent of green revolution technology, these technologies introduced high-yielding crop varieties that responded well to higher doses of chemical fertilizers and irrigation, encouraging farmers to adopt intensive monocropping methods. During the 1960-70s, this boosted the country's food production by 5 to 10 times (Dasgupta, 1977) [3]. However, with the success of green revolution, it brought consequences in the following decades, inflicting damage on human health, ecosystem and agriculture itself. Research indicates that the enhanced use of chemicals in agriculture has led to a resurgence of pests. The repercussions include the presence of pesticide residues exceeding prescribed limits in drinking water and air, loss of biodiversity, nitrate leaching, groundwater pollution and the accumulation of heavy metals in the soil (John, 2021) [6]. The easy accessibility of toxic chemicals has even contributed to suicidal deaths in villages and their indiscriminate use has led to a decline in pollinator populations. The overall cultivation cost was also significantly higher in input intensive conventional farming (Ranjeetha, 2022) [9]. The issues mentioned above seem to create a challenging situation for small, marginal, tenant farmers and poses a threat sustainability of agriculture. Consequently, Indian farmers find themselves caught in a perpetual cycle of debt, leading to increased distress. As a

response to this, a worldwide movement towards alternative, low-input agriculture is gaining momentum as a feasible solution.

Natural farming, in particular, is gaining importance as a safe and sustainable farming method. It is considered as agroecology based diversified farming system which integrates crops, trees and livestock with functional biodiversity (Rosset, 2012) [11]. The main components of natural farming include Beejamrutha, Jeevamrutha, Mulching and Whapasa. In a more holistic approach, it focuses on use of local seeds, no external inputs, use of cover crops and mulching, on farm made microbial inoculants, mixed cropping, integration livestock, water and moisture conservation. Natural farming can be seen as effective approach to decrease farmers' reliance on costly chemical inputs, it reduces the cultivation cost by focusing on traditional practices which contributes to enhanced soil health (Duddigan, 2022) [4]. The Indian Government has been supporting natural farming through various schemes such as Bharatiya Prakrutik Krishi Paddhati (BPKP), National Mission on Natural Farming, Andhra Pradesh Community based Natural Farming. In the same light, the government of Karnataka has started the natural farming project in 2018 in collaboration with state agricultural universities and State Department of Agriculture.

With this backdrop, recognizing the significance of natural farming in establishing sustainable and profitable production systems for farmers and households, an attempt

was made to examine the perception of farmers towards natural farming. It also seeks to identify the challenges faced by farmers in adopting natural farming practices and proposes potential solutions to overcome these challenges. Therefore, the objectives of this study were as follows:

- To study the perception of farmers towards natural farming.
- To identify the constraints faced by the farmers in natural farming and seek their suggestions to overcome the constraints.

**Materials and Methods**

The *ex-post facto* design was used in this study to suit the objective. The study was conducted in 2022-23 in Chikkaballapur district of Karnataka. The study area known as zone 5, had seen the initiation of a natural farming project back in 2018 and 2023. Notably, among the practitioners of natural farming in this zone, Chikkaballapur stood out with a significant count of more than 250 farmers adopting this approach. Among the farmers practicing natural farming, ragi and maize growers were significant in number. A sample of 120 farmers practicing natural farming in Chikkaballapur district were selected for the study, 60 farmers cultivating Ragi under natural farming and 60 farmers cultivating Maize under natural farming were selected as respondents. The respondents belonged to Chikkaballapura, Siddlaghatta, Chintamani, Gudibande, Gauribidnur and Bagepalli taluks.

Perception is operationalized in the present study as perceived understanding of usefulness and interpretation about various aspects of Natural farming practices through their experiences. In the present investigation, the schedule developed by Zala Prashantkumar (2021) [13] was used to assess the perception of farmers towards natural farming. Based on the literature and discussion with experts, finally 18 statements regarding natural farming were prepared. The respondents were requested to express their opinions for each statement using a five-point continuum namely strongly agree, agree, undecided, disagree and strongly disagree with scores of 5, 4, 3, 2 and 1 respectively. Thus,

after computing the perception score, the respondents were grouped into poor, average and better perception categories by utilizing mean and standard deviation as indicators for validation.

Constraints related to natural farming practices were documented and were graded on a scale of larger, moderate and lesser extents. Scores were assigned accordingly, with "3" for larger extent, "2" for moderate extent and "1" for lesser extent. The summed scores were then ranked based on mean score. Additionally, suggestions to overcome these constraints were documented through closed-ended questions, with responses scored based on their perceived importance i.e., "3" for very important, "2" for important and "1" for less important. The scores for individual statements were totalled and rankings were assigned accordingly.

**Results and Discussion**

**Perception, of farmers towards natural farming**

The farmers', perception was analyzed in the form of overall perception, of farmers and item-wise perception towards natural farming. The results in Table 1 revealed that nearly half (46.66%) of farmers had an average perception towards natural farming, followed by poor (29.17%) and better (24.17%) perception. While among ragi growers, exactly four fifth (80.00%) of farmers belonged to average to better perception, remaining 20 percent had poor perception. Whereas in case of maize growers, more than four fifth (83.33%) of farmers belonged to poor to average perception towards natural farming, followed by better (16.67%) perception.

The variations in perception among ragi and maize growers could be due to the specific challenges or benefits related with each crop. Ragi growers might find natural farming more compatible with their crop, since ragi is less susceptible to pest and diseases while maize growers could be facing difficulties in transitioning, because maize is more responsive to inorganic fertilizers and is more prone to pest and diseases. The findings are in similarity with Priya (2019) [8] and Asha (2021) [11].

**Table 1:** Perception of farmers towards natural farming (n=120)

Sl. No.	Perception	Criteria	Ragi Growers (n <sub>1</sub> = 60)		Maize Growers (n <sub>2</sub> = 60)		Total (n=120)	
			No.	%	No.	%	No.	%
1	Poor	< 63.18	12	20.00	23	38.33	35	29.17
2	Average	63.18 – 71.20	29	48.33	27	45.00	56	46.67
3	Better	> 71.20	19	31.67	10	16.67	29	24.17
Mean: 67.19 SD: 8.01								

To gain a deeper insight into the perception levels of both ragi and maize growers, detailed analysis was conducted,

presenting the findings in Table 2 for a clear and structured overview.

**Table 2:** Statement wise perception of farmers towards natural farming (n=120)

Sl. No.	Statements	Ragi Growers (n <sub>1</sub> = 60)		Maize Growers (n <sub>2</sub> = 60)		Total (n=120)	
		Mean Score	Rank	Mean Score	Rank	Mean Score	Rank
1	NF promotes the growth of micro-organisms, natural enemies and earthworms in soil	4.48	I	4.43	I	4.46	I
2	NF helps in sustainable soil fertility and productivity by way of organic waste recycling	4.40	II	4.38	II	4.39	II
3	NF practices can contribute to a healthier and safer food supply.	4.22	III	4.27	III	4.24	III
4	NF practices often incorporate the use of locally adapted or indigenous livestock breeds.	3.98	VI	3.98	IV	3.98	IV
5	By adopting NF practices, farmers can achieve sustainable yields without	4.03	IV	3.62	IX	3.83	V

	compromising the health of the soil or surrounding ecosystems.						
6	NF practices can help preserve traditional farming knowledge and practices.	3.95	VII	3.63	VIII	3.80	VI
7	NF inputs are easy to procure within the village	3.88	IX	3.70	VI	3.79	VII
8	It is possible to sell NF produce at a higher price as per demand	3.87	X	3.68	VII	3.78	VIII
9	NF reduces environmental pollution and negative health effects.	3.72	XIII	3.83	V	3.77	IX
10	NF practices can reduce the use of chemical inputs such as pesticides and fertilizers.	4.02	V	3.35	XIII	3.68	X
11	NF is scientific and consists of evidence-based practices	3.85	XI	3.50	X	3.65	XI
12	Practicing NF reduces cost of cultivation as it often doesn't require externally purchased inputs	3.90	VIII	3.32	XIV	3.61	XII
13	NF is a boon to farmers in the present farming situation	3.60	XIV	3.47	XI	3.53	XIII
14	NF is effective and yield quality crops	3.52	XV	3.43	XII	3.48	XIV
15	NF practices can be more profitable in the long run than conventional farming practices.	3.77	XII	3.08	XVII	3.43	XV
16	NF practices can help build resilience in the face of climate change and other challenges.	3.28	XVIII	3.25	XV	3.27	XVI
17	It is worthful to adopt NF practices even by suffering the initial setbacks or low yields	3.50	XVI	3.00	XVIII	3.25	XVII
18	Natural faming should be practiced collectively	3.37	XVII	3.12	XVI	3.24	XVIII

Note: NF= natural farming

In all categories, farmers had a better perception for following statements: natural farming promotes the growth of micro-organisms, natural enemies and earthworms in soil (Rank I) with average scores of 4.48, 4.43 and 4.46. natural farming helps in sustainable soil fertility and productivity by way of organic waste recycling (Rank II) with average scores of 4.40, 4.38 and 4.39, natural farming practices can contribute to a healthier and safer food supply (Rank III) with average scores of 4.22, 4.27 and 4.24 among all categories respectively.

With respect to ragi growers, farmers had the perception for the following statements: By adopting natural farming practices, farmers can achieve sustainable yields without compromising the health of the soil or surrounding ecosystems (Rank IV) with a mean score of 4.03, natural farming practices can reduce the use of chemical inputs such as pesticides and fertilizers (Rank V) with a mean score of 4.02. It is worthful to adopt natural farming practices even by suffering the initial setbacks or low yields (Rank XVI) with a mean score of 3.50, Natural faming should be practiced collectively (Rank XVII) with a mean score of 3.37, natural farming practices can help build resilience in the face of climate change and other challenges (Rank XVIII) with a mean score of 3.28.

Further in case of maize growers, natural farming practices often incorporate the use of locally adapted or indigenous livestock breeds (Rank IV) with a mean score of 3.98, natural farming reduces environmental pollution and

negative health effects (Rank V) with a mean score of 3.83. Natural faming should be practiced collectively (Rank XVI) with a mean score of 3.12, natural farming practices can be more profitable in the long run than conventional farming practices (Rank XVII) with a mean score of 3.08. It is worthful to adopt natural farming practices even by suffering the initial setbacks or low yields (Rank XVIII) with a mean score of 3.00.

Farmers' positive perception of natural farming may come from their experience with its benefits, including production of balanced and nutritious food, increased productivity and economic gains. Active participation in extension activities favored their positive perception. However, some farmers express concerns about climate resilience, low initial yields and view natural farming as more suitable for economically stable farmers rather than a practice for everyone.

**Comparison of perception of ragi and maize growers towards natural farming**

From Table 3, it is clear that there is significance difference (Z=2.955) between ragi and maize growers with their perception towards natural farming at five percent level of significance. Ragi growers had higher perception (Mean rank = 69.85) than Maize growers (Mean rank = 51.15). Relatively higher information seeking behaviour, better extension participation, better innovative proneness and knowledge enabled them to have better perception towards natural farming than maize growers,

**Table 3:** Comparison of perception of ragi and maize growers towards natural farming (n=120)

Sl. No.	Categories	Perception		Mann-Whitney U test 'Z' value
		Mean Rank	Sum of ranks	
1	Ragi growers (n1 =60)	69.85	4191.00	2.955*
2	Maize growers (n2 =60)	51.15	3069.00	

**Constraints faced by farmers practicing natural farming**

It was observed from Table 4 that constraints faced by the growers practicing natural farming were low yield in initial years ranked first followed by all asthras in natural farming can be used only as a preventive measure (Rank II), Lack of certification and marketing facilities for natural farming produce (Rank III), Lack of availability of desi cow dung,

urine and desi seeds (Rank IV), non-availability of commercial formulations of natural farming (Rank V), farmers are unaware about information on natural farming practices (Rank VI), difficulty in weed management (Rank VII) and lack of proper extension activities like training and demonstration regarding natural farming practices (Rank VIII).

**Table 4:** Rank wise constraints faced by farmers practicing natural farming (n=120)

Sl. No.	Constraints	Ragi Growers (n <sub>1</sub> = 60)		Maize Growers (n <sub>2</sub> = 60)		Total (n=120)	
		Mean Score	Rank	Mean Score	Rank	Mean Score	Rank
1	Low yield in initial years	2.78	I	2.88	I	2.83	I
2	All asthras in natural farming can be used only as a preventive measure	2.68	III	2.62	II	2.65	II
3	Lack of certification and marketing facilities for natural farming produce	2.60	IV	2.55	III	2.57	III
4	Lack of availability of desi cow dung, urine and desi seeds	2.40	VI	2.50	IV	2.46	IV
5	Non-availability of commercial formulations of natural farming	2.70	II	2.12	VI	2.41	V
6	Farmers are unaware about information on natural farming practices	2.47	V	2.25	V	2.36	VI
7	Difficulty in weed management	1.88	VIII	1.87	VII	1.88	VII
8	Lack of proper extension activities viz. training, demonstration regarding natural farming practices	1.90	VII	1.72	VIII	1.81	VIII

The possible reasons for the above result might be attributed to the initial lower yields during the transition from conventional to natural farming, as farms take time to adapt and stabilize under natural farming practices. Additionally, the perceived ineffectiveness of preventive plant protection measures, lack of certification for natural farming produce and the sale of chemical-free produce at conventional prices contribute to farmers' reluctance. Despite awareness through extension activities, farmers remain hesitant to adopt natural farming on their own farms. The trends are in similarity with Jadhav (2020)<sup>[5]</sup>, Rao (2021)<sup>[10]</sup> and Kumar (2023)<sup>[7]</sup>.

**Suggestions to overcome the constraints faced by farmers practicing natural farming:** The data in Table 5 indicates the suggestions given by farmers to overcome the

constraints, among all the suggestions first place was given to support or subsidy for initial 3 years to withstand yield loss followed by all plant protection measures should be imposed in anticipation of pest and diseases (Rank II), Government should create enough certification and marketing facilities for natural farming produce, so that it provides better price to produce(Rank III), Farmers should start producing desi seeds (Rank IV), Farmers can approach goshalas for procuring desi cow dung, urine (Rank V), natural pesticides and fungicides should be made available to farmers (Rank VI), Awareness programmes should be carried out for both the farmers and consumers (Rank VII), Effective mulching can solve the problem of weeds (Rank VIII).

**Table 5:** Rank wise suggestions to the constraints faced by farmers practicing natural farming

Sl. No.	Suggestions	Ragi Growers (n <sub>1</sub> = 60)		Maize Growers (n <sub>2</sub> = 60)		Total (n=120)	
		Mean Score	Rank	Mean Score	Rank	Mean Score	Rank
1	Support or subsidy for initial 3 years to withstand yield loss	2.57	II	2.83	I	2.70	I
2	All plant protection measures should be imposed in anticipation of pest and diseases	2.68	I	2.67	II	2.68	II
3	Government should create enough certification and marketing facilities for natural farming produce, so that it provides better price to produce	2.52	III	2.62	III	2.57	III
4	Farmers should start producing desi seeds	2.47	V	2.50	IV	2.48	IV
5	Farmers can approach goshalas for procuring desi cow dung, urine	2.50	IV	2.25	VI	2.38	V
6	Natural pesticides and fungicides should be made available to farmers	2.30	VI	2.40	V	2.35	VI
7	Awareness programmes should be carried out for both the farmers and consumers	1.68	VIII	1.60	VIII	1.87	VII
8	Effective mulching can solve the problem of weeds	1.75	VII	1.98	VII	1.63	VIII

These suggestions might be due to the constraints of natural farming, such as lower yields in the initial years. Farmers recommend providing support during this transition, emphasizing the need for effective plant protection measures to manage pests and diseases. They advocate for the establishment of certification and marketing facilities for natural farming, similar to organic farming, to ensure better prices for chemical-free produce. Additionally, farmers suggest promoting the use of indigenous seeds suitable for natural farming and obtaining cow dung and urine from local goshalas for formulations. While mulching is considered less important for field crops, it is deemed suitable for horticulture and sericulture crops. The findings are in concordance with Damor (2013)<sup>[2]</sup> and Sarada (2018)<sup>[12]</sup>.

**Conclusion**

The study results revealed that significant number of farmers had an average perception towards natural farming, whereas ragi growers had much better perception towards natural farming than maize growers, because ragi as well as similar millet crops were more responsive to natural farming practices and had lesser constraints in cultivation when compared to maize, important constraints expressed by growers were low initial yields, pest and disease management, inadequate certification and marketing infrastructure, these constraints could be overcome by providing support during the initial phase of shifting from conventional to natural farming, by developing and disseminating better pest and management strategies, government can encourage NGOs, FPOs and other grass

root level institutions to network as exclusive outlets at prime places for natural farming produce, so that it provides a better marketing opportunity. These findings give us important information about how farmers perceive and use natural farming, further, propose targeted interventions for its sustainable implementation in agricultural practices.

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