



## Cow based natural farming practice for poor and small land holding farmers: A case study from Andhra Pradesh, India

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### ABSTRACT

Importance for organic and chemical free food consumption is growing rapidly. Consumers are ready to pay more money to get a quality food. Farmers need to hold this entrepreneurial opportunity to fasten economic empowerment. One such efforts done by a farmers' interest group was studied in this perspective. Formation and conduct of the group along with the group dynamics of the group members was studied and presented in this paper. Adopting case study method first hand information was collected with the help of well prepared interview schedule along with thorough discussions with the group members and by critical observations of the researcher. Group dynamics index (GDI) was developed to measure the group dynamics of the group members. This paper attempts to expose a better farming practice for the poor and marginal land holders to fetch more income to them.

**Key words:** Cow based natural farming, Farmer Interest Group (FIG), ATMA, Group dynamics.

### INTRODUCTION

Importance for healthy life and evidence of several side effects from the usage of synthetic chemicals in farming, artificial ripening agents and preserving food products made people to prefer organic food. Kamal *et al.* (2009) revealed from his study, consumption of organic products is increasing; however, product development and innovations in certification, processing, labelling and packaging are needed to further stimulate demand. Further he stated that 39% of the respondents feel the extra cost for organic food products is reasonable. For farmers really it is a great opportunity to produce demand driven products and sell at a good price. Since it is not included in the curriculum of the agricultural sciences; Agricultural professionals are unable to provide the best scientific information on natural farming and organic cultivation. At the same time several nongovernmental organizations, social activists, hobbyists, several farmers, based on ITKs share such valuable information on organic cultivation. Farmers are also preferred on such kind of information sources. Sharma (2014) revealed that group leaders/family members (84.25%) and friends/ neighbours/ group members (52.25%) are common sources of information for farmers. Further he stated that mass media like news paper, television and radio are important and effective sources for information to farmers. Padmasri Subhash Palekar, an Indian agriculturist who practised and wrote many books about *Zero-Budget Spiritual Farming* usually conducts workshops throughout the country to create awareness about natural farming and motivate

farmers to adopt such natural farming practices. Motivated farmers are following such natural farming practices and had observed great changes in their lives. One of such farming community has been studied and discussed in this paper. There are twenty six members who formed a group, initially started with only three members. The farmers got attracted towards Sri Shubhash Palekar's method of natural farming when they have seen a news article in a popular news paper. When they got succeeded with this farming technique, gradually rest of the members had joined. According to these farmers, their cost of cultivation for the paddy production was comparatively very less i.e., around four thousand rupees only per acre. With their own production of pesticides, fertilizers using cow urine and dung with other naturally available organic materials, nevertheless they were achieving the same quantity of farm produce i.e., 30 bags of paddy in their locality (2 to 2.4 tonnes/ acre). Moreover they were selling each bag of rice a thousand rupees more than the rice grown through normal cultivation (with usage of synthetic pesticides and fertilizers for cultivation). They had found their own market channel with the help of ATMA and exporting whole produce to the nearest metropolitan cities. Agricultural Technology Management Agency (ATMA) has identified their efforts and wanted to strengthen them, ATMA helped them by exposing them to various non pesticide management practices, financially supported (granted four thousand rupees to each member) to establish concrete platforms to tie the desi cow (cows indigenous to India) on it and for easier collection of cow's urine. Further ATMA

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made efforts to find out the market to sell their non pesticide natural food product for a best price. Presently farmers in this group are trying to establish a farmers company to sell cow based pesticides and fertilizers to the needy farmers to encourage natural farming among the farmers without a desi cows.

## MATERIALS AND METHODS

*Karshakananda rythumitra* a Farmers' interest group (FIG) belong to the village Allipudi of East Godavari district in Andhra Pradesh state. *Group dynamics index (GDI)* was prepared to measure its group dynamics. A semi structured interview schedule was well prepared which represented the selected indicators under each dimension. *Guilford* method utilised to obtain C values for the ranks. Researcher's critical observation on actual field conditions, procedures followed for natural fertilizers, pesticides preparations and the standing crop performance was used to study this group. This group was lead by Mr. Naganna Dora and along with him all the group members were interviewed for this study.

## RESULTS AND DISCUSSION

Among the respondents more than eighty percent of them were educated and only 19.23 per cent of them were illiterates. Group leader was a graduate and group members were very active in this group as they preferred mass media as a second most important extension contact method after the progressive farmers. They know the importance of being cosmopolite in getting information, so they prefer to get information from multiple sources other than group leader. The details of educational qualification and their preference of extension contact have been presented in Fig 1 and Fig 2 in this paper. For all members primary occupation is Agriculture and fourteen members out of twenty six are maintaining desi cows. Only three farmers have 5 to 10 acres of land in this group. Remaining farmers hold land up to 5 acres only. Almost all members are marginal to small farmers. (Those who are maintaining desi cows, gets three to four litres of milk per day on average, after meeting their home needs they sell remaining milk and getting additional income.)

The group dynamics was measured with the help of group dynamics index (GDI) prepared by the researcher (Fig 3). Group dynamics index prepared for this research work consists of ten dimensions as Participation in the group, Team work, Decision making procedure, Group cohesiveness, Group leadership style, Group communication, Interpersonal trust, Role function, Conformation to group norms and Goal achievement. After relevancy check number of indicators were added under each dimension. Each dimension of the GDI consists of number of indicators and hence their range of total scores will be different. Therefore, the total score of each dimension was converted into unit score by using the following formula.

$$U_{ij} = \frac{Y_{ij} - \text{Min}Y_{ij}}{\text{Max}Y_j - \text{Min}Y_j}$$

Where,

$U_{ij}$  = Unit score of the  $i^{\text{th}}$  respondent on  $J^{\text{th}}$  dimension

$Y_{ij}$  = value of  $i^{\text{th}}$  respondent on  $J^{\text{th}}$  dimension

$\text{Min}Y_j$  = maximum score on the  $J^{\text{th}}$  dimension

$\text{Max}Y_j$  = minimum score on the  $J^{\text{th}}$  dimension

Thus, the score of each dimension range from 0 to 1 i.e. when  $Y_{ij}$  is minimum, the score is 0 and when the  $Y_{ij}$  is maximum the score is 1. Then the unit score of each respondent was multiplied by respective scale values of each dimension and summed up. Then the score obtained was divided by sum of scale values in order to get the index score values of each respondent. These scores of each respondent were represented in Table 1. Group dynamics score of the group is 0.637.

$$GDI_i = \frac{\sum U_{ij} \times S_j}{\text{Sum of scale values}}$$

Where,

$GDI_i$  = Group dynamics index score of  $i^{\text{th}}$  respondent.

$U_{ij}$  = Unit score of  $i^{\text{th}}$  respondent on  $J^{\text{th}}$  dimension

**Table 1:** Group members along with their Group Dynamics Index (GDI) score

Respondents	GDI score
1	0.497945
2	0.538486
3	0.777261
4	0.763524
5	0.533641
6	0.789734
7	0.676572
8	0.598653
9	0.521172
10	0.503008
11	0.692567
12	0.726787
13	0.7771
14	0.672128
15	0.594565
16	0.525617
17	0.51154
18	0.688479
19	0.724227
20	0.740856
21	0.686913
22	0.589432
23	0.51604
24	0.501963
25	0.688479
26	0.733804

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\*note: Number of dimensions is 10, Three point rating scale used (1, 2, 3), Total sum of scale values = 49.97. C values determined for each rank by Guilford (1954) Table-M.

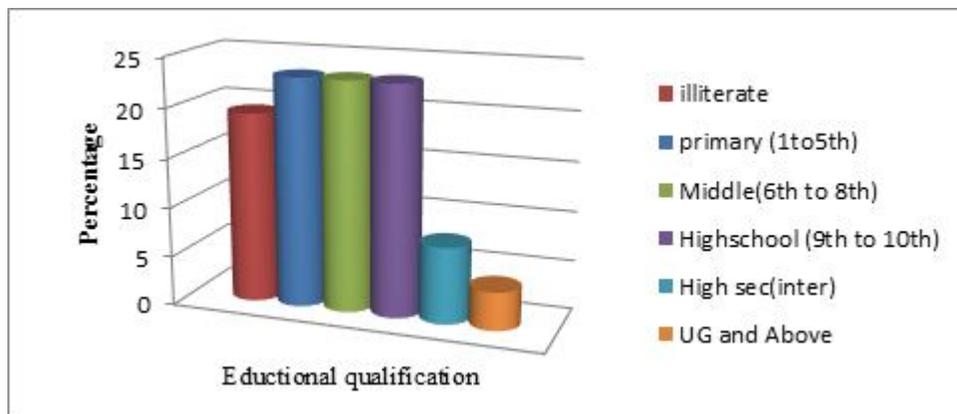


Fig 1: Educational qualification of the group members

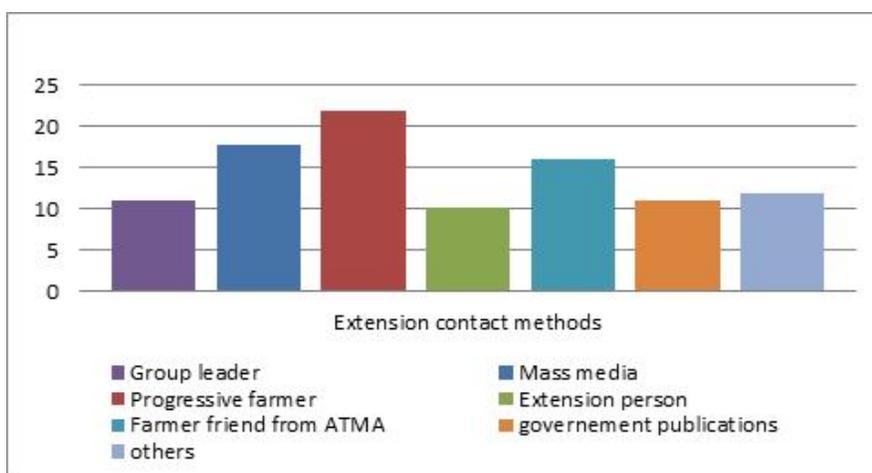


Fig 2: Respondents preference for extension contact

$S_j$  = Scale value of the  $J^{\text{th}}$  component

According to the study, participation of members in the group has highest score (2.478) followed by their teamwork (2.360), leadership (2.296) and so on. The obtained scores under each dimension are represented in the Fig 4. Study revealed that farmers have empowered in several ways; their participation in development activities, improved communication skills and leadership, successful maintenance of their interested group. Farmers learned to seek help from the extension system; they found their voice is heard by the service providers. They improved their social status due to enrolment in this group. Ultimately economic empowerment of these small and marginal farmers has made possible only due to low cost of cultivation and high returns from the method of farming they adopted.

It was proven method of farming since they have adopted for more than five continuous years. Based on their adaptive trials, farmers were very much interested to share their method of farming along with the rest of the farming community. Few salient procedures and economics are discussed in this paper.

**Cow based natural farming:** These experienced farmers are strongly saying that one *desi* cow is sufficient to maintain land up-to sixty acres. Farmers are helping the co farmers who cannot maintain desi cows. As a team they share inputs, labour, mutually helping each other and achieving the results. Combining all their produce, they export to the nearby metropolitan cities. Farmers who ever adopt such practices have to incur only four thousand rupees at most for cost of cultivation, it is comparatively very low cost (20,000 to 25,000 rupees per acre is the cost of cultivation with synthetic fertilizers and pesticides in their locality).

This method of farming won't differ with normal farming in farm mechanization, manual weed management, transplanting and harvesting. The fertilizers, pesticides, fungicides and growth promoters what they are using is made by themselves with naturally available products like cow urine, cow dung and other natural inputs.

**Fertilizers prepared and used by them:** Two types of fertilizers they commonly used are *Ghana jeevamrutam* (solid fertilizer) and *Drava jeevamrutam* (liquid fertilizer).

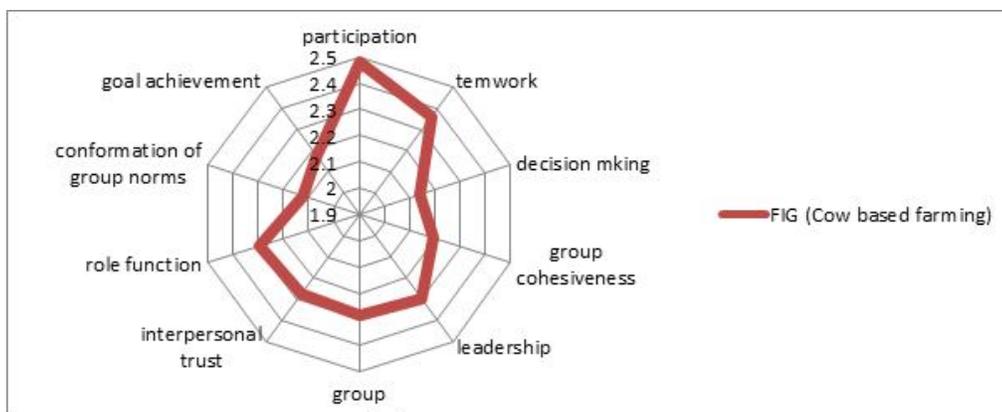


Fig 3: Comparison among dimensions of Group dynamics index of this group.

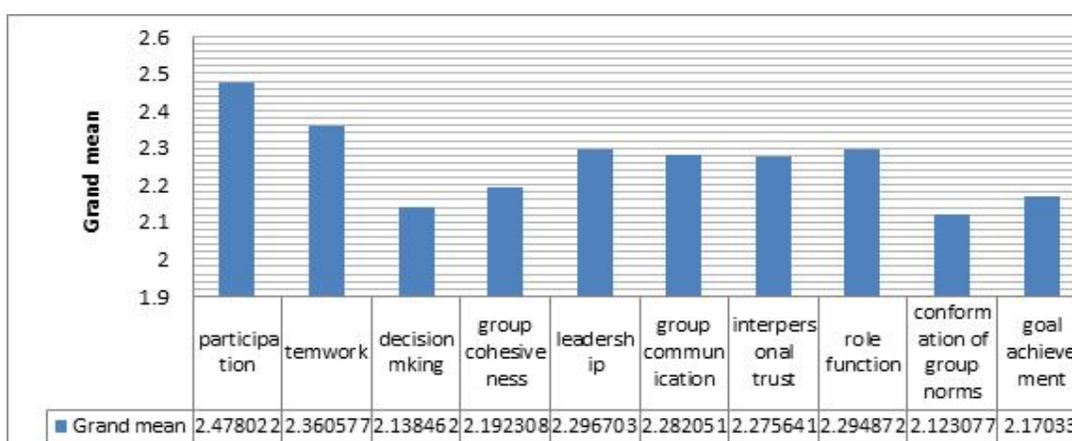


Fig 4: Group score for each dimension

**Ghana jeevamrutam(solid fertilizer)**

**Use:** It provides all macro and micro nutrient requirements of crop.

**Required inputs to prepare it for one acre:**

- Desi cow dung: 10Kg
- Desi cow urine: as per requirement
- Jaggary : 2Kg
- Green or Black gram flour: 2Kg
- Forest soil (un touched by human) : 2Kg

**Preparation:** Mix all ingredients into a thin paste and allow it to dry in shade for a week. When it gets dried-up powder it and preserves it. It can be stored up-to six months.

**Application:** Twenty kg solid fertilizer prepared, mix with fine FYM of 80 to 100Kg apply once in puddling and with 1to 2 months interval while standing crop.

**Drava jeevamrutam (liquid Fertilizer)**

**Use:** It provides all macro and micro nutrient requirements of crop. As *Ghana jeevamrutam*

**Required inputs to prepare it for one acre:**

- Desi cow dung: 10Kg
- Desi cow urine: 10-15lt
- Water: 200Lt
- Jaggary 2Kg or sugarcane juice: 4lt

Green or black gram flour: 2Kg

Forest soil (un touched by human) : 2Kg

**Preparation:** Mix all ingredients in a big drum and allow it to ferment for 4days. Every day it need to stir for 3to 4 times

**Application:** 200 lt liquid fertilizers is sufficient to serve one acre. It can be apply through irrigation, flooding, drip etc. It can be applied three times at a month interval.

Variety of pesticides prepared and used by them namely Neemastram (prepared with Neem extract, cow urine, cow dung and water), Agniasttram (prepared with Ginger, garlic, green chilli, tobacco leaf extract, cow urine, cow dung), Brahmastram (prepared from the leaves of Azadirachta indica, Annona squamosa, Ricinus communis, Pongamia Pinnata, Datura stramonium, Psidium guajava, Momordica charantia and Parthenium hysterophorus). Decoctions prepared with Aegle marmelos, and Asafoetida and fermented buttermilk used to spray for any type of diseases to control. The particulars of pesticides and fungicides and their usage are mentioned in Table 2. All major ingredients naturally available, sometimes free of cost, weeds forest tree species etc. Farmers following such practices are no need to spend more money for crop protection. According to the stage of the crop these products are applied by the group

**Table 2:** Natural pesticides & fungicides used by group members

Pesticides / Fungicides	Use
Neemastram	To control sucking pests and small insects
Agni astram	To control borers, caterpillars
Brahmastram	To control leave eating larvae
Decoction from <i>Aegle marmelos</i>	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.

Chandra and Kadian (2016)

members to avoid occurrence of the pests and diseases on paddy crop.

Farmers are very confident about these products and their success only motivating co farmers to join with them. Really there is no Brown plant hopper (BPH) incident to their field and very healthy crop stand when the researcher had direct observation of the field. Researcher further experienced the healthy crop with good number of tillers in land which is newly brought under cultivation. Farmers' care for the crop protection and crop improvement as well as their enthusiasm to share their experience was noticed by the researcher. The real success is identification of the right market for their product, farmers selling thousand rupees more per bag of rice cultivated through this natural farming. With the help of ATMA and few other sources group members have established a very good market channel and exporting their produce to nearby metropolitan cities. These farmers describes this method of farming is fetching more income at low cost of cultivation; besides it provides healthy life to the consumers since zero chemicals for production.

This kind of case studies is highly specific to the locality. There is no scientific inquiry made so far to validate

this type of practices to uplift for broad spectrum application. Agricultural professionals are no doubt completely devoid such information. Interested farmers are only practising by their adaptive trials. From this paper it is appealed to the policy makers to include subjects like organic farming, zero budget natural farming, etc into the curriculum of the agricultural sciences. This FIG is a living example of the farmers established a group by themselves and extension agency ATMA had supported it. Extension professionals have to identify such efforts by the farmers and encourage them by offering effective service by us. Farmers can try this cow based natural farming once after they visit such type of farms and get their own firsthand experience. Hope this type of farming will flourish in this ever green revolution in India to make food security to the consumers and economic security to the marginal, small and poor farmers.

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