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# Cow-Based Zero Budget Natural Agricultural Practises for Underprivileged Farmers

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**Abstract**

The importance of eating nutritious and chemical-free foods is increasingly increasing. Consumers are willing to pay more for high-quality produce. To achieve economic empowerment, farmers must seize this entrepreneurial potential. In this context, one such attempt by a farmers' interest group was examined. In the paper, the formation as well as behaviour of the group, as well as the group dynamics of the group members, were investigated and discussed. Using the case study process, first-hand information was gathered through a well-planned interview programme, in-depth interviews with community participants, and the researcher's crucial findings. The Group Dynamics Index (GDI) was created to assess the dynamics of a group of people. This paper aims to reveal a better agricultural method for poor and marginal land owners in order to increase their profits. Farmers are being motivated to invest less and grow more under the zero-budget natural farming scheme. Jivamrut and Dashparniark, which are made from cow dung and urine, are used by farmers. This has resulted in improved soil beneficial micro and macro flora and fauna, as well as a 40 to 45 percent reduction in agricultural costs. Farmers make a lot of money as they go to the shop to sell their products. This has resurrected the conventional mixed-cropping method and reduced farmers' reliance on the demand for seeds and inputs.

**Keywords:** ATMA (Agricultural Technology Management Agency), Cow based natural farming, Farmer Interest Group (FIG), Group dynamics

## Introduction

People choose organic food because of the importance of living a healthier life and reports of many side effects from the use of toxic pesticides in processing, artificial ripening agents, and saving food products. Consumption of organic products is growing, according to Kamal et al. (2009); however, product growth and advances in registration, manufacturing, labelling, and packaging are required to further stimulate demand. He also reported that 39% of respondents believe the additional cost of organic food is fair. Farmers have a fantastic ability to produce goods that are in high demand and sell at a profit. Agricultural experts are unable to include the most research knowledge on sustainable farming and organic agriculture since it is not included in the agricultural sciences curriculum [1].

Several nongovernmental groups, social entrepreneurs, hobbyists, and fishermen, all relying on ITK, share such useful knowledge on organic agriculture at the same time. On these types of information sources, farmers are often favoured. Farmers' common sources of intelligence, according to Sharma (2014), are community leader's/family members (84.25 percent) and friends/neighbours/group members (52.25 percent). He went on to say that newspapers, television, and radio are both relevant and reliable sources of knowledge for farmers. Motivated farmers have seen significant changes in their lives as a result of using such natural agricultural methods [2].

This paper investigates and discusses one such farming community. A community of twenty-six people was founded after it began with just three people. Farmers were drawn to Sri Shubhash Palekar's natural farming system after reading a news storey in a popular newspaper. Since they were effective with this farming technique, the majority of the members eventually joined in. According to these farmers, the cost of paddy production cultivation was relatively low, costing about four thousand rupees per acre. Despite producing their own pesticides and fertilisers from cow urine and dung as well as other naturally available organic products, they were still able to harvest the same amount of farm produce, namely 30 bags of paddy per acre (2 to 2.4

tonnes). Furthermore, they were selling each bag of rice for a thousand rupees more than average rice cultivation (with usage of synthetic pesticides and fertilisers for cultivation) [3].

With the aid of ATMA, they had developed their own bazaar channel as well as were transferring whole yield to the nearest municipal towns. ATMA assisted them by introducing them to various non-pesticide management activities and financially supporting (granted four thousand rupees to each member) the establishment of concrete platforms to bind the desi cow (cows indigenous to India) on it and for easier collection of cow's urines. ATMA also made attempts to locate a market in which to sell their pesticide-free natural food product at the best possible price. Farmers in this community are currently attempting to create a farmer's company to market cow-based pesticides and fertilisers to needy farmers in order to promote natural farming among farmers who do not own a desi cow [4].

Kamalnayan Jamnalal Bajaj Foundation identified Wardha as a distress district in Maharashtra's Vidarbha region. Wardha's economy is largely focused on agro-based livelihoods, primarily agriculture. Today's farmer faces challenges such as poor productivity, high production prices, crop loss due to adverse weather conditions, disease and pest attacks, and damage from wild animals. Higher doses of chemical fertilisers and pesticides, as well as planting a single crop every year, were cited by farmers as explanations for the unfavourable agrarian condition. To alleviate the pressure, KJBF implemented a zero-budget natural farming intervention and promoted climate-resilient cropping patterns [5].

**LITERATURE REVIEW**

A. Amare *et al*. developed to collaborate with nature to produce nutritious food, keep ourselves healthy, and keep the soil healthy through natural farming. Because of its simplicity and cost efficiency, the ancient method of natural farming is best suited for farming. Natural farming contributes to the health, prosperity, and long-term viability of agricultural ecosystems. The four pillars of ZNBF are Bijamrit application, Jiwamrit application, Mulching, and Wafasa condition formation. Bijamrit prevents young roots from fungi, as well as soil-borne and seed-borne diseases that usually affect plants following the monsoon season. *Jiwamrit not only supplies nutrients, but it also serves as a catalytic agent in the soil, encouraging the activity of beneficial microorganisms [6]*.

I. Badgley *et al*. *mulching creates the ideal microclimate for microbe formation. It also produces Wafasa, which maintains the required moisture level for plant growth.* Since these formulations are made from dung, urine of indigenous cows, jaggery, pulses starch, and bitter plant leaves found in the farm's vicinity, natural farming lowers the cost of inputs. There has been a lot of debate lately about natural farming. This was reiterated when India's Finance Minister reacted to farmers' frustration during the budget session in July 2019 by saying, "We shall go back to basics on one count: zero budget farming." It isn't a brand-new concept. This ground-breaking model must be replicated." Subhash Palekar, a Padma Shri awardee, has called for Zero Budget Natural Farming (ZBNF) with no external inputs of any kind, including finance, for decades [7].

Y. Singh Bagal *et al*. since 2015-16, the government of Andhra Pradesh has been testing it in select blocks of 13 districts, where rice is the staple food and accounts for 30% of the cropped area. Ghanamrutham and Jeevamrutham (liquid) are the two main natural inputs that are called chemical fertiliser replacements under ZBNF. By the end of 2018, around 1.6 lakh farmers had embraced it, with the government planning to hit five lakh farmers by 2024. Scaling it up to the whole state in the next few years would cost an extra 15,000 crore. A research was undertaken in this sense to see how the technique has cut development costs and doubled farmer incomes. When opposed to non-adopter lands, ZBNF was found to have partially increased soil quality, probably due to the rapid development of heterotrophic microbial communities and flora [8].

P. S. Brar *et al*. states the ability of organic manures with cow urine to enhance soil microbes in N fixation and P solubilization has been demonstrated in numerous studies. Farmers cited the opportunity to grow chemical-free food and lower fertiliser and pesticide prices as the key reasons for implementing ZBNF. Despite widespread adoption of the technology, activism is only achievable if the farmer's net returns and effects on consumer prices are well known. Farmers' interest group (FIG) Karshakananda Rythumitra is from the village Allipudi in the

southern state of India. The group dynamics index (GDI) is created to assess the subtleties of the assembly. The selected metrics under each dimension were defined by a semi-structured interview plan. The C values for the ranks were calculated using the Guilford equation [9].

A. Khadse *et al*. studied using the researcher's crucial observations of real field conditions, procedures adopted for natural fertilisers, pesticide preparations, and standing crop results. Mr. Naganna Dora headed this party, and he and all of the other participants were interviewed for this report. The Kamalnayan Jamnalal Bajaj Foundation has been directing and empowering farmers through various capacity-building initiatives such as village meetings, demonstrations of ZBNF techniques (Jiwamrit, Ghanjiwamrit, Dashparni arka, Agnestra, and others), trainings, and field exposures at various stages of crop development. Aside from that, demonstration plots were maintained in each village to help farmers understand the value of using the right technique for the right crop. The demonstration of intercropping and mixed cropping models helped to dispel farmers' concerns and expanded adoption as farmers saw the advantages of mitigating the consequences of climate change [10].

**METHODOLOGY**

1. *Design:*

The Joint Director of Agriculture (JDA) provided inputs for the selection of mandalas at the district level, and Mandal Agricultural Officers assisted in the selection of one village from each mandala (MAO). Farmers are picked at random from a list of ZBNF adopters received from MAO. The original research sample included 65 respondents, five ZBNF farmers from each of Andhra Pradesh's 13 districts; however, due to the survey, an additional 32 respondents were included in the sample, taking the total sample size to 97. The study's key aim is to determine the effect of Jeevamrutham/Ghanamrutham on production, cultivation costs, and net returns. To examine their chemical properties, four Ghanamrutham samples (two each from East Godavari and West Godavari districts) and two Jeevamrutham samples (one each from East Godavari and West Godavari districts) were obtained. Similarly, four soil samples from treated plots and four soil samples from control plots where paddy is the main crop and Ghanamrutham has been added were chosen for chemical analysis. The soil is taken from the same East and West Godavari villages where Ghanamrutham was taken and applied.

2. *Sample*:

The community frontrunner was a alumnus, besides the founders were much interested in the assembly because founders saw broadcasters as the next utmost critical medium of leeway communication subsequently radical farmers. The community leader was a graduate, and the founders were very interested in this group. This community piqued the founders' attention because, after radical growers, they saw mass media as the second most significant means of extension communication.

3. *Instrument*:

The city representative was a graduate, and the founders were enthusiastic about the organisation. In this article, Fig. 1 and Fig. 2 show the specifics of educational qualifications and their preferred method of extension touch. Agriculture is the main profession of all members, and fourteen of the twenty-six members hold desi cows. In this group, just three farmers possess land of 4.9 to 9.9 in acre. Just 5 acres of land was held by the remaining farmers. And half of the participants are small-scale farmer (keep cows of desi breed, get 2.9 to 3.9 litres on average of milk per day, and, sell the rest of the milk to earn extra money after fulfilling self-daily needs). The group dynamics were assessed using the researcher's established group dynamics index (GDI) (Fig. 3).

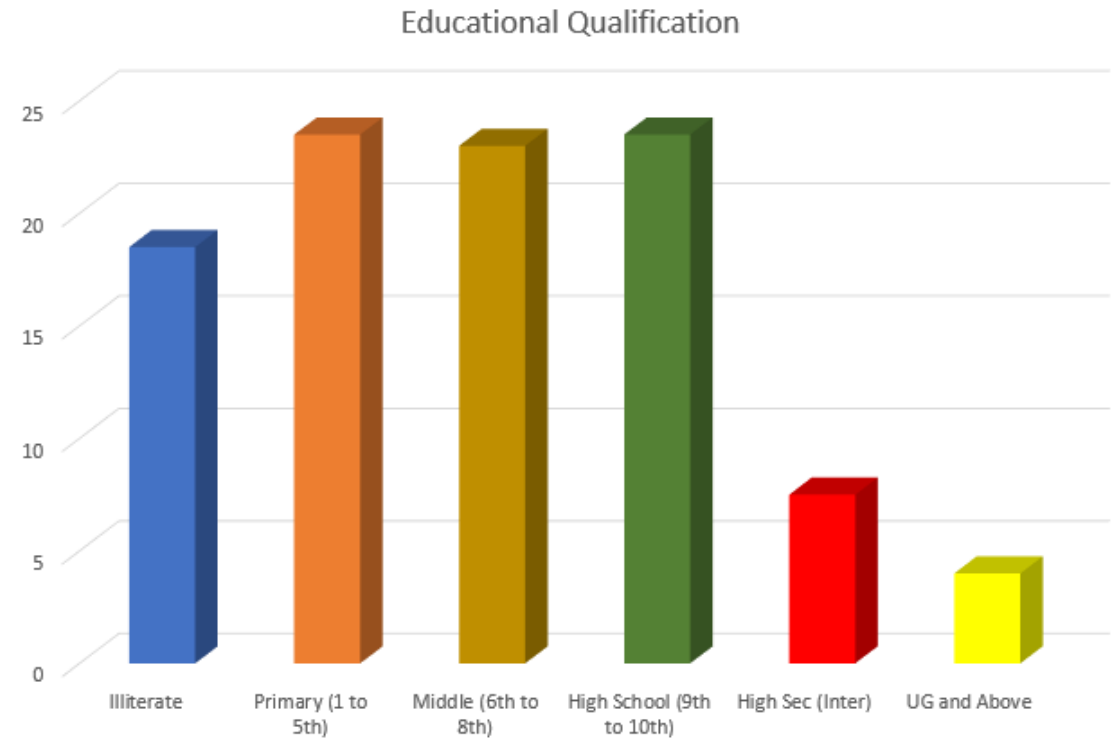


**Fig. 1: Members of the Party Have Varying Levels of Education**

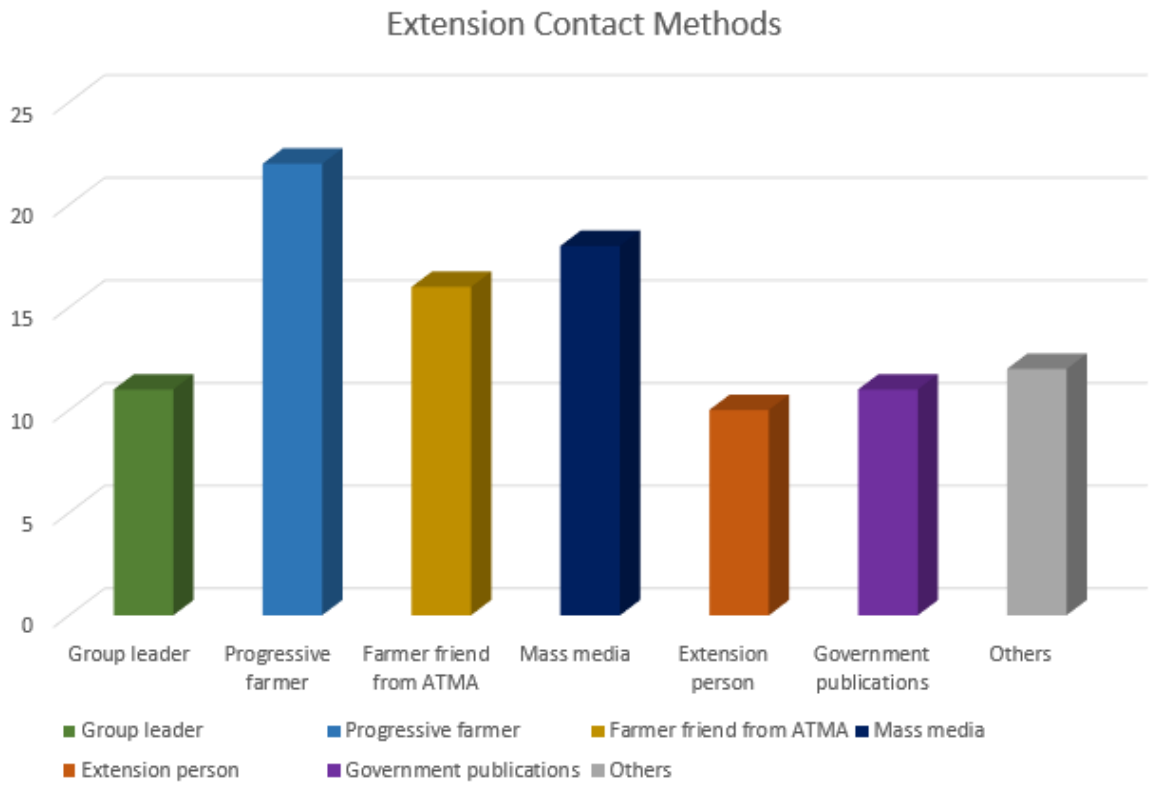


**Fig. 2: Defendants Favourite for Leeway Interaction**

*4. Data Collection:*

The ten dimensions of the group dynamics index developed for this study are: participation in the group, teamwork, decision-making process, group cohesiveness, group leadership style, group contact, interpersonal confidence, role structure, conformity to group norms, and goal attainment. A number of indicators were added under each dimension after the relevancy review. Each GDI dimension has a different number of metrics and therefore a different set of overall scores. As a result, the cumulative score for each dimension was translated to a unit score using the formula below.

$$Uij = \frac{Yij - MinYij}{MaxYj - MinYj}$$

Where,

$MaxY_j$ = minimum score upon $j^{th}$ dimension

$MinY_j$ = maximum score upon $j^{th}$ dimension

$Y_{ij}$ = value upon $j^{th}$ dimension of $i^{th}$ defendant

$U_{ij}$ = Unit score upon $j^{th}$ dimension of $i^{th}$ defendant

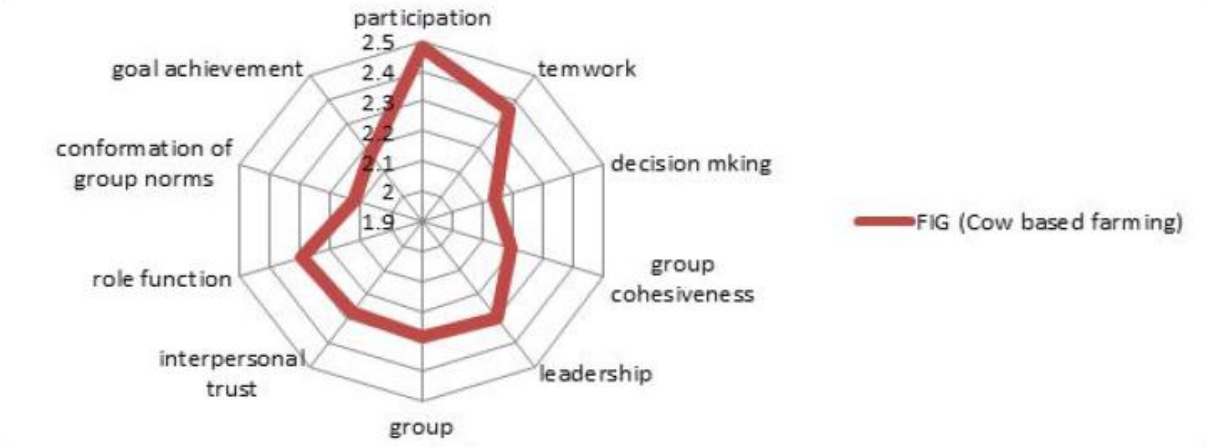


**Fig. 3: This Group's Group Dynamics Index Is Compared Across Dimensions**

5. *Data Analysis:*

As a result, each dimension's score ranges when $Y_{ij}$ is lowest from 0.01 to 0.99, i.e., the $Y_{ij}$ is highest, the score is 0.09 and when the score is 0.01. After that, each respondent's unit score was compounded by the corresponding scale value of all dimension, besides the total was calculated. The observed score was then separated by the number of scale value to obtain index score value for all defendant. Table 1 shows the results of each respondent's ratings. The group's group dynamics ranking is 0.637.

$$GDIi = \frac{\sum Uij \times Sj}{Sum\ of\ scale\ values}$$

Where,

$S_j$ = the $j^{th}$ component for Scale value

$U_{ij}$ = upon $j^{th}$ dimension Unit score of ith respondent

$GDI_i$ = ith defendant for Group dynamics index score

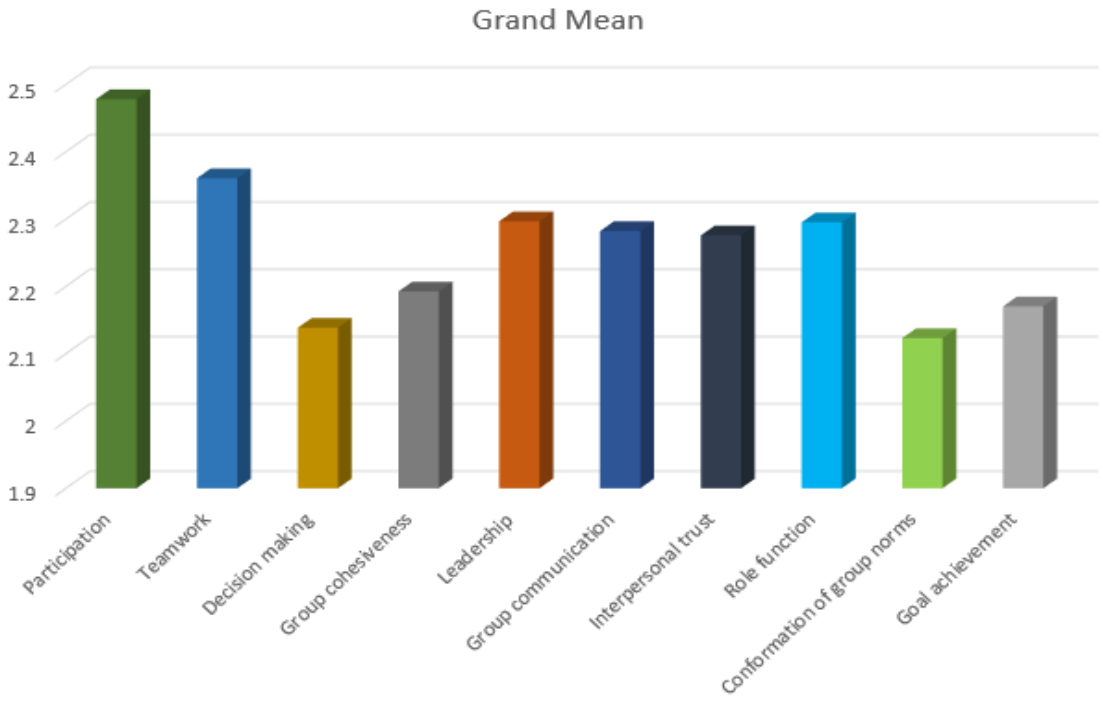


**Fig. 4: Group Score for Each Dimension**

**Table 1: Members of the Group and Their Group Dynamics Index (GDI) Score**

| Respondents | GDI score |
|---|---|
| 1 | 0.497946 |
| 2 | 0.538485 |
| 3 | 0.777260 |
| 4 | 0.763525 |
| 5 | 0.533640 |
| 6 | 0.789735 |
| 7 | 0.676573 |
| 8 | 0.598652 |
| 9 | 0.521173 |
| 10 | 0.503007 |
| 11 | 0.692568 |
| 12 | 0.726786 |
| 13 | 0.77709 |
| 14 | 0.672127 |

| | |
|---|---|
| 15 | 0.594566 |
| 16 | 0.525616 |
| 17 | 0.51155 |
| 18 | 0.688480 |
| 19 | 0.724226 |
| 20 | 0.740857 |
| 21 | 0.686912 |
| 22 | 0.589433 |
| 23 | 0.516039 |
| 24 | 0.501962 |
| 25 | 0.688480 |
| 26 | 0.733805 |

**RESULT & DISCUSSION**

According to the report, the highest score given to members of the party is 2.478, followed by coordination (2.360), leadership (2.296), and so on. The scores obtained for each dimension are shown in Fig. 4. Farmers have been motivated in many areas, according to the report, including their involvement in growth programmes, enhanced communication and leadership abilities, and the active maintenance of their involved party. Farmers learned to request assistance from the extension system, and they discovered that service providers listened to their concerns. Enrolment in this group increased their social standing. Finally, the low cost of cultivation and high returns from the farming system they embraced were the only factors that allowed these small and marginal farmers to achieve economic empowerment.

It was a tried and true farming technique that they had been using for more than five years. Farmers were eager to share their agricultural methods with the rest of the farming world as a result of their adaptive trials. This paper discusses a few main procedures and economics. Natural farming dependent on cows: These seasoned farmers assert which one cow of desi breed is adequate to sustain up to land of 59.9 acres. Farmer assists co-farmer who are unable to maintain cows of desi breed. They work together as a crew, sharing contributions and labour, assisting one another and producing the desired outcomes. They sell to neighbouring metropolitan cities after combining all of their products. Farmers who follow such activities would spend no more than four thousand rupees on cultivation, which is a relatively low expense (with synthetic fertilisers besides pesticides in their locality the cost of cultivation is Rs 19,999 to 24,999 per acre).

In terms of field mechanisation, manual weed control, transplanting, and harvesting, this form of farming would be similar to traditional farming. They make their own fertilisers, pesticides, fungicides, and growth promoters from locally available materials such as cow manure, cow dung, as well as the other natural contributions. Fertilizers that they store besides use include: Ghana jeevamrutam (solid fertiliser) and Drava jeevamrutam (liquid fertiliser) are two kinds of fertilisers that they typically use (liquid fertilizer). They prepared and used a variety of pesticides.

Decoction made with Aegle marmelos, Asafoetida, as well as the fermented buttermilk were sprayed on any disease that needed to be managed. Table 2 lists the specifics of pesticides and fungicides, as well as their uses. Both main ingredients are naturally present and often free of charge, such as weeds, forest tree species, and so on. Farmers who follow these methods won't have to invest any more money on crop protection. These products

are applied by community members according to the stage of the crop to deter pests and diseases from infecting the paddy crop. The Farmer is highly positive about the product, besides their popularity has just helped to inspire co-farmer to link them.

**Table 2: Members of The Community Used Natural Pesticides and Fungicides**.

| **Pesticides / Fungicides** | **Use** |
|---|---|
| Neemastram | To control sucking pests and small insects |
| Agni astram | To control borers, caterpillars |
| Brahmas tram | To control leave eating larvae |
| Decoction from *Aegle marmelos* | To avoid and control blast diseases |
| Fermented buttermilk | To avoid and control all type of spots on leaves and fruits etc. |
| Asafoetida decoction | To avoid and control bacterial diseases and best used for paddy sheath blight |

In addition, the researchers found a healthy crop with a significant number of tillers on freshly cultivated land. The researcher noted the farmers' concern for crop safety and improvement, as well as their eagerness to share their expertise. The true success is in finding the correct demand for the crop, with farmer trading thousands of rupees extra for a single rice bag grown naturally. Members of the community have formed a very strong bazaar channel as well as are exporting the yield to the nearby municipal towns with the aid of ATMA and a few other outlets. These farmers claim that this form of farming generates more profits at a lower cost of agriculture, and that it often provides customers with a healthier lifestyle since no pesticides are used in the manufacturing process.

## CONCLUSION

This style of case study is very unique to the field. There has been no experimental investigation to date to verify this form of uplift practise for wide spectrum use. Agricultural practitioners, without a doubt, lack such expertise. Adaptive experiments are the only way for interested farmers to practise. This paper provides a case for politicians to incorporate issues including organic farming, zero-budget natural farming, and other similar topics in agricultural science curricula. This FIG is a living example of farmers establishing their own community with the aid of the extension agency ATMA. Farmers' contributions should be recognised by extension practitioners, who should support them by providing successful service. Farmers will pursue cow-based natural farming for the first time after visiting such farms and having first-hand experience. This style of farming, is expect, will thrive in India's ever-green transition, ensuring food security for consumers and economic stability for vulnerable, rural, and poor farmers.

## REFERENCES

1. K. P. Aryal, P. Chaudhary, S. Pandit, and G. Sharma, “Consumers’ Willingness to Pay for Organic Products: A Case From Kathmandu Valley,” J. Agric. Environ., vol. 10, pp. 15–26, 2009, doi: 10.3126/aej.v10i0.2126.

2. H. S. C. Neelam and K. S. Kadian, "Cow based natural farming practice for poor and small land holding farmers: A case study from Andhra Pradesh, India," Agric. Sci. Dig. - A Res. J., vol. 36, no. 4, 2016, doi: 10.18805/asd.v36i4.6468.

3. D. MOSES SHYAM, S. DIXIT, R. NUNE, S. GAJANAN, and G. CHANDER, "Zero Budget Natural Farming - An empirical analysis," Green Farming, vol. 10, no. 6, p. 661, 2019, doi: 10.37322/greenfarming/10.6.2019.661-667.

4. N. H. Sarat Chandra, K. S. Kadian, and R. Baliram Kale, "Identifying the Factors Affecting Coordination among Different Agencies with ATMA in Andhra Pradesh, India," Int. J. Curr. Microbiol. Appl. Sci., vol. 6, no. 11, pp. 890–899, 2017, doi: 10.20546/ijcmas.2017.611.104.

5. J. P. Guilford, Psychometric methods, 2nd ed. 1954.

6. A. Amare and B. Simane, "Determinants of smallholder farmers' decision to adopt adaptation options to climate change and variability in the Muger Sub basin of the Upper Blue Nile basin of Ethiopia," Agric. Food Secur., vol. 6, no. 1, 2017, doi: 10.1186/s40066-017-0144-2.

7. I. Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Chappell, M.J., Avilés-Vàzquez, K., Samulon, A., and Perfecto, "Organic agriculture and the global food supply. Renewable Agriculture and Food Systems 22," Renew. Agric. food Syst., vol. 22, no. 2, pp. 86–108, 2007.

8. Y. Singh Bagal, L. K. Sharma, G. P. Kaur, A. Singh, and P. Gupta, "Trends and Patterns in Fertilizer Consumption: A Case Study," Int. J. Curr. Microbiol. Appl. Sci., vol. 7, no. 4, pp. 480–487, 2018, doi: 10.20546/ijcmas.2018.704.056.

9. P. S. Brar, R. Kaushal, and G. Bhardwaj, "A Review on Beneficial Effects of PGPR and Noble Liquid Manures in Enhancing Soil Fertility and Sustainability," Int. J. Curr. Microbiol. Appl. Sci., vol. 8, no. 4, pp. 409–415, 2019, doi: 10.20546/ijcmas.2019.804.045.

10. A. Khadse and P. M. Rosset, "Zero Budget Natural Farming in India–from inception to institutionalization," Agroecol. Sustain. Food Syst., vol. 43, no. 7–8, pp. 848–871, 2019, doi: 10.1080/21683565.2019.1608349.