

ORGANIC FARMING IN TAMIL NADU: A MULTIDIMENSIONAL ANALYSIS

**Topical Research submitted in part fulfillment of the requirements
for the Degree of Doctor of Philosophy in Agricultural Extension
to the Tamil Nadu Agricultural University, Coimbatore**

By

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2004

CERTIFICATE

This is to certify that the Topical Research (0+2) entitled, “ *Organic Farming in Tamil Nadu: A Multidimensional Analysis* ” submitted in part fulfillment of the requirement for the degree of Doctor of Philosophy in Agricultural Extension to the Tamil Nadu Agricultural University, Coimbatore is a record of bonafide research work carried out by **Mrs.NOORJEHAN A.K.A.HANIF, ID.No.02-804-005** under my supervision and guidance and that no part of this work has been submitted for the award of any other degree, diploma, fellowship or similar titles and that the work has not been published in part or full in any scientific or popular journal or magazine.

Place: Tiruchirapalli

Date : 09.07.2004


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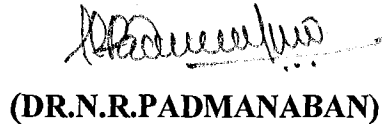
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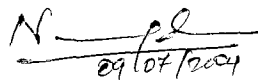
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INTRODUCTION

CHAPTER I

INTRODUCTION

The globalization of trade under World Trade Organization and opening of market to international players has thrown new challenges to farmers in general and Indian farmers in particular. Indian farmers have indeed produced the highest yield in many crops like rice, wheat, vegetables and fruits. But the quality of some of them (are reportedly) below the world market standards due to residues of various chemicals. The keeping quality of the agricultural produces also is reported to be low as a result of poor post harvest technology. To minimize this, the current option is to switch over to Organic Farming.

Scope of organic farming

The organic food market in United Kingdom has grown from 8 million in 1985 to 80 million in 1990. It was projected to be 320 million in 2000. Coffee farmers in Mexico by avoiding chemical inputs can sell their produce for 25–35 per cent higher price than non-organic produces. In India, the demand for organic produce increases year after year particularly in the international trade market. Organic produces will help us to avoid the dumping of thousand tonnes of agrochemicals every year and will give us residue free food, save environment from pollution and provide better living standards.

Channabasavanna (2003) revealed that including green manure (*Sesbania aculeata*) or green leaf manure (*Pongamia pinnata*) in rice maintained sustainability in rice yield and improved nitrogen, phosphorus and potassium status of soil.

Definition of Organic Agriculture

Organic agriculture is defined by Food and Agricultural Organisation / World Health Organisation Codex Alimentarius Commission as “a holistic production management system which promotes and enhances agro-ecosystem health including bio diversity, biological cycles and soil biological activity. It emphasizes the use of management practices in preference to the use of off farm inputs. This is accomplished

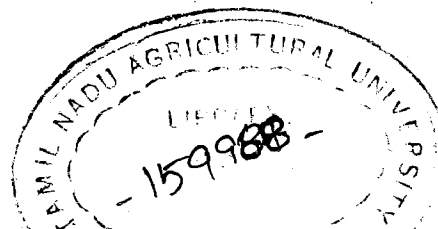
by using, where possible agronomic, biological and mechanical methods as opposed to using synthetic materials, to fulfill any specific function within the system” (Rao, 2002).

Organic Farming is growing or cultivating crops without using chemicals or chemical fertilizers and producing crops by using only naturally available materials like organic manures, green and green leaf manures, biocontrol agents (so called biopesticides) and biofertilizers *etc.* (Swaminathan, 2002).

Organic Farming practices that reduce the pressure on land, water and biodiversity without adverse effects on Agriculture production and nutritive value of food comprise, judicious use of organic manures viz., farmyard manure, compost, crop residues, vermi-compost, etc., integrated in an efficient nutrient management practice, cropping systems conjunctive use of rain, tank and underwater, integrated pest management and conservation of genetic resources. Among them, soil fertility is given top attention due to its dynamic action with various physical, chemical and biological properties (Halingali, 2003).

The State Department of Agriculture, Government of Tamil Nadu has taken up the challenge to achieve higher growth rate in agriculture by implementing several development schemes and also propagation of relevant technologies to step up the production; Organic Farming is one of the schemes. Soil health improvement through Bio-fertilizers including Green Manuring, adoption of Integrated Nutrient Management (INM) and Integrated Pest Management (IPM) technologies are given priority by the Government of Tamil Nadu to fetch better return and value addition to agricultural produce in order to improve the economic status of the farming community.

The reduction in soil fertility and the residual toxicity in some of the food crops had led to increased adoption of Organic Farming by the farmers to a considerable extent. The farmers had been practicing Organic Farming in different crops over years with reported advantages as perceived by them. However, the large-scale adoption of Organic Farming practices in various crops is still being debated at macro level. At this juncture,



the documentation of all the ongoing research efforts and findings on Organic Farming together with the scientists' views' on the feasibility Organic Farming for large-scale adoption in different crops will throw much light on Organic Farming from researchers point of view.

The extent to which Organic Farming technologies/ Practices in various crops had been transferred by the extension system to the client system and the constraints experienced in the transfer of these Organic Farming technologies will give an indication on the constraints experienced in the process. This will also suggest the scope and the possibilities of the transfer of selected and profitable Organic Farming technologies among the farmers.

The indigenous and improved Organic Farming practices in different field crops and the reported merits/disadvantages as perceived by the farmers in comparison to inorganic farming will serve as a ready reckoner to promote Organic Farming.

Keeping the above in view, a study was conducted in Tiruchirapalli district in the Cauvery Delta Zone of Tamil Nadu with the following specific objectives:

1. To study the awareness, knowledge and adoption of Organic Farming related to production and protection of major field crops.
2. To enlist the advantages and constraints in the adoption of Organic Farming as perceived by the farmers.
3. To assess the training needs of farmers practicing Organic Farming.
4. To list out the farmers' suggestions to overcome the constraints in the adoption of Organic Farming.

Scope of the study

The study would give a thorough understanding of the farmers' awareness, knowledge and adoption of organic farming practices in major wetland crops such as paddy and sugarcane.

The study will also reveal the major advantages and constraints involved in the adoption of organic farming practices, which in turn will help the researchers to formulate suitable package of practices to extend the organic farming practices to a large extent.

In addition, it will help the extension personnel to frame suitable training strategies to help the farmers adopt the organic farming practices in an amicable manner.

Limitations of the study

The limitations such as time, limited resources and conveyance facilities were met during the course of investigation by the student researcher. Yet, sincere efforts were made to make this study as an objective, definite and systematic one to the extent possible.

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

An attempt was made to review the literature related to the present study. Based on the objectives finalized for the study, the review is presented under the following subheads.

- 2.1. Importance and advantages of Organic Farming
- 2.2. Awareness level of farmers on Organic Farming
- 2.3. Knowledge level of farmers on Organic Farming
- 2.4. Adoption level of farmers on Organic Farming
- 2.5. Training needs of farmers on Organic Farming
- 2.6. Constraints faced in the adoption of Organic Farming
- 2.7. Suggestions offered by the farmers to overcome the constraints

2.1. Importance and advantages of Organic Farming

Botiono and Mokwunye (1991) reported that the fertilizer use efficiency increased dramatically when combined with the crop residues and manures.

Singh and Dixit (1994) while discussing the planning aspects to increase the biofertilizer usage stated that the users of biofertilizers in Tamil Nadu were benefited with increased yields and additional profits.

Frietas (1995) opined that both large and small farmers who did not conserve the soil will lose their soil within 20 years time. Only those who use organic fertilization and who have some ecological and environmental awareness could conserve their farm soil.

Venkataramani (1995) reported that ecological farming was more labour intensive and several of its components such as vermicomposting, vermiwash, botanical pesticides and rearing beneficial insects such as *Trichogramma* parasites, lady bird beetles and spiders for release in the fields as bio-control agents offer scope for unemployed and landless youth.

2.2. Awareness level of farmers on Organic Farming

According to Reijntjes (1995) many farmers were aware and interested in specific techniques such as use of green manures and biopesticides, which increased the profit from rupees 3000 to 6000 per acre.

Venkataramani (1995) observed an increased awareness among farmers about environmental hazards and other related insect resistance and resurgence problems. This gave a new significance to the efficiency of plant-derived products in crop protection.

According to Sriram (1997) who reported that majority of the respondents (59.16 per cent) had medium level of awareness followed by high (25.84 per cent) and low levels (18.00 per cent) regarding eco-friendly cultivation practices.

Alagesan and Sumathi (1998) found that awareness was more for *Azospirillum* in the case of bio-fertilizers; *Trichoderma* was well known only by a few in the case of parasites and predators.

Parthasarathi and Govind (2001&2002) reported that trained farmers had 86.67 per cent and untrained farmers had 53.33 per cent of knowledge on use of neem-based insecticides in rice crop. The use of NPV was to the tune of 83.33 and 13.33 per cent respectively among trained and untrained farmers.

2.3. Knowledge level of farmers on Organic Farming

Snehalatha (1991) found that 62.50 per cent of the farmers had knowledge about summer ploughing and *Azospirillum* usage while setting up of light traps for leafhoppers was known to 75.00 per cent of the respondents.

Nirmala *et al.*, (1995) reported that nearly half (42.83 per cent) of the farmers were found to possess a high level of knowledge on bio-fertilizers followed by medium (32.50 per cent) and low (24.67 per cent) knowledge levels.

Jeyaraj (1997) revealed that majority (66.67 per cent) of the farmers possessed low to medium level of knowledge on biopesticides.

Varghese (1998) reported that 38.33 per cent of the respondents possessed medium level of knowledge on the selected eco-friendly technologies, followed by 32.50 per cent with high knowledge level and 29.17 per cent with low level of knowledge.

Alagesan (1999) concluded that about two-thirds of the respondents had knowledge about *Azospirillum*, followed by *Rhizobium*, which was a little less than half. Farmers had limited knowledge on parasites and predators.

Noorjehan (1999) revealed that majority of the respondents (90.00 per cent) had low to medium level of knowledge on pest management practices, 58.00 per cent of which fell under medium level category.

Maheswari (2000) reported that there existed a high level of knowledge about the organic farming practices among vegetable growers. She also found that knowledge level of small farmers was significantly more than that of marginal and big farmers on organic farming practices.

Shiraj (2001) reported that about half of the respondents possessed high knowledge level (45.83 per cent) of eco-friendly cultivation practices. More than 37.50 per cent possessed medium level knowledge while only 16.67 per cent had low level of knowledge.

2.4. Adoption level of farmers on Organic Farming

Muthuraman (1995) reported that the of adoption of farmyard manure was graded into three categories based on the quantum of its application vis-a-vis the recommended quantity. Nearly 40.00 per cent of the farmers were medium adopters and about 30.00 per cent of farmers belonged to each of the other two, low and high categories. In the case of green manuring to paddy, 84.00 per cent of the farmers were in low to medium adopter categories and only 16.00 per cent of the farmers were in the high adopter category.

Majority of the respondents (60.83 per cent) had low level of adoption of bio pesticides as reported by Jeyaraj (1997).

Sriram (1997) revealed that 39.16 per cent of the respondents had medium level of adoption of eco-friendly cultivation practices followed by high levels of adoption (35.84 per cent).

Noorjehan (1999) found that among the rice farmers, 72.00 per cent had medium to high level of adoption with 38.00 per cent under medium adoption level category.

Maheshwari (2000) pointed out that majority of the respondents (59.17 per cent) had medium level of adoption followed by low level of adoption (33.33 per cent). High

level of adoption was found among 7.50 per cent of the respondents only. She also found that the marginal farmers showed high level of adoption (30.00 per cent), closely followed by small farmers (27.50 per cent). Only 12.50 per cent of the big farmers adopted the organic farming practices.

Shiraj (2001) stated that majority of the respondents (60.00 per cent) were medium level adopters. Low level of adoption was found among 29.16 per cent of the respondents. Only 10.83 per cent of the respondents had a high level of adoption.

Ranganatha *et al.*, (2001) revealed that nearly half of the small farmers (49.00 per cent) were medium adopters, while 30 per cent and 21 per cent of them were low and high adopters of organic farming practices in rice cultivation. They also found that only six characteristics *viz.*, education, use of mass media, extension participation, innovation proneness, scientific orientation and risk orientation had shown significant relationship with the adoption level.

Ramesh and Govind (2001&2002) found that among the Organic Farming practices, the mean per cent of adoption was highest for water management (89.00 per cent), followed by land preparation (85.50 per cent), storage (82.25 per cent), nutrient management (82.16 per cent), seed and sowing (74.75 per cent), weed management (74.50 per cent) and plant protection (73.28 per cent). They also reported that the following practices recorded higher per cent of adoption *viz.*, *insitu* incorporation of crop residue (98.00 per cent), application of neem cake/castor oil cake (96.00 per cent), application of green leaf manure (95.00 per cent), application of farmyard manure (90.00 per cent), raising green manure and incorporation (86.00 per cent), seed treatment with *Azospirillum* (80.00 per cent), application of compost (80.00 per cent), application of *Azospirillum* (70.00 per cent), application of vermicompost (62.00 per cent) and cattle / sheep penning (60.00 per cent).

2.5. Training needs of farmers on Organic Farming

2.5.1. Importance of training

Sundararajan (1985) defined training as a process whereby change is brought about in the knowledge, skill and attitude of the learners in their jobs, which would lead to efficient execution of the job performed.

Tantray (1989) viewed the training of farmers and extension functionaries as a critical input for the rapid transfer of agricultural technology and a way to modernize the important sector of the country.

2.5.2. Subject matter

Alagesan (1990) stated that mango growers needed training mostly in plant protection (98.33 per cent) followed by pruning (70.00 per cent) and manures and manuring (56.67 per cent).

Khurana and Satvinderkaur (1996) revealed that while planning any training programme, more emphasis should be laid on plant protection measures, marketing and machinery and equipment.

Maheswari (2000) found that the vegetable growers had more need about the use of biocontrol agents, biopesticides, vermicompost, coirpith compost, biogas slurry, sugarcane trash compost, enriched farmyard manure and biofertilizers.

2.5.3. Type of training

Thangachamy (1993) reported that institutional type of training was preferred by most (85.00 per cent) of the farmers.

Venkatesan (1997) found that most of the respondents preferred institutional training (95.83 per cent), followed by peripatetic training (73.33 per cent).

Maheswari (2000) found that more than 60.00 per cent of the respondents preferred peripatetic training.

2.5.4. Venue of training

Rose (1991) stated that among chilli growers, small farmers (70.00 per cent) preferred local school as the suitable venue whereas the big farmers (50.00 per cent) preferred Agricultural College campus as the suitable venue for conducting training programmes.

Venkatesan (1997) reported that majority of the respondents (83.33 per cent) preferred Panchayat Union Office as the suitable venue for conducting training programmes.

Maheswari (2000) found that the respondents preferred local school as the venue for training.

2.5.5. Duration of training

Alagesan (1990) reported that 43.33 per cent of the mango growers expressed the need for two days training, while about one-third (31.67 per cent) opted for one day training.

Perumal (1994) revealed that 97.50 per cent of the Tamil Nadu Women in Agriculture (TANWA) trainers were satisfied with trainings of five days duration.

Maheswari (2000) reported that training of three days was preferred by 63.33 per cent of the vegetable growers followed by 62.50 per cent of the respondents who preferred full day training.

2.5.6. Season of training

Sekar *et al.*, (1990) stated that majority of the big (65.00 per cent) and small (77.50 per cent) farmers preferred training in the month of February – March.

Venkatesan (1997) reported that most of the respondents preferred training conducted during kharif season (69.17 per cent). Pre-season training was preferred by 20.00 per cent of respondents.

Maheswari (2000) inferred that 76.67 per cent of the respondents preferred summer season for training.

2.5.7. Training method

Raji (1991) found that demonstrations, video cassettes, group discussions and field trips were the training methods preferred by the farmers in the order of importance.

Perumal (1994) found that 96.67 per cent of the respondents preferred tour as the best training method.

According to Maheswari (2000), most of the respondents (93.25 per cent) preferred lecture method of training followed by demonstrations (92.70 per cent) and field visits (88.00 per cent).

2.5.8. Trainers

Thangachamy (1993) stated that extension personnel and scientists were the most preferred trainers.

Seethalakshmi (1999) inferred that majority of the respondents preferred Agricultural officers in the State Department of the Agriculture as the trainers to impart the needed training.

Maheswari (2000) revealed that little less than half of the vegetable growers (48.33 per cent) preferred scientists as trainers.

2.6. Constraints faced in the adoption of Organic Farming

Radhakrishnan *et.al* (1993) identified lack of awareness, un-availability of inputs, lack of skill, lack of credit and non-suitability of land in green manure cultivation as constraints.

Reddy and Chandrasekar (1994) reported that some of the initial barriers that may prevent some of the farmers to adopt organic farming are a) land resources could move freely from organic farming to conventional farming, which did not move freely in the reverse direction, b) in changing over to organic farming an initial crop loss generally occurred particularly when done quickly, c) biological controls that had been weakened or destroyed by chemicals would take three or four years for residues to loose their effect.

Santhakumar (1995) reported that there was not relative advantage in using organic manures when chemical fertilizers were supplied at heavily subsidized rate.

Sriram (1997) reported that a vast majority of the respondents (92.50 per cent) ranked labor scarcity as the first and foremost constraint while following eco-friendly agricultural practices, followed by lack of assured irrigation (87.50 per cent) and the lack of technical guidance on the use and application of bio-control agents (56.66 per cent).

Shiraj (2001) stated that labour scarcity was regarded as the most pressing constraint. Inability to attend the training was regarded as the major communication constraint. Among personal constraints, the inability to identify bio-agents was ranked first followed by the difficulty in the use of organic manures. High cost of labour was considered as the major constraint in the socio-economic category. Among the technical constraints, increased time and labour that was demanded by the eco-friendly cultivation practices was ranked first.

Ranganatha *et al.*, (2001) observed that more cost and risk involvement in getting organic manure, (vermicompost, neem cake/castor oil cakes, *etc.*), transportation of green manure, lack of ready packages for growing rice organically and lack of knowledge on crop rotation, water management and a few complete organic farming practices (integrated nutrient management and biological control of pests and diseases) were the major constraints faced by 60 per cent of the small farmers to practice organic farming in rice. Most of the small farmers (81 per cent) perceived that organic farming is a slow process. About half of the small farmers (46.00 per cent) mentioned that the training programmes conducted by the extension workers were at far off places.

Bairathi *et al.* (2002) disclosed that the most important constraint perceived by the trainees in adoption of organic farming was 'short life of bio-cultures' which was ranked by 95.00 per cent of the respondents followed by non-availability of culture in time and non-availability of seed / variety resistant to diseases / insects/ nematodes (90.00 per cent each) and 75.00 per cent of the trainees perceived socio-economic problems of adopting organic farming.

2.7. Suggestions offered by the farmers to overcome the constraints

Iqbal *et al.*, (1995&1996) suggested that the farmers need to be motivated to adopt all the technologies of Integrated Pest Management in cotton crop by organising field trips to research stations in addition to discussion, seminars, farmers day and /or field day.

Karthikeyan *et al.*, (1995&1996) revealed that timely payment for the produce, higher price per ton produce, introduction of pest resistant varieties, provision of adequate knowledge on sugarcane cultivation, early planting, quick loading, unloading and proper regulation of cutting orders were some of the suggestions given by the sugarcane growers.

In the study of Alli (1997), the suggestions offered by the mango growers to overcome the problems were in the order of need for more technical guidance (78.18 per cent), proper guidance in chemical pesticides and micro nutrients usage (64.55 per cent), regular visit by the field staff (49.09 per cent), the rate of subsidy should be increased (48.18 per cent) and proper guidance in getting loans (39.09 per cent).

Parasuraman (1997) enlisted the following as the suggestions offered by the paddy seed growers for enhanced participation in Seed Multiplication Scheme.

- Enhance procurement rates and quick payment of money (85.00 per cent)
- Construction of threshing floors in villages (82.00 per cent)
- Giving subsidy to transport of seeds (76.00 per cent)

Mathaiya (1997) reported that the suggestions given by the mango growers to overcome the problems were evolving pest and disease resistant varieties (91.67 per cent), price stabilisation by information fair price through mass media (80.00 per cent), providing adequate extension services by the Department of Horticulture (65.83 per cent) and provision of subsidy for different agricultural inputs (63.33 per cent).

**RESEARCH
METHODOLOGY**

CHAPTER III

RESEARCH METHODOLOGY

This chapter deals with the research methodology used in the study under the following heads.

3.1 Locale of research

3.2 Sample and sampling procedure

3.3 Selection, operationalisation and measurement of variables

3.4 Method of data collection

3.5 Statistical tools used

3.1 Locale of Research

3.1.1. Selection of the District

Tiruchirapalli, which is a centrally and ideally located district in the State of Tamil Nadu, has all the field crops, horticultural crops and hill crops grown. With the recent popularization of the Organic Farming concepts largely by the State Extension Machinery and also to a considerable extent by the Tamil Nadu Agricultural University, the farmers in the district have slowly started switching over to judicial Organic Farming. Series of seminars, workshops, conferences and interaction sessions amongst the Farm Scientists, Extension Personnel and also the farmers had taken place largely spread over in Tiruchirapalli district. In addition to these research efforts also taken up in areas like vermicompost, coirpith compost, sugarcane mulch usage etc.

The student researcher's placement at Tiruchirapalli district and familiarity with the cultural practices prevailing in the district were the other causes for choosing Tiruchirapalli district purposively for the study.

3.1.2. Selection of Division

Lalgudi agricultural division of Tiruchirapalli district was purposively selected wherein most of the major field crops are cultivated compared to other divisions (Table 1).

Table 1. Area under major field crops in Tiruchirapalli district

S.No.	Crops	Agricultural Division wise area (ha)					Total (ha)
		Tiruchy	Manapparai	Musiri	Thuraiyur	Lalgudi	
1.	Paddy	20500	6000	7250	11250	25000	70000
2.	Millets	330	13965	24845	9475	19585	68200
3.	Pulses	7395	4125	4860	2905	10715	30000
4.	Sugarcane	480	275	525	520	3500	5300
5.	Cotton	515	2220	300	600	4580	8215
6.	Oilseeds	865	11520	11650	5780	7675	37490
	Total	30085	38105	49430	30530	71055	219205

Source: Office of the Joint Director of Agriculture, Tiruchirapalli District (2003)

3.1.3. Selection of Block

Lalgudi Agricultural Division consists of three blocks from which Lalgudi block was selected for the reason of higher acreage under paddy and sugarcane (in which organic farming practices were reportedly high than other blocks (Table 2).

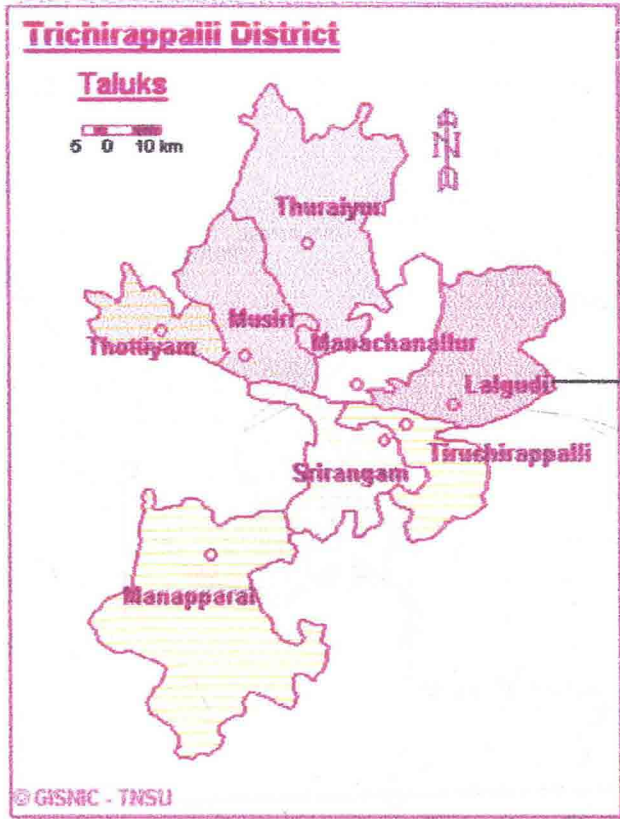
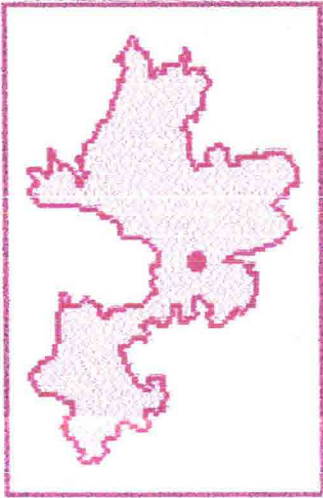
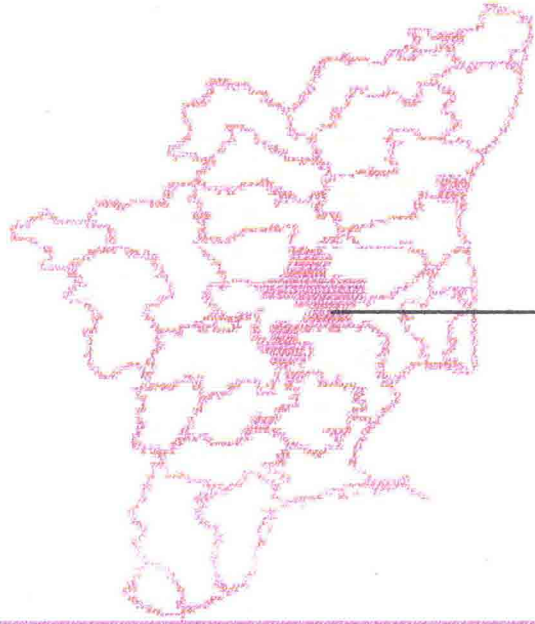
Table 2. Block wise area under major field crops in Lalgudi Agricultural Division

S.No.	Crops	Block - wise area (ha)			Total (ha)
		Lalgudi	Pullambadi	Manachanallur	
1.	Paddy	13900	6200	4900	25000
2.	Millets	115	6800	12670	19585
3.	Pulses	4360	2975	3380	10715
4.	Sugarcane	2300	800	400	3500
5.	Cotton	0	3080	1500	4580
6.	Oilseeds	2675	1765	3215	7675

Source: Office of the Joint Director of Agriculture, Tiruchirapalli District (2003)

TAMIL NADU

TIRUCHIRAPALLI DISTRICT

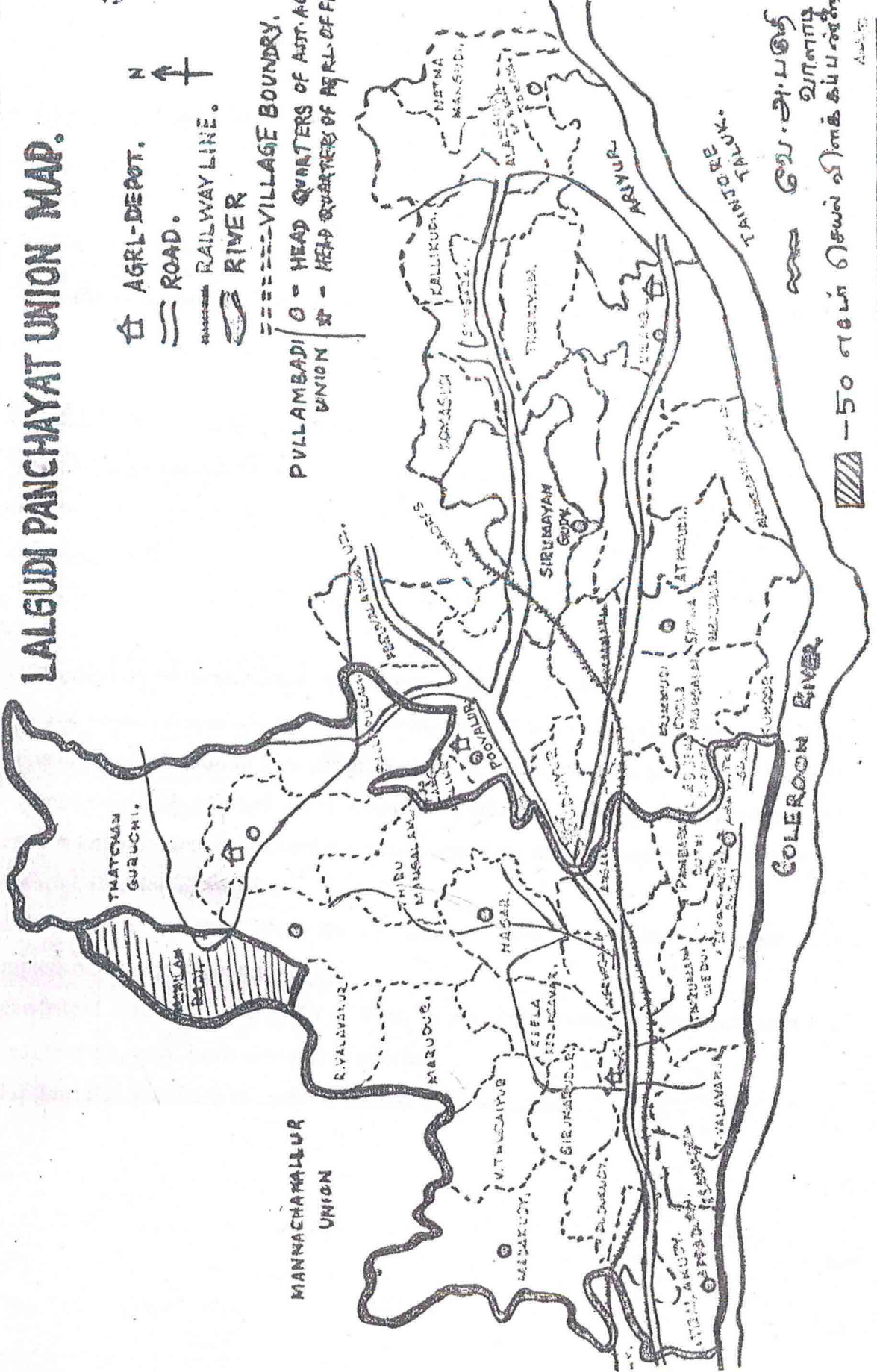


Selected Block

LALGUDI PANCHAYAT UNION MAP.

- ⚡ AGRIL-DEPOT. N ↑
- == ROAD.
- ⚡ RAILWAY LINE.
- 🌊 RIVER
- VILLAGE BOUNDRY.

PVLLAMBADI ○ - HEAD QUARTERS OF AGRIL. AG
 UNION ☆ - HEAD QUARTERS OF AGRIL. OF FICER.



50 மீட்டர்
 50 மீட்டர்
 50 மீட்டர்

3.1.4. Selection of villages

Lalgudi block has been administratively divided into 53 revenue villages. Of them, six villages were randomly selected based on the fact that organic farming practices were followed predominantly for paddy and sugarcane. The villages selected were Poovalur, Sirumayamgudi and Mettupatti for Sugarcane crop and Keelaperungavur, Melaperungavur and Valadi for Paddy crop.

3.1.5. Selection of crops

Paddy and sugarcane were the major wetland crops grown in Tiruchirapalli district and hence these were chosen for the study.

3.2. Sample and sampling procedure

Keeping in mind, the time factor to be involved for the study, it was decided to draw a sample of 60 respondents from the universe, viz., the farmers growing paddy and sugarcane, a sample of 30 from each crop. The farmers were selected randomly. Within the sample size two case studies each for paddy and sugarcane were also collected.

3.3. Selection, operationalisation and measurement of variables

The variables were selected by reviewing the past literature and discussion with the experts in the office of Joint Director of Agriculture, Tiruchirapalli and Assistant Director of Agriculture, Lalgudi and other extension personnel. The operationalisation and measurement procedure of selected items included in the study are summarized below.

Operationalisation of variables

Awareness: It is the stage where the individual is exposed to the innovation but lacks complete information about it.

Knowledge: It refers to collection of facts, values, information etc. to which man has access through study, institution (or) experience.

Adoption: It is a decision to continue full use of an innovation.

Training: It is the process of aiding an individual to gain effectiveness in his present or future work through the development of appropriate habits of thought and action, skill, knowledge and attitude.

3.4.Method of data collection

Data collection was done with the help of a well structured and pre- tested interview schedule. The data were collected during June 2004.

3.5.Statistical tools used

Simple percentage analysis and cumulative frequency were used in this study to draw meaningful inferences.

***FINDINGS AND
DISCUSSION***

CHAPTER IV

FINDINGS AND DISCUSSION

The findings of the study along with discussion are summarized under the following subheads in this chapter.

- 4.1. Profile characteristics of the respondents
- 4.2. Awareness and Adoption level of Organic Farming practices
- 4.3. Knowledge level of Organic Farming practices
- 4.4. Advantages and constraints in the adoption of Organic Farming practices
- 4.5. Training needs of farmers practicing Organic Farming
- 4.6. Suggestions to overcome the constraints in the adoption of Organic Farming

4.1. Profile characteristics of the respondents

A thorough insight of the characteristics of the respondents would help to arrive at meaningful interpretations and conclusions. In the present study, seven characteristics of the respondents were taken. The findings for paddy and sugarcane growers are presented according to the characters studied.

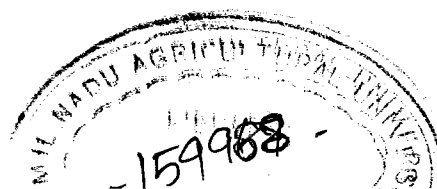
4.1.1. Age

Age was operationalised as the number of completed years of the respondents at the time of enquiry and the chronological age was taken a measure. Based on the data collected, the respondents were classified into young, middle and old age categories following the procedure adopted by Gnanadeepa (1991) and Somasundaram (1995) and presented in table 3.

Table 3. Distribution of respondents according to their age

(n=60)

S.No.	Categories	Number	Percentage
1.	Young (less than 35 years)	10	16.67
2.	Middle (35 to 45 years)	15	25.00
3.	Old (More than 45 years)	35	58.33
	Total	60	100.00



The table 3 revealed that more than half (58.33 per cent) of the respondents were in the old age category with maximum age of 65 years among the contacted farmers followed by 25.00 per cent in the middle age category and 16.67 per cent were under young category. This table reflects that majority of the aged and experienced farmers take up Organic Farming.

4.1.2. Educational status

Educational status of an individual is considered as one of the influencing factors for knowledge gain and adoption as it influences farmers' understandability. The data collected from illiteracy to college level are presented in table 4.

Table 4. Distribution of respondents according to their educational status

(n=60)

S.No.	Categories	Number	Percentage
1.	Illiterates	--	--
2.	Functionally literates	--	--
3.	Primary education	13	21.67
4.	Middle education	15	25.00
5.	Secondary education	27	45.00
6.	Collegiates	5	8.33
	Total	60	100.00

It could be seen from the table 4 that all the respondents surveyed were literates. A little less than half of them (45.00 per cent) had secondary education. About 46.67 per cent of the respondents had primary to middle school education while a meagre per cent of 8.33 were collegiates.

4.1.3. Occupational status

Occupational status indicates the extent of involvement of an individual in his farm operations. The findings of the study are presented in table 5.

Table 5. Distribution of respondents according to their occupational status
(n=60)

S.No.	Categories	Number	Percentage
1.	Agriculture as primary occupation	55	91.67
2.	Agriculture as secondary occupation	5	8.33
	Total	60	100.00

It could be inferred from the table 5 that a vast majority of the respondents (91.67 per cent) had agriculture as their prime occupation while less than one-tenth (8.33 per cent) of the respondents were engaged in other activities like teaching, business, labourers in Kothari Fertilizers Private Ltd. etc. along with agriculture.

The farmers with agriculture as their prime occupation could spend more time in getting information on Organic Farming than others.

4.1.4. Farming experience

Experience in farming acquired over a period of years definitely helps in making rational decisions in the acceptance and adoption of Organic Farming practices. The data collected in this aspect are presented in table 6 and categorised into low, medium and high following the procedure adopted by Mathaiya (1997).

Table 6. Distribution of respondents according to their farming experience
(n=60)

S.No.	Categories	Number	Percentage
1.	Low (upto 10 years)	6	10.00
2.	Medium (11 to 24 years)	14	23.33
3.	High (more than 24 years)	40	66.67
	Total	60	100.00

It is clear from the table 6 that two-third of the respondents (66.67 per cent) belonged to high farming experience followed by medium farming experience to the tune of 23.33 per cent. Lower farming experience of 10.00 per cent was recorded which might be due to young age farmers.

4.1.5. Farm size

The farm size of an individual represents the extent of farming and also considered as an essential factor influencing knowledge and adoption. The procedure adopted by Venugopalaireddy (1992) was followed to categorise the farm holdings and the collected data are presented in table 7.

Table 7. Distribution of respondents according to their farm size

(n=60)

S.No.	Categories	Number	Percentage
1.	Holdings upto 5 acres	36	60.00
2.	Holdings above 5 acres & upto 10 acres	22	36.67
3.	Holdings above 10 acres	2	3.33
	Total	60	100.00

The table 7 clearly depicts that 60.00 per cent of the farmers possessed land holdings less than 5 acres followed by 36.67 per cent of the respondents possessing land size between 5 and 10 acres while only two farmers (3.33 per cent) were big landlords having acreage of 20 acres.

4.1.6. Social participation

Participation in formal and non-formal organisations paves way for more interactions among different sections of the society. This in turn helps to gain more knowledge thereby improving their profession. To know the existing trend in this factor, data were collected and presented in table 8.

Table 8. Distribution of respondents according to their social participation
(n=60)

S.No.	Categories	Number	Percentage
1.	No membership	1	1.67
2.	Membership in one organisation	45	75.00
3.	Membership in more than one organisation	9	15.00
4.	Office bearer in one organisation	5	8.33
5.	Office bearer in more than one organisation	--	--
	Total	60	100.00

The table 8 reveals that a vast majority of the respondents had good social participation as 75.00 per cent of the respondents were members in one organisation (i.e. Cooperative Bank) and 15.00 per cent were members in more than one organisation (self-help group) while 8.33 per cent were acting as office bearers in Panchayat Union, self-help group etc.

4.1.7. Sources of information

This variable reflects one's exposure to different mass media both cosmopolite and localite channels. More the exposure to mass media higher would be the knowledge gain. The data collected are presented in table 9.

Table 9. Distribution of respondents according to their sources of information**(n=60)**

S.No.	Categories	Number	Percentage
1.	Individual contact methods		
	i) Fellow farmers	60	100.00
	ii) Friends	55	91.67
	iii) Relatives	50	83.33
	iv) Neighbours	55	91.67
	v) Village leaders	35	58.33
	vi) Research scientists	10	16.67
	vii) Dept.of Agriculture Officials	56	93.33
	viii) Dealers / Seed agency	60	100.00
2.	Group contact methods		
	i) Adaptive trials	50	83.33
	ii) Demonstrations	50	83.33
3.	Mass contact methods		
	i) Radio	60	100.00
	ii) Television	35	58.33
	iii) Newspapers	60	100.00
	iv) Magazines	45	75.00
	v) Exhibition	50	83.33
	Total	60	100.00*

(*: Due to multiple responses, the actual total will exceed 100.00)

Among the sources of information, the respondents' preferred individual contact methods followed by group contact methods and mass contact methods. Within the individual contact methods, the respondents preferred fellow farmers (100.00 per cent), dealers/seed agency (100.00 per cent), Agricultural department officials (93.33 per cent), and friends and relatives (91.67 per cent each). The group contact methods say adaptive trials and demonstrations were preferred by 83.33 per cent of the respondents in each category. In mass contact methods, radio and newspaper were preferred to the most

(100.00 per cent each) followed by exhibition (83.33 per cent), magazines (75.00 per cent) and television (58.33 per cent).

The accessibility and amenability to research scientists should be increased and more of television programmes should be telecast on agriculture.

4.2. Awareness and Adoption level of Organic Farming practices

To adopt any practice, awareness about that practice becomes essential. The adoption rate of individual is influenced by one's psycho-personal factors and surrounding socio-cultural and economic factors.

The awareness and adoption of Organic Farming practices for paddy and sugarcane have been discussed under sub heads.

4.2.1. Awareness and Adoption level of Organic Farming practices in Paddy

The overall and practice wise awareness and adoption levels of Organic Farming practices in paddy were discussed below.

4.2.1.1. Overall Awareness level of Organic Farming practices in Paddy

Using cumulative frequency method, the respondents were classified into low, medium and high awareness level categories and the findings are furnished in table 10.

Table 10. Distribution of respondents according to their Overall Awareness level of Organic Farming practices in Paddy

(n=30)

S.No.	Categories	Number	Percentage
1.	Low (less than 7 score)	--	--
2.	Medium (score of 7 to 14)	--	--
3.	High (more than score of 14)	30	100.00
	Total	30	100.00

It could be inferred from the table 10 that the overall awareness level was found to be very high (100.00 per cent). It might be due to the fact that farmers followed organic farming practices traditionally. [Fig. 1]

Table 11. Distribution of respondents according to their awareness and adoption level of Organic Farming Practices in Paddy (n=30)

S.No.	Organic Farming Practices	Awareness		Adoption	
		Number	Percentage	Number	Percentage
I	Soil fertility management				
a)	Organic manures				
1.	Application of Farm yard manure (FYM)	30	100.00	30	100.00
2.	Application of Biogas slurry	25	83.33	3	10.00
3.	Application of green manures	30	100.00	30	100.00
4.	Application of green leaf manures	30	100.00	30	100.00
5.	Application of goat & duck droppings	30	100.00	16	53.33
6.	Application of cured poultry manures	30	100.00	9	30.00
b)	Composts				
7.	Application of Vermicompost	30	100.00	7	23.33
8.	Application of Coir pith compost	30	100.00	10	33.33
9.	Application of Weed compost	30	100.00	30	100.00
c)	Bio fertilizers				
10.	Growing of <i>Azolla</i> as a dual crop	11	36.67	--	--
11.	Application of Blue Green Algae	11	36.67	--	--
12.	Application of <i>Azospirillum</i>	30	100.00	30	100.00
13.	Application of <i>Phosphobacteria</i>	30	100.00	30	100.00
14.	Application of <i>Pseudomonas florescens</i>	16	53.33	10	33.33
d)	Other wastes as manures				
15.	Application of sewage waste	30	100.00	3	10.00
16.	Application of Pressmud	30	100.00	2	6.67
17.	Application of Bone meal / fish meal	30	100.00	--	--
18.	Application of neem/castor oil cakes	30	100.00	7	23.33
19.	Application of spent wash	20	66.67	--	--
II	Pest & Disease Management				
e)	Biopesticides				
20.	Application of Neem oil 3%	30	100.00	30	100.00
21.	Application of Neem seed kernel extract 5%	30	100.00	30	100.00
22.	Application of Illuppai oil 6%	30	100.00	8	26.67
23.	Application of <i>Prosopis</i> leaf extract	30	100.00	8	26.67
24.	Application of <i>Ipomea</i> leaf extract	30	100.00	8	26.67
25.	Application of Notchi leaf powder extract	30	100.00	8	26.67
f)	Bio control agents				
26.	Release of <i>Trichogramma japonicum</i>	28	93.33	13	43.33
27.	Release of <i>Trichogramma chilonis</i>	25	83.33	2	6.67
28.	Release of <i>Platygaster oryzae</i>	25	83.33	1	3.33
g)	Others				
29.	Panchakavya (a biofertilizer)	30	100.00	3	10.00
30.	Matka (a biopesticide)	30	100.00	3	10.00

4.2.1.2. Practice wise Awareness level of Organic Farming practices in Paddy

From the table 11, it could be inferred that the respondents had cent per cent of awareness on biopesticides, composts and farmer innovations like Panchakavya and Matka. Cent per cent awareness was noticed for application of farmyard manure, green manures, green leaf manures, goat & duck droppings, cured poultry manure, *Azospirillum* & *Phosphobacteria*, sewage waste, pressmud, bone meal/fish meal and neem cake/castor oil cakes. The reason might be the availability of all these at village level, extensive publicity and awareness campaigns for vermicompost, coirpith compost and weed compost etc.

Similar findings were found by Alagesan and Sumathi (1998) & Parthasarathi and Govind (2001&2002).

The higher awareness level might be due to the fact that these practices were well known to all the farmers from their forefathers and also through awareness campaigns conducted by the Government / Department of Agriculture and Tamil Nadu Agricultural University. Higher level of education is also a contributing factor.

Awareness on release of *Trichogramma japonicum*, *Trichogramma chilonis* *Platygaster oryzae* and application of biogas slurry were to the tune of 93.33, 83.33, 83.33 and 83.33 per cent respectively. The poor interest on part of the respondents for the application of biocontrol agents and absence of biogas plant in the village might be the reason.

Awareness on application of spent wash, *Pseudomonas fluorescens*, Blue Green Algae and growing of *Azolla* were in the per cent of 66.67, 53.33, 36.67 and 36.67 respectively. The reason might be that these were not at all practiced in the study area. Lower awareness of 20.00 per cent was found for application of spent wash since it is used for reclaiming alkaline soils that is not prevailing in the study area.

Fig.1.Overall Awareness,Knowledge and Adoption of Organic Farming in Paddy

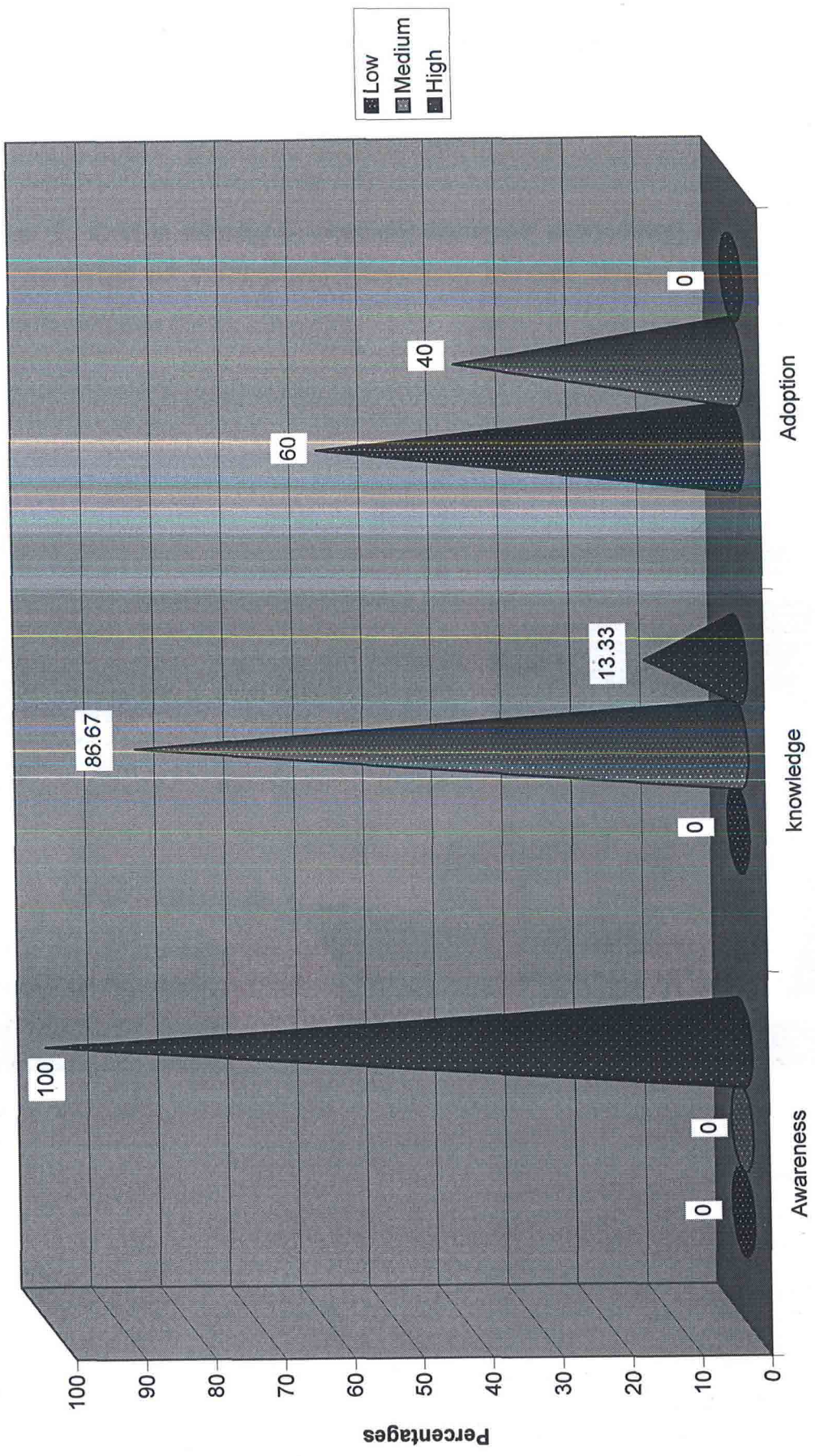


Photo 1. Case study I -Paddy farmer showing the heaped method of vermicomposting under thatched roof



**Photo 2. Farmers' innovation – Panchakavya
(a biofertilizer) under preparation**



**Photo 3. Farmers' innovation – Matka (a biopesticide)
under preparation**



4.2.1.3. Overall Adoption level of Organic Farming practices in Paddy

Using cumulative frequency method, the respondents were classified into low, medium and high awareness level categories and the findings are furnished in table 12.

Table 12. Distribution of respondents according to their Overall Adoption level of Organic Farming practices in Paddy

(n=30)

S.No.	Categories	Number	Percentage
1.	Low (less than 14 score)	18	60.00
2.	Medium (score of 14 to 28.2)	12	40.00
3.	High (more than score of 28.2)	--	--
	Total	30	100.00

It could be inferred from the table 12 that the overall adoption level was found to be low (60.00 per cent) and medium adoption level of 40.00 per cent. The low to medium level of adoption is due to the reason that the farmers preferred good crop stand and higher net profits for their investment and that could be achieved by using inorganic way of farming. [Fig. 1]

The findings are in similar line with the findings of Jeyaraj (1997).

4.2.1.4. Practice wise Adoption level of Organic Farming practices in Paddy

The respondents showed cent per cent adoption for the practices viz., application of farmyard manure, green manures, green leaf manures, weed compost, *Azospirillum* & *Phosphobacteria*, neem oil 3% and neem seed kernel extract 5%. This was reported due to its familiarity and easy approach. Easy availability and traditional medicinal nature of neem and neem products at village level was another reason. (Refer table 11)

The findings are more or less in coincidence of the findings of Ramesh and Govind (2001&2002).

The practices such as application of goat and duck droppings and release of *Trichogramma japonicum* were recorded 53.33 and 43.33 per cent respectively. Due to the bulkiness and time consuming process in the preparation of coirpith compost lower

adoption of 33.33 per cent was recorded. The adoption of application of *Pseudomonas fluorescens* was 33.33 per cent only due to the relatively lesser observability of this innovation and also non-availability of *Pseudomonas fluorescens* in large quantities at their village level.

The cured poultry manures was adopted to the tune of 30.00 per cent might be because of the loitering habit of the poultry birds, exclusive collection may not be possible. Time, money and energy cost involved in the preparation of biopesticides (except neem oil and neem seed kernel extract), led to its adoption to the tune of 26.67 per cent only. Hence, lots of importance should be given to use of Illuppai, Prosopis, Ipomea and Notchi leaves in our Organic Farming strategies.

The adoption level for vermicompost and neem cake/castor oil cakes are 23.33 per cent each. The availability and cost involved in the preparation of these would be the reasons for lower adoption. Higher cost is the main factor for not adopting Panchakavya and Matka (10.00 per cent each) along with the cumbersome procedure involved, even though these were popularized among the farmers. Also number of animals owned are few among the contacted respondents, collection of large quantity of dung was not possible and also the cost involved in the purchase of its constituents like ghee, milk, etc.,

The adoption per cent for application of sewage waste was 10.00 that might be due to the stigma attached in its application. The availability and transport cost involved in the application of pressmud led to its adoption to 6.67 per cent only.

Adoption of biocontrol agents (*Trichogramma chilonis* and *Platygaster oryzae* to the tune of 6.67 and 3.33 per cent respectively) were very low as the farmers do not show any interest and also the reason that so far no severe infestation of leaf folder occurred, in the study area. Farmers who were aware expressed that less conviction about the release of bio control agents and unavailability in large quantities are the major setbacks for non-adoption.

The practices that recorded no adoption among the respondents were growing of *Azolla*, application of Blue Green Algae (BGA), bone meal/fish meal and spent wash. The reason for not using *Azolla* and BGA might be due to the fact that there might not aroused any such necessity to use. The cost factor and its unavailability might have

restricted the adoption of bone meal / fish meal. The spent wash was used to reclaim saline/alkaline soils and the transport cost adds to the price factor.

4.2.2. Awareness and Adoption level of Organic Farming practices in Sugarcane

The overall and practice wise awareness and adoption levels of Organic Farming practices in sugarcane were discussed below.

4.2.2.1. Overall Awareness level of Organic Farming practices in Sugarcane

Using cumulative frequency method, the respondents were classified into low, medium and high awareness level categories and the findings are furnished in table 12.

Table 13. Distribution of respondents according to their Overall Awareness level of Organic Farming practices in Sugarcane

(n=30)

S.No.	Categories	Number	Percentage
1.	Low	--	--
2.	Medium	--	--
3.	High	30	100.00
	Total	30	100.00

It could be inferred from the table 13 that the overall awareness level of sugarcane farmers was found to be very high (100.00 per cent). The reasons for this finding are that the farmers traditionally followed organic way of farming and that the respondents were having good contact with the officials of Department of Agriculture and also with the staff of Kothari Fertilizers Private Ltd. with whom they are contracted. [Fig. 2]

4.2.2.2. Practice wise Awareness level of Organic Farming practices in Sugarcane

The data collected from sugarcane growers is presented in table 14.

Table 14. Distribution of respondents according to their awareness and adoption level of Organic Farming Practices in Sugarcane

(n=30)

S.No.	Organic Farming Practices	Awareness		Adoption	
		Number	Percentage	Number	Percentage
I	Soil fertility management				
a)	Organic manures				
1.	Application of Farm yard manure (FYM)	30	100.00	30	100.00
2.	Application of Biogas slurry	30	100.00	4	13.33
3.	Application of green manures	30	100.00	30	100.00
b)	Composts				
4.	Application of Vermicompost	30	100.00	3	10.00
5.	Application of Sugarcane trash compost	30	100.00	11	36.67
6.	Application of Coir pith compost	30	100.00	6	20.00
7.	Application of Weed compost	30	100.00	19	63.33
8.	Application of Crop residue compost	30	100.00	30	100.00
c)	Bio fertilizers				
9.	Application of <i>Azospirillum</i>	30	100.00	30	100.00
10.	Application of <i>Phosphobacteria</i>	30	100.00	30	100.00
11.	Application of <i>Pseudomonas florescens</i>	30	100.00	30	100.00
d)	Other wastes as manures				
12.	Application of sewage waste	30	100.00	30	100.00
13.	Application of Pressmud	30	100.00	30	100.00
14.	Application of Bone meal / fish meal	30	100.00	6	20.00
15.	Application of neem/castor oil cakes	30	100.00	15	50.00
16.	Application of spent wash	30	100.00	7	23.33
II	Pest & Disease Management				
e)	Biopesticides				
17.	Application of Neem oil 3%	30	100.00	30	100.00
18.	Application of Neem seed kernel extract 5%	30	100.00	30	100.00
f)	Bio control agents				
19.	Release of <i>Trichogramma japonicum</i>	30	100.00	30	100.00
20.	Application of <i>Trichoderma viride</i>	30	100.00	30	100.00
g)	Others				
21.	Panchakavya (a boifertilizer)	18	60.00	2	6.67
22.	Matka (a biopesticide)	18	60.00	2	6.67

Cent per cent of awareness was found for all the Organic Farming practices in sugarcane (except Panchakavya and Matka), which might be due to the fact that the inputs like biofertilizers, biocontrol agents, pressmud and inorganic fertilizers were supplied to them by Kothari Fertilizers Pvt.Ltd on contract. Added to this the awareness campaigns conducted from various institutions and government department would have increased their awareness levels. The farmers' innovations *viz.*, Panchakavya and Matka were known to the farmers to the extent of 60.00 per cent each.

The findings are more or less in coincidence of the findings of Ramesh and Govind (2001&2002) with regard to biofertilizers, bio control agents and biopesticides.

4.2.2.3. Overall Adoption level of Organic Farming practices in Sugarcane

Using cumulative frequency method, the respondents were classified into low, medium and high awareness level categories and the findings are furnished in table 15.

Table 15. Distribution of respondents according to their Overall Adoption level of Organic Farming practices in Sugarcane

(n=30)

S.No.	Categories	Number	Percentage
1.	Low (less than 9.2 score)	--	--
2.	Medium (score of 9.2 to 18.4)	24	80.00
3.	High (more than score of 18.4)	6	20.00
	Total	30	100.00

It could be inferred from the table 15 that the overall adoption level was found to be medium (80.00 per cent) followed by high (20.00 per cent). In general, the overall awareness level of sugarcane farmers about the Organic Farming practices was found to be medium. [Fig. 2]

Similar findings were found by Sriram (1997), Noorjehan (1999), Maheshwari (2000) and Shiraj (2001) in crops like cotton, paddy, vegetables and paddy respectively.

Fig.2.Overall Awareness,Knowledge and Adoption of Organic Farming in Sugarcane

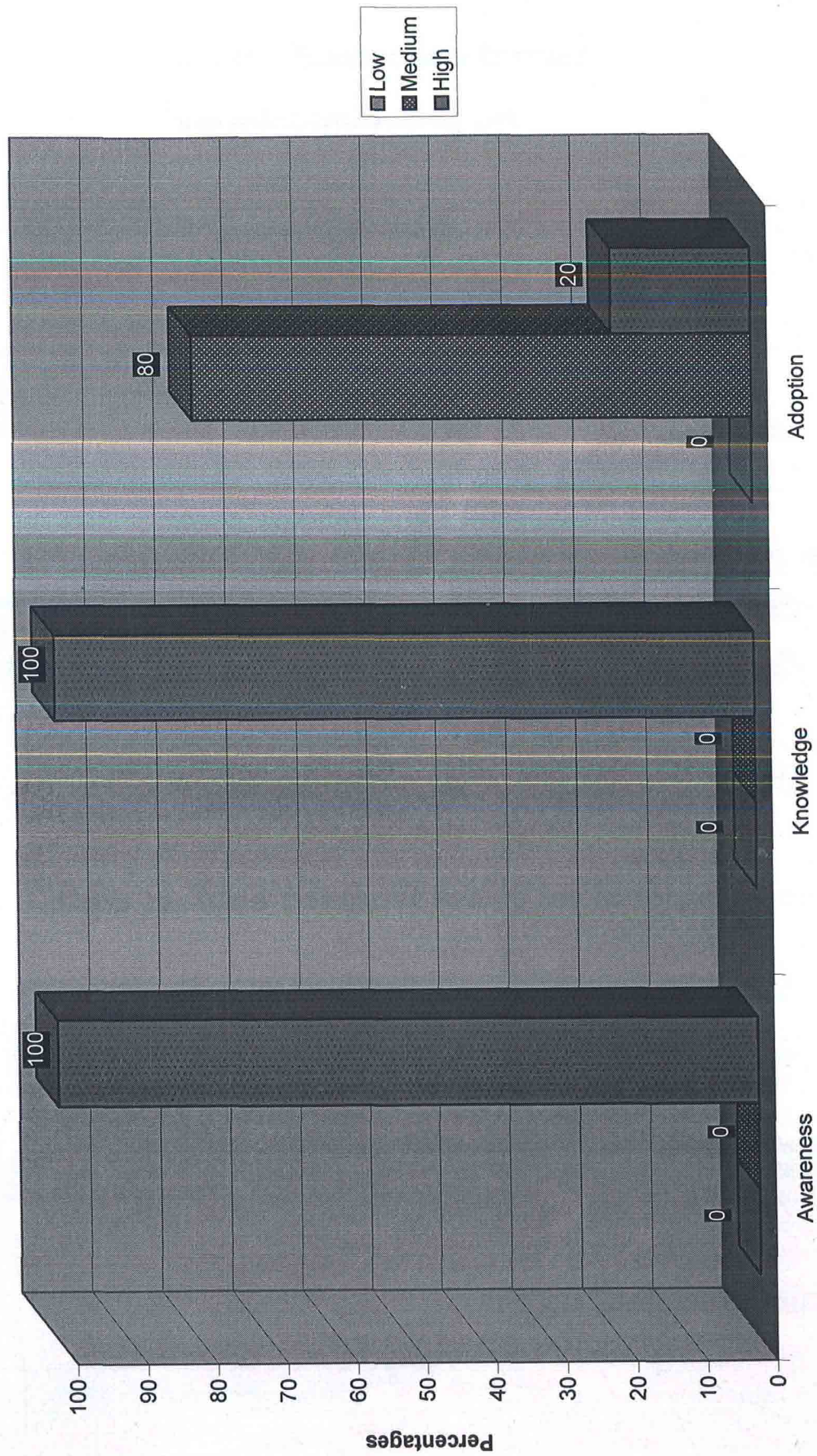


Photo 4. Case study II – Sugarcane farmer showing the vermicomposting pit



Photo 5. Crop residue compost ready for incorporation



4.2.2.4. Practice wise Adoption level of Organic Farming practices in Sugarcane

From the table 14, it could be concluded that cent per cent adoption of organic manures was recorded except biogas slurry (13.33 per cent). Biogas was not popular due to odours and difficulty to maintain, as it requires large quantity of dung and constant stirring. Among the composts, except for crop residue and weed compost (100.00 & 63.33 per cent respectively), lesser adoption was noticed due to the time consuming and tedious processes involved. The unavailability and cost factor were the other reasons.

Adoption of biofertilizers, biopesticides and bio control agents were also recorded cent per cent. This might be due to the obvious advantages of their use.

The findings are more or less in coincidence of the findings of Ramesh and Govind (2001&2002).

Fifty per cent of the respondents applied neem cake/castor oil cakes due to the cost factor and unavailability of raw materials. Bone meal / fishmeal powder were used to a lesser extent as large quantity was not instantly available. Though spent wash could be widely utilized to reclaim problem soils, the lower adoption per cents of 20.00 and 23.33 were only recorded. The adoption level for Panchakavya and Matka were meagre (6.67 per cent each) as it required higher capital investment and involvement of cumbersome procedure of preparation.

4.3. Knowledge level of Organic Farming practices

Adoption of any innovation is mostly influenced by the knowledge level of the farmers i.e., the farmers' understandability of the recommended technologies. Overall and practice wise knowledge level of the paddy and sugarcane growers were studied and the findings are presented below under different sub-heads.

4.3.1. Knowledge level of Organic Farming practices in Paddy

4.3.1.1. Overall Knowledge level of Organic Farming practices in Paddy

Using cumulative frequency method, the respondents were classified into low, medium and high knowledge level categories and the findings are furnished in table 16.

Table 16. Distribution of respondents according to their Overall Knowledge level of Organic Farming practices in Paddy

(n=30)

S.No.	Categories	Number	Percentage
1.	Low (less than 6.4 score)	--	--
2.	Medium (score of 6.4 to 12.8)	26	86.67
3.	High (more than score of 12.8)	4	13.33
	Total	30	100.00

It could be inferred from the table 16 that overall knowledge level of majority of the paddy growers was found to be medium (86.67 per cent) followed by high (13.33 per cent). This might be due to the fact that paddy continues to be the staple food and the farmers' experience in paddy cultivation might have added up to their knowledge level. [Fig. 1]

In cotton crop, same findings are reported by Varghese (1998).

4.3.1.2. Practice wise Knowledge level of Organic Farming practices in Paddy

Further attempts were made to analyse the knowledge level of the paddy farmers with respect to each Organic Farming practice. Individual, item wise per cent was worked out and the findings are given in table 17.

Table 17. Distribution of respondents according to their Practice wise Knowledge level on Organic Farming practices in Paddy

(n=30)

S.No	Knowledge items	Number	Percentage
1.	Recommended quantity of Farmyard Manure (FYM) as basal application	24	80.00
2.	Stages of application of bio fertilizers	30	100.00
3.	Recommended dose for application of Green manures / Green leaf manures	30	100.00
4.	Recommended dose for pressmud application	3	10.00
5.	Recommended dose of vermicompost	11	36.67
6.	Time interval for application of vermicompost	12	40.00
7.	Quantity of <i>Azospirillum/ Phosphobacteria</i> recommended for i) seed treatment ii) seedling treatment iii) soil application	30	100.00
8.	Recommended dose for <i>Pseudomonas fluorescens</i>	13	43.33
9.	Recommended dose for growing <i>Azolla</i>	2	6.67
10.	Recommended dose for growing Blue Green Algae	2	6.67
11.	Dosage of neem oil 3%	30	100.00
12.	Dosage of neem seed kernel extract 5%	30	100.00
13.	Recommended dosage of release of bio control agents	12	40.00

The table 17 revealed that five practices viz., stages for application of bio fertilizers and recommended dosage of application of green manures / green leaf manures, *Azospirillum*, *Phosphobacteria*, neem oil and neem seed kernel extract recorded cent per cent knowledge level that formed usual way of their cultivation. The knowledge on the application of farmyard manure was 80.00 per cent as it was an age old practice and farmers don't hesitate to apply more the recommended that enriches their soil.

The findings are in line with Snehathala (1991) and Alagesan (1999) on *Azospirillum* application.

This was followed by application of *Pseudomonas fluorescens* (43.33 per cent). The farmers follow seed treatment with *Azospirillum* and *Phosphobacteria* only that were known to them for years and available on subsidized rates easily.

Except big and progressive farmers, others do not possessed knowledge on correct dosage of application of vermicompost and its time interval of application (36.67 and

40.00 per cent respectively). The knowledge on the dosage of release of bio control agents was 40.00 per cent, as the respondents don't know its uses.

Least knowledge level was recorded for the practices *viz.*, growing *Azolla* and BGA (6.67 per cent each) and pressmud application (10.00 per cent). The main reason is its unavailability in season and no interest to gain information on these practices.

4.3.2. Knowledge level of Organic Farming practices in Sugarcane

4.3.2.1. Overall Knowledge level of Organic Farming practices in Sugarcane

Based on the data collected, the sugarcane growers were classified into low, medium and high knowledge categories using cumulative frequency and the results are presented in table 18.

Table 18. Distribution of respondents according to their Overall Knowledge level of Organic Farming practices in Sugarcane

(n=30)

S.No.	Categories	Number	Percentage
1.	Low (less than 3.9 score)	--	--
2.	Medium (score of 3.9 to 7.9)	--	--
3.	High (more than score of 7.9)	30	100.00
	Total	30	100.00

From the table 18, it is clearly seen that overall knowledge level was very high (100.00 per cent) among the sugarcane growers about the Organic Farming practices. The major reason behind this was eventually the presence of Kothari Fertilizers Pvt.Ltd. in Lalgudi block, which had taken the contract of almost all the sugarcane farmers. [Fig. 2]

Similar findings are reported by Maheshwari (2000) and Shiraj (2001) on knowledge level of organic farming practices in vegetables and paddy respectively.

4.3.2.2. Practice wise Knowledge level of Organic Farming practices in Sugarcane

To analyse the practice wise knowledge level of sugarcane growers, individual item wise per cent was worked out and furnished in the following table 19.

Table 19. Distribution of respondents according to their Practice wise Knowledge level Organic Farming practices in Sugarcane

(n=30)

S.No	Knowledge items	Number	Percentage
1.	Recommended quantity of Farmyard Manure (FYM) as basal application	30	100.00
2.	Stages of application of bio fertilizers	30	100.00
3.	Recommended dose for application of Green manures	30	100.00
4.	Recommended dose for pressmud application	30	100.00
5.	Recommended dose of vermicompost	17	56.67
6.	Time interval for application of vermicompost	13	43.33
7.	Quantity of <i>Azospirillum</i> / <i>Phosphobacteria</i> recommended for soil application & Sett treatment	30	100.00
8.	Recommended dose of <i>Pseudomonas florescens</i>	30	100.00
9.	Dosage of neem oil 3%	30	100.00
10.	Dosage of neem seed kernel extract 5%	30	100.00
11.	Recommended dosage for sett treatment of <i>Trichoderma viride</i>	30	100.00
12.	Recommended dose of release of bio control agents	30	100.00
13.	<i>Tichogramma</i> for the control of Internode borer	30	100.00

The table 19 reveals that among the sugarcane growers, cent per cent knowledge level was recorded for most of the Organic Farming practices except the practices viz., dosage of vermicompost and the time interval of vermicompost application (56.67 and 43.33 per cent respectively). For sugarcane crop, large quantity of vermicompost @ 2 t/ha is required and it was difficult for all the farmers to get such a large quantity at a time. The farmers are bound to the factory rules and norms. These may be the causes for hindering the access towards vermicompost.

The findings are in line with Snehalatha (1991) and Alagesan (1999) on *Azospirillum* application.

4.4. Advantages and constraints in the adoption of Organic Farming practices

Any practice or technology or innovation certainly may have certain advantages and disadvantages. Besides, the farmers also may face some constraints in adopting new practices (or) modifying the existing ones.

Most important advantages and constraints were listed out and based on the farmers' rankings; they were ranked in the chronological order of most significant to least important ones. The findings are presented in the following sub-heads.

4.4.1. Advantages in the adoption of Organic Farming practices

The findings are listed in table 20.

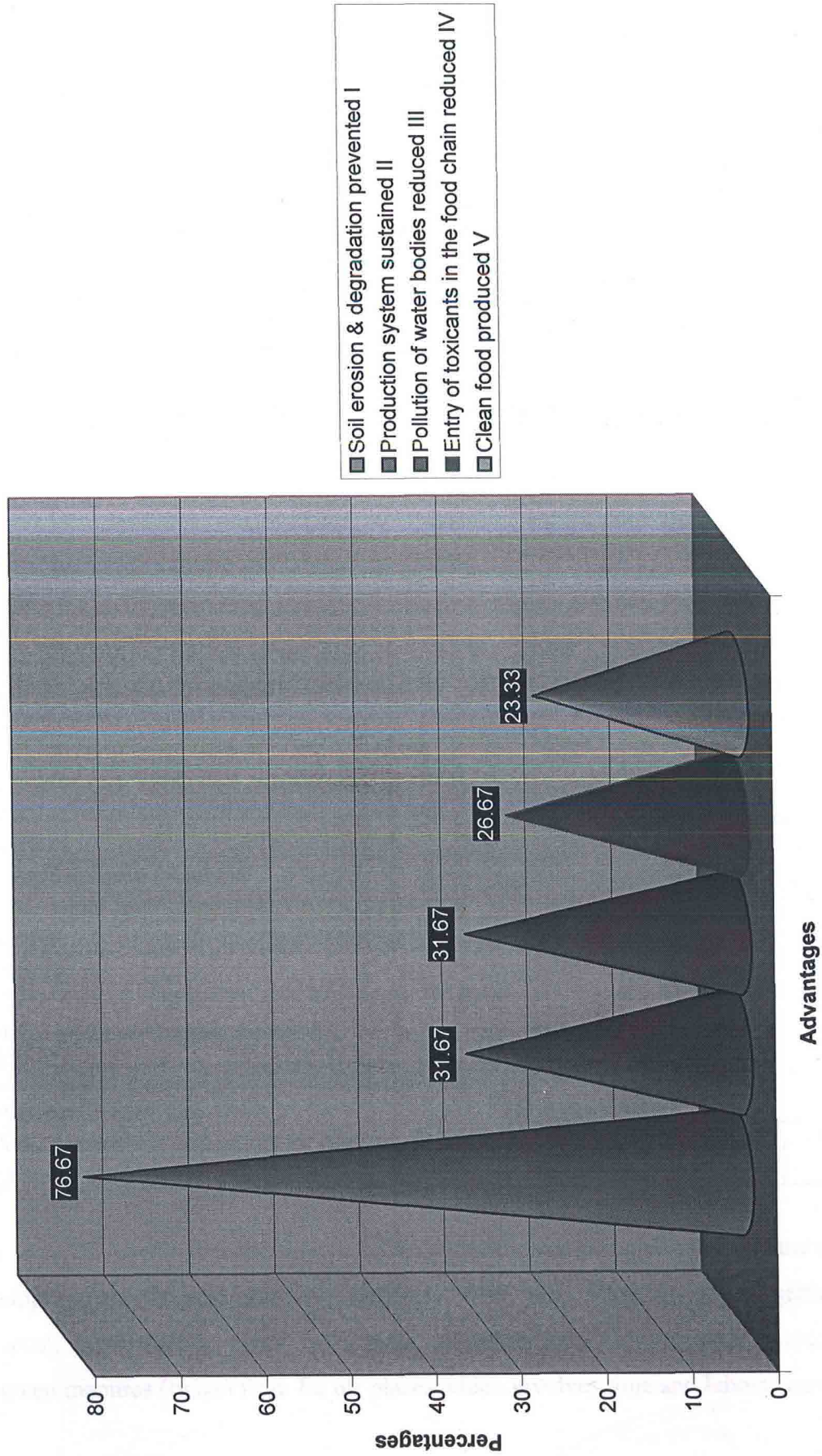
Table 20. Advantages in the adoption of Organic Farming practices

(n=60)				
S.No.	Advantages	Number	Percentage	Rank
1.	Soil erosion and degradation prevented	46	76.67	I
2.	Production system sustained depending on on-farm resources	19	31.67	II
3.	Pollution of water bodies reduced	19	31.67	III
4.	Entry of toxicants in the food chain reduced	16	26.67	IV
5.	Clean foods produced	14	23.33	V
6.	Damage to environment prevented	20	33.33	VI
7.	Natural resources conserved	19	31.67	VII
8.	Green manures act as organic amendments	24	40.00	VIII
9.	Micronutrient availability in soil (except molybdenum) increased	24	40.00	IX
10.	Prospects of export of organically produced foods enhanced	43	71.67	X

The table 20 shows that the five most important advantages were prevention of soil erosion and degradation, sustenance of production system depending on on-farm resources, reduction of pollution of water bodies, reduction of toxicants in the food chain and production of clean foods through Organic Farming. [Fig. 3]

Frietas (1995) also reported similar findings that organic fertilization conserve soil.

Fig.3.Advantages of Organic Farming



The last ranked advantage say, Prospects of export of organically produced foods could be visualized as the income generating one in future if government takes appropriate steps to promote Organic Farming and its products.

4.4.2. Constraints in the adoption of Organic Farming practices

The findings are listed in table 21.

Table 21. Constraints in the adoption of Organic Farming practices

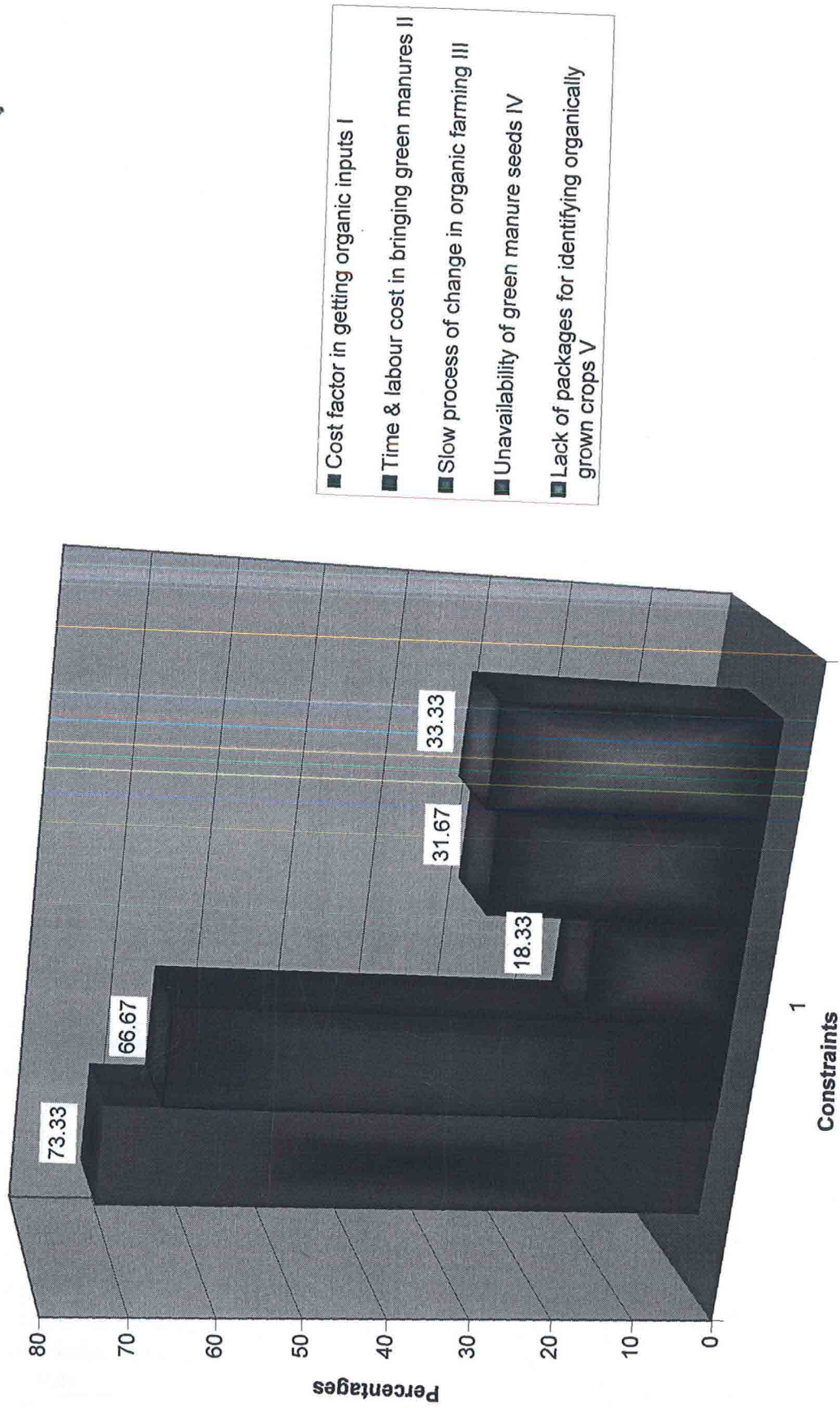
(n=60)

S.No.	Constraints	Number	Percentage	Rank
1.	Cost factor in getting vermicompost, biofertilizers, oil cakes <i>etc.</i> , from outside sources	44	73.33	I
2.	Bringing green manures (twigs) from far off place that involves time and labour cost (<i>insitu</i> cost)	40	66.67	II
3.	Slow process of change in Organic farming	11	18.33	III
4.	Unavailability of green manure seeds	19	31.67	IV
5.	Lack of packages for identifying organically grown crops	20	33.33	V
6.	Lack of knowledge on few organic farming practices <i>viz.</i> , Integrated nutrient management practices and biological control of pests and diseases	23	38.33	VI
7.	Far off training locations	23	38.33	VII
8.	More water requirement for vermicomposting	15	25.00	VIII
9.	Availability of <i>Azolla</i> in rainy season only	48	80.00	IX
10.	Others More risk of getting lower net profit in the initial years of Organic Farming	35	58.33	X
11.	Socio-econo-cultural factors hindering adoption of Organic Farming	30	50.00	XI
12.	Poor interest in adoption of newer Organic Farming practices	33	55.00	XII

The table 21 reveals that the foremost five constraints as perceived by the farmers in the adoption of Organic Farming practices were *viz.*, Cost factor in getting vermicompost, biofertilizers, neem cake/castor oil cakes *etc.*, from outside sources, bringing green manures (twigs) from far off places which involves time and labour (*insitu*



Fig.4. Constraints in Adoption of Organic Farming



cost), slow process of change in Organic farming, unavailability of green manure seeds in time and lack of packages for identifying organically grown crops. [Fig. 4]

Similar findings were reported by Ranganatha *et al.* (2001) and Shiraj (2001) that cost involved in Organic Farming is high.

4.5. Training needs of farmers practicing Organic Farming

Through training, a farmer / individual improves his skill, knowledge and attitude towards a practice. Keeping this in view, the data were collected on areas such as subject matter preferred for training and method of training. The suggestions were also collected improve the training programmes and discussed under separate headings.

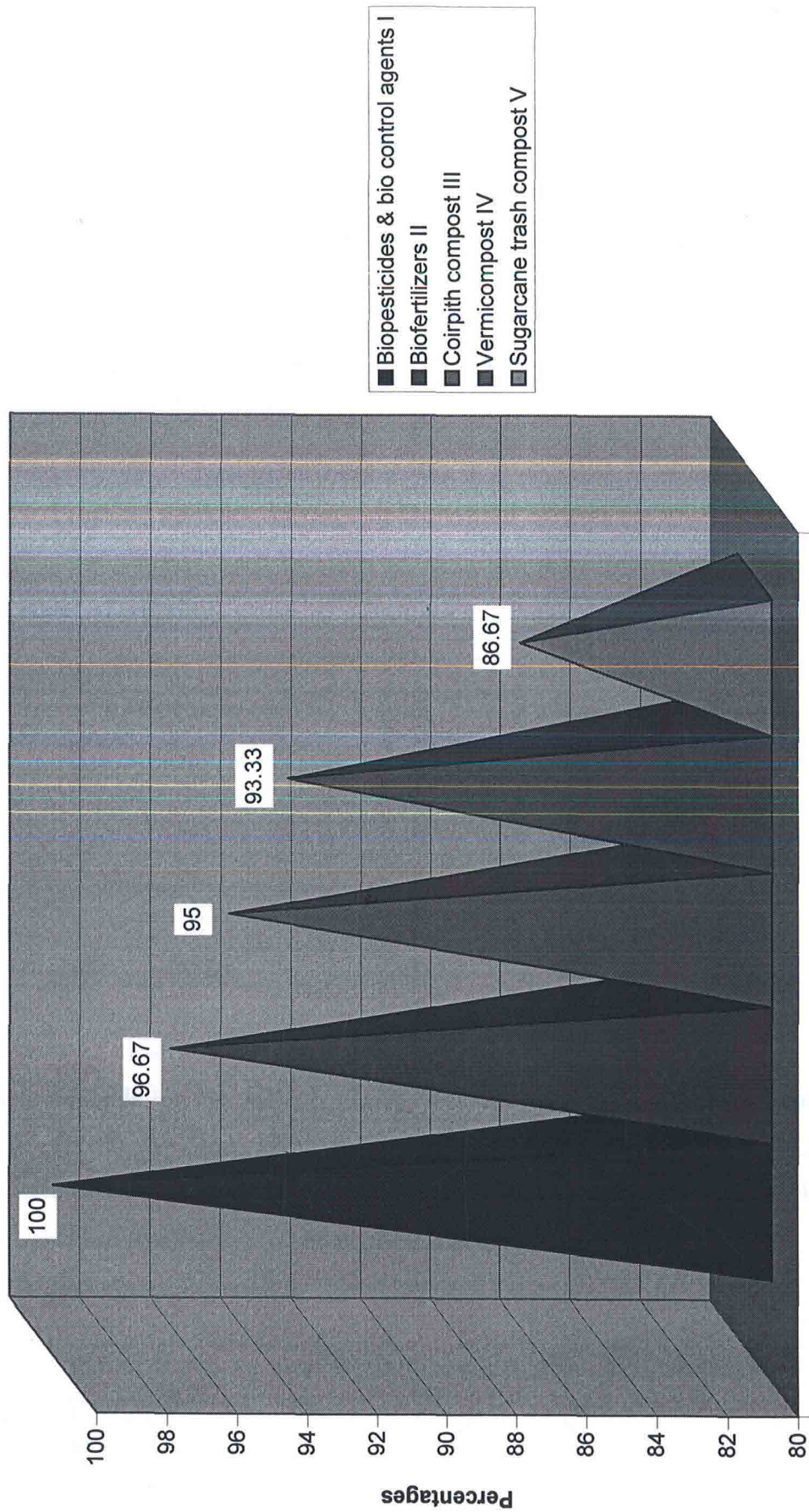
4.5.1. Training needs of farmers practicing Organic Farming

The collected data are presented in table 22.

Table 22. Distribution of respondents according to their Training Needs on Organic Farming (n=60)

S. No	Activities/Subject matter	Number	Percentage	Rank
1.	Farm yard manuring	25	41.67	
2.	Biogas slurry	44	73.33	VII
3.	Vermi compost	56	93.33	IV
4.	Sugarcane trash compost	52	86.67	V
5.	Coir pith compost	57	95.00	III
6.	Biofertilizers	58	96.67	II
7.	Pressmud	17	28.33	
8.	Bonemeal / fishmeal	27	45.00	
9.	Oilcakes	23	38.33	
10.	Biopesticides	60	100.00	I
11.	Biocontrol agents	60	100.00	I
12.	Others Enriched Farm yard manuring	46	76.67	VI
13.	Panchakavya	30	50.00	
14.	Matka	30	50.00	
15.	Indigenous Technical Knowledge in Organic Farming	20	33.33	

Fig.5.Training Needs of Farmers Practicing Organic Farming



From the table 22, the first five ranks given for the subject areas were selected as the most important areas for giving training as these were perceived as important ones by more than two-third of the respondents. They were biopesticides (100.00 per cent), bio control agents (100.00 per cent), biofertilizers (96.67 per cent), coirpith compost (95.00 per cent), vermicompost (93.33 per cent) and sugarcane trash compost (86.67 per cent). [Fig. 5]

The findings of Maheshwari (2000) was in coincidence with the present study.

4.5.2. Training methods preferred by the farmers practicing Organic Farming

The collected data are presented in table 23.

Table 23. Distribution of respondents according to their Identification of Training methods on Organic Farming Practices

(n=60)

S.No.	Method of training	Number	Percentage	Rank
1.	Lectures	2	3.33	
2.	Discussions	27	45.00	
3.	Demonstrations/Hands on experiences	60	100.00	I
4.	Field visits	60	100.00	I
5.	Exhibitions	36	60.00	IV
6.	Study tours	60	100.00	I
7.	Video lessons	45	75.00	III
8.	Slides	60	100.00	I
9.	OHPs	2	3.33	
10.	Participatory trainings	47	78.33	II

The table 23 clearly shows that more than half of the respondents perceived first four ranked methods as the most preferred methods viz., Demonstrations/Hands on experiences (100.00 per cent), Field visits (100.00 per cent), Study tours (100.00 per cent), Slides (100.00 per cent), Participatory trainings (78.33 per cent), Video lessons (75.00 per cent) and Exhibitions (60.00 per cent) for their training.

Similar findings are reported by Raji (1991) and Perumal (1994).

4.5.3. Suggestions offered by the respondents to make the training programmes more effective

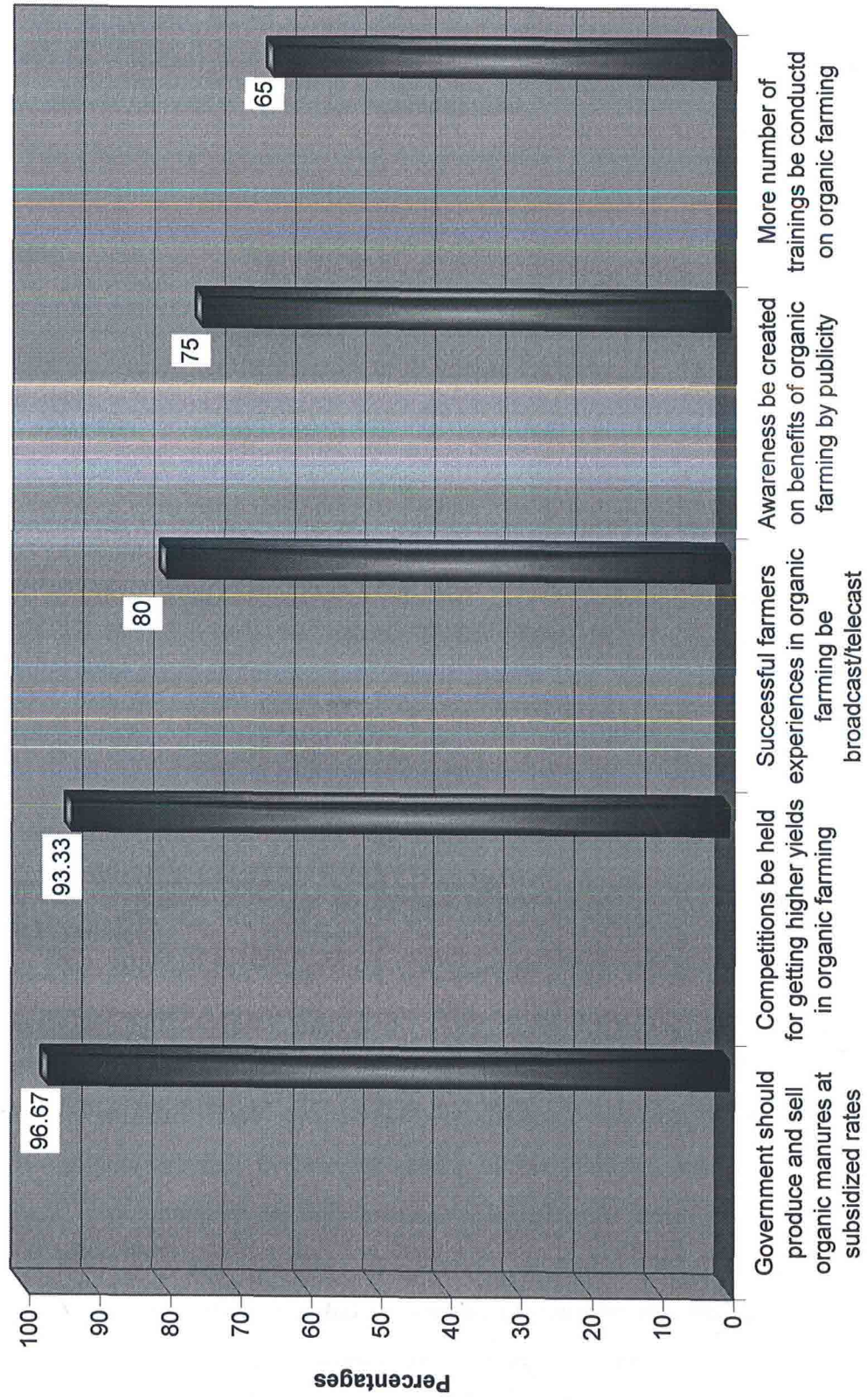
The data collected are shown in table 24.

Table 24. Suggestions offered by the respondents to make the training programmes more effective (n=60)

S.No.	Suggestions	Number	Percentage
1.	More hours be allotted to practical than mere theory	60	100.00
2.	Visit to successful farmers field practicing Organic Farming	58	96.67
3.	Venue of training be nearer	50	83.33
4.	Interactive sessions be included	45	75.00
5.	Sufficient printed materials be provided	57	95.00
6.	Need based trainings be arranged	56	93.33
7.	Trainings be area / season bound	50	83.33
8.	Duration of training be short	48	80.00
9.	Income oriented trainings be conducted	49	81.67
10.	Publicity about the conduct of the trainings be made	42	65.00
11.	Study tours be taken to other districts/state during the training period	35	58.33
12.	Off-season trainings be arranged	28	46.67
13.	Incentives be given during the training to encourage the participants	25	41.67

It could be enumerated from the table 24 that the important suggestions offered by more than two-third of the respondents to make the training programmes more effective are viz., more hours be allotted to practical than mere theory, visit to successful farmers field practicing Organic Farming, sufficient printed materials be provided, need based trainings be arranged, venue of training be nearer, trainings be area / season bound, income oriented trainings be conducted, duration of training be short, interactive sessions be included and publicity about the conduct of the trainings be made.

Fig.6.Suggestions to Overcome Constraints in Adoption of Organic Farming



4.6. Suggestions to overcome the constraints in the adoption of Organic Farming

The suggestions offered by the respondents to overcome the constraints in the adoption of Organic Farming are presented in table 25. The most repetitive and impressive suggestions were taken for further interpretations.

Table 25. Suggestions to overcome the constraints in the adoption of Organic Farming

(n=60)			
S.No.	Suggestions	Number	Percentage
1.	Awareness be created on the benefits of Organic Farming by publicity	45	75.00
2.	Group approach / village approach be followed to popularise organic farming	33	55.00
3.	More number of trainings be offered on Organic Farming	42	65.00
4.	Government should commercially produce and sell organic manures at subsidised rates	58	96.67
5.	Varieties suited to Organic Farming be released	38	63.33
6.	Competitions may be held for getting higher yields in Organic Farming	56	93.33
7.	Successful farmers' experiences in Organic farming be broadcast/telecast	48	80.00
8.	Package of Organic Farming practices for various crops be suggested	25	41.67
9.	Marketing information of selling organically produced crops be made available through latest media	20	33.33
10.	Government programmes/ policy be framed to popularise Organic Farming	23	38.33

The following were most significant suggestions offered by more than half of the respondents viz., Government should commercially produce and sell organic manures at subsidised rates, competitions may be held for getting higher yields in organic farming, successful farmers' experiences in organic farming be broadcast/telecast, awareness be created on the benefits of organic farming by publicity, more number of trainings be offered on organic farming, varieties suited to organic farming be released and group approach / village approach be followed to popularise organic farming. [Fig 6.]

***SUMMARY AND
CONCLUSIONS***

CHAPTER V

SUMMARY AND CONCLUSIONS

The summary and conclusions of the study are presented under different sub heads in this chapter.

Modern agriculture, with its potential to take the country out of food traps and to reach an area of self-sufficiency in food production has to cope with hazards like declining productivity in agriculture, impoverishment of soil fertility and environmental pollution.

The preferred way to protect our soil fertility and surrounding environment is to opt for Organic Farming. It is essential to formulate package of practices of Organic Farming methods in cultivating various crops. Extension efforts need to be directed to increase the adoption level of farmers in respect of Organic Farming practices and training programmes should be organised in villages to teach farmers on Organic Farming practices.

Keeping these in view, a study was conducted with the following specific objectives.

- 1, To study the awareness, knowledge and adoption of Organic Farming related to production and protection of major field crops.
2. To enlist the advantages and constraints in the adoption of Organic Farming as perceived by the farmers.
3. To assess the training needs of farmers practicing Organic Farming.
4. To list out the farmers' suggestions to overcome the constraints in the adoption of Organic Farming.

The study was conducted in Lalgudi block of Tiruchirapalli district by focusing on two major wetland crops viz., paddy and sugarcane. By random sampling, a sample size of 60 was chosen (30 each for paddy and sugarcane) from six villages namely, Poovalur, Sirumayamgudi and Mettupatti for Sugarcane crop and Keelaperungavur, Melaperungavur and Valadi for Paddy crop.

The respondents were interviewed for their awareness, knowledge, adoption and training needs on Organic Farming in paddy and sugarcane crops. The data were collected by using a pre-tested and well-structured interview schedule. Within the sample size, two case studies were also conducted.

By using statistical tools such as simple percentage analysis and cumulative frequency, precise and meaningful inferences were made.

5.1. Salient findings of the study

The most important and significant findings of the study are summarized below.

5.1.1. Profile characteristics of the respondents

- More than half (58.33 per cent) of the respondents were in the old age category followed by middle age (25.00 per cent) and young age category (16.67 per cent).
- A little less than half of respondents (45.00 per cent) had secondary education followed by primary to middle education (46.67 per cent) and only 8.33 per cent were collegiates.
- A vast majority of the respondents (91.67 per cent) had agriculture as their main occupation followed by 8.33 per cent of the respondents who were engaged in allied activities.
- Two-third of the respondents (66.67 per cent) had to high farming experience while 23.33 per cent of the respondents had medium level of farming experience. One-tenth of them (10.00 per cent) had low level of farming experience.
- Sixty (60.00) per cent of the respondents possessed farm size upto 5 acres followed by 36.67 per cent having farm size between 5 and 10 acres and a meagre of 3.33 per cent possessed land holdings above 10 acres.
- Among the sources of information, the respondents' preferred individual contact methods followed by group contact methods and mass contact methods. Within the individual contact methods, the respondents preferred fellow farmers (100.00 per cent), dealers/seed agency (100.00 per cent), Agricultural department officials (93.33 per cent), and friends and relatives (91.67 per cent each). The group contact methods like adaptive research trials and demonstrations were preferred by 83.33 per cent of the respondents in each category. Among mass contact

- methods, radio and newspaper were preferred to the most (100.00 per cent each) followed by exhibitions (83.33 per cent), magazines (75.00 per cent) and television (58.33 per cent).

5.1.2. Awareness and Adoption level Organic Farming practices in Paddy

- The overall awareness level was found to be very high (100.00 per cent).
- The respondents had cent per cent of awareness on biopesticides, composts and farmers' innovations like Panchakavya and Matka.
- Cent per cent awareness prevailed for application of farmyard manure, green manures, green leaf manures, goat & duck droppings, cured poultry manure, *Azospirillum*, *Phosphobacteria*, sewage waste, pressmud, bone meal/fish meal, and neem cake / castor oil cake.
- Awareness on release of *Trichogramma japonicum* was 93.33 per cent followed by awareness on release of *Trichogramma chilonis* *Platygaster oryzae* and application of biogas slurry to the tune of 83.33 per cent each respectively.
- Awareness on application of spent wash and *Pseudomonas florescens* were in the order of 66.67 and 53.33 per cent. Blue Green Algae and *Azolla* were grown by 36.67 per cent each.
- The overall adoption level was found to be low (60.00 per cent) to medium (40.00 per cent).
- The respondents reported cent per cent adoption for the practices viz., application of farmyard manure, green manures, green leaf manures, weed compost, *Azospirillum*, *Phosphobacteria*, neem oil 3 % and neem seed kernel extract 5 %.
- The practices such as application of goat and duck droppings and release of *Trichogramma japonicum* were 53.33 and 43.33 per cent respectively.
- The practices which recorded no adoption among the respondents were growing of *Azolla*, application of Blue Green Algae, bone meal/fish meal and spent wash.
- All other practices like release of *Trichogramma chiloni* and *Platygaster oryzae*, application of pressmud, Panchakavya (a biofertilizer), Matka (a biopesticide), sewage waste, vermicompost, cured poultry manures, Illuppai oil 6%, *Prosopis*

leaf extract, *Ipomea* leaf extract, and Notchi leaf powder extract showed lesser per cent of adoption.

5.1.3. Knowledge level of Organic Farming practices in Paddy

- The overall knowledge level of majority of the paddy farmers was found to be medium (86.67 per cent) followed by high (13.33 per cent).
- Cent per cent knowledge level was noticed regarding the stages of application of biofertilizers, recommended dosage for application of green manures/green leaf manures, use of neem oil 3% and neem seed kernel extract 5% followed by basal application of farmyard manure (80.00 per cent).
- Less than half of the respondents had knowledge on recommended dosage on application of *Pseudomonas fluorescens*, other bio control agents, vermicompost and time interval for application of vermicompost.
- A meagre per cent of 6.67 was recorded on the knowledge level of growing *Azolla* and recommended dosage of Blue Green Algae.

5.1.4. Awareness and Adoption level of Organic Farming practices in Sugarcane

- The overall awareness level of sugarcane farmers was found to be very high (100.00 per cent).
- Except for the farmers' innovations (Panchakavya and Matka), all other Organic Farming practices *viz.*, application of organic manures, composts, biofertilizers, other waste as manures, biopesticides and bio control agents recorded cent per cent awareness among the respondents.
- The awareness on the application of Panchakavya and Matka were 60.00 per cent each.
- The overall adoption level was found to be medium (80.00 per cent) followed by high (20.00 per cent).
- Cent per cent adoption was recorded for the adoption of biofertilizers, biopesticides and bio control agents.
- Cent per cent adoption was found for the practices – application of farmyard manure, green manures, crop residue composts, sewage waste and pressmud.

- About 63.33 per cent of the farmers adopted application of weed compost followed by 50.00 per cent of the respondents who had applied neem cake/castor oil cake.
- Only a few respondents (6.67 per cent) adopted Panchakavya and Matka.

5.1.5. Knowledge level of Organic Farming practices in Sugarcane

- The overall knowledge level of all the sugarcane farmers was found to be very high (100.00 per cent).
- Cent per cent knowledge level was noticed for stages for application of biofertilizers, recommended dosage for application of farmyard manure as basal, green manures, pressmud, *Azospirillum*, *Phosphobacteria*, *Pseudomonas fluorescens*, neem oil 3%, neem seed kernel extract 5% sett treatment with *Trichoderma viride* and release of bio control agents followed by vermicompost (56.67 per cent) and time interval for application of vermicompost (43.33 per cent).

5.2. Advantages and constraints in the adoption of Organic Farming

- The five most important advantages by adopting Organic Farming as perceived by the respondents in the chronological order were soil erosion and degradation prevented, production system sustained depending on on-farm resources, pollution of water bodies reduced, entry of toxicants in the food chain reduced and clean food produced.
- The five major constraints in adopting Organic Farming in the chronological order were cost factor in getting vermicompost, neem cake/castor oil cakes etc., from outside sources, bringing green manures (twigs) from far off places that involves time and labour cost (*insitu* cost), slow process of change in organic farming, unavailability of green manure seeds and lack of packages for identifying organically grown crops.

5.3. Training Needs of farmers practicing Organic Farming

- The five foremost subject matter areas preferred / ranked by the respondents as training needs were on biopesticides (100.00 per cent), bio control agents (100.00 per cent), biofertilizers (96.67 per cent), coirpith compost (95.00 per cent), vermicompost (93.33 per cent) and sugarcane trash compost (86.67 per cent).
- The most preferred training methods as perceived by the farmers were demonstrations/ hands on experience (100.00 per cent), field visits (100.00 per cent), study tours (100.00 per cent), slides (100.00 per cent), participatory training (78.33 per cent), video lessons (75.00 per cent) and exhibitions (60.00 per cent).
- Following significant suggestions were given by the respondents to make the training programmes more effective viz., more hours be allotted to practical than theory (100.00 per cent), visits to successful farmers' field practicing Organic Farming be increased (96.67 per cent), sufficient printed material be provided (95.00 per cent), need based trainings be arranged (93.33 per cent), trainings be area/ season bound (83.33 per cent), venue of trainings be nearer (83.33 per cent), income oriented trainings be conducted (81.67 per cent), duration of training be short (80.00 per cent), interactive sessions be included (75.00 per cent), publicity about the conduct of training be made (65.00 per cent) and study tours to other districts / states be conducted during the training period (58.33 per cent).

5.4. Suggestions to overcome the constraints in the adoption of Organic Farming

The following were the suggestions offered by the respondents to overcome the constraints in adoption of Organic Farming.

- Government firms should commercially produce and sell organic manures at subsidised rates (96.67 per cent)
- Competitions may be held for getting higher yields in Organic Farming (93.33 per cent)
- Successful farmers' experiences in Organic farming (80.00 per cent) be broadcast/telecast
- Awareness be created on the benefits of Organic Farming by publicity (75.00 per cent)
- More number of trainings be offered on Organic Farming (65.00 per cent)

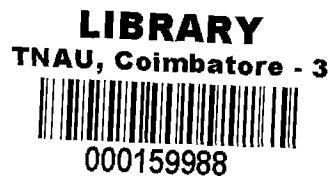
- Varieties suited to Organic Farming be released (63.33 per cent)
- Group approach / village approach be followed to popularize Organic Farming (55.00 per cent).

5.5. Implications of the Study

1. Adequate researches be taken up to minimize the constraints in the adoption of Organic Farming practices especially in the case of use of biogas slurry, vermicompost, sugarcane trash compost, coirpith compost, weed compost, bone meal/fish meal, bio control agents, and also farmers' innovations like Panchakavya and Matka.
2. Extension personnel may allocate more time in creating awareness on Organic Farming through awareness campaigns, media publicity and conduct of frequent trainings on Organic Farming.
3. Government should make policy measures for the promotion of Organic Farming by incorporating various subsidies exclusively for farmers practicing Organic Farming.

5.6. Suggestions for Future Research

1. Similar studies can be taken up in other field crops including commercial crops.
2. An exclusive and intensive study may be taken up to find out the constraints in the adoption of Organic Farming practices with a large sample size.
3. Similar studies can be taken up in different agro-climatic zones of Tamil Nadu.
4. A comparative study on the role of NGOs and State development departments in promoting Organic Farming may also be useful.

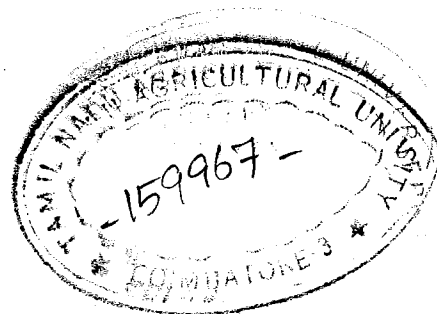


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APPENDICES

INTERVIEW SCHEDULE

ORGANIC FARMING IN TAMIL NADU: A MULTIDIMENSIONAL ANALYSIS

Part – I

Village

Taluk

1. Farmer's Name :
2. Age : ----- (years)
3. Educational status : Illiterate / functionally literate / Primary / Middle /
Secondary / Collegiate
4. Occupational status : Agriculture – primary / secondary
5. Farming Experience (years) :
6. Farm size (acres) :
7. Social participation : *Membership:* No/in one organization/ >one organization
Office bearer: in one organization/ >one organization
8. Sources of information : 1. Radio / Television / Newspapers / Magazines
2. Fellow farmers / Friends / Relatives / Neighbours /
Village leaders
3. Research scientists / Agricultural dept. officials
4. Dealers / Seed agency / Exhibition / Adaptive trials /
Demonstrations / Others

Part II – Awareness and Adoption of Organic Farming Practices in Paddy

S.No.	Organic Farming Practices	Awareness		Adoption	
		Aware	Not aware	Adopted	Not adopted
I	Soil fertility management				
a)	Organic manures				
1.	Application of Farm yard manure(FYM)				
2.	Application of Biogas slurry				
3.	Application of green manures				
4.	Application of green leaf manures				
5.	Application of goat & duck droppings				
6.	Application of cured poultry manures				
b)	Composts				
7.	Application of Vermicompost				
8.	Application of Coir pith compost				
9.	Application of Weed compost				
c)	Bio fertilizers				
10.	Growing of <i>Azolla</i> as a dual crop				
11.	Application of Blue Green Algae				
12.	Application of <i>Azospirillum</i>				
13.	Application of <i>Phosphobacteria</i>				
14.	Application of <i>Pseudomonas floescens</i>				
d)	Other wastes as manures				
15.	Application of sewage waste				
16.	Application of Pressmud				
17.	Application of Bone meal / fish meal				
18.	Application of neem/castor oil cakes				
19.	Application of spent wash				
II	Pest & Disease Management				
e)	Biopesticides				
20.	Application of Neem oil 3%				
21.	Application of Neem seed kernel extract 5%				
22.	Application of Illuppai oil 6%				
23.	Application of <i>Prosopis</i> leaf extract				
24.	Application of <i>Ipomea</i> leaf extract				
25.	Application of Notchi leaf powder extract				
f)	Bio control agents				
26.	Release of <i>Trichogramma japonicum</i>				
27.	Release of <i>Trichogramma chilonis</i>				
28.	Release of <i>Platygaster oryzae</i>				

Part III - Knowledge on Organic Farming Practices in Paddy

1. Recommended quantity of Farmyard Manure (FYM) as basal application **12.5 t/ha**
2. Stages of application of organic manures. **Seed / Seedling / Basal / All**
3. Recommended dose for application of Green manures / Green leaf manures **6.25 t/ha**
4. Recommended dose for pressmud application **5 t/ha**
5. Recommended dose of vermicompost **one t/ha**
6. Time interval for application of vermicompost **once in two years**
7. Quantity of *Azospirillum/ Phosphobacteria* recommended for
 - i) seed treatment **3 packets / ha**
 - ii) seedling treatment **5 packets / ha**
 - iii) soil application **10 packets / ha**
8. Recommended dose for *Pseudomonas fluorescens* **10 g / Kg of seeds**
9. Recommended dose for growing *Azolla* **one Kg / cent**
10. Recommended dose for growing Blue Green Algae **10 Kg / ha**
11. Dosage of neem oil 3% **15 lit / ha**
12. Dosage of neem seed kernel extract 5% **25 Kg/ha**
13. Recommended dosage of release of bio control agents. **5ml/ha/release**

Part IV – Training Needs on Organic Farming Practices

A. Do you require training on organic farming practices? Yes / No.

If yes, mention the areas for training.

S.No.	Subject Matter	
1.	Farmyard manuring	
2.	Biogas slurry	
3.	Vermi compost	
4.	Sugarcane trash compost	
5.	Coir pith compost	
6.	Biofertilizers	
7.	Pressmud	
8.	Bonemeal / fishmeal	
9.	Oilcakes	
10.	Biopesticides	
11.	Biocontrol agents	
12.	Others, please specify	

B. Identification of Training methods

Which of the following training methods do you prefer for getting yourself trained?

S.No.	Method of training	
1.	Lecture	
2.	Discussion	
3.	Demonstration / Hands on experience	
4.	Field visit	
5.	Exhibition	
6.	Study tour	
7.	Video lessons	
8.	Slides	
9.	OHPs	
10.	Participatory training	

C. Give your suggestions to make the training programmes more effective than now.

Part V – Advantages and constraints in adoption of organic farming practices

Based on your experience, please mention the Advantages and constraints in adoption of organic farming practices.

S.No.	Advantages	Rank
1.	Conservation of natural resources	
2.	Prevention of damage to environment	
3.	Production of clean foods	
4.	Reduction of entry of toxicants in the food chain	
5.	Prospects of export of organically produced foods	
6.	Sustaining production system dependent largely on on-farm resources	
7.	Prevent soil erosion and degradation	
8.	Reduction in pollution of water bodies	
9.	Green manures acts as organic amendments	
10.	Increase micronutrient availability in soil except molybdenum	
11.	Others if any,specify	

S.No.	Constraints	Rank
1.	Cost factor in getting vermicompost,biofertilizers, oil cakes etc.,from outside places	
2.	Bringing green manures (twigs) from far off place involves time and labour cost (<i>insitu</i> cost)	
3.	Lack of packages for identifying organically grown crops	
4.	Required green manure seeds are not available in time	
5.	Organic farming is a slow process	
6.	Vermicomposting require more of water for its preparation	
7.	Lack of knowledge on few organic farming practices viz., Integrated nutrient management practices and biological control of pests and diseases	
8.	Venue of training was far off places	
9.	Azolla is available only during rainy seasons (Oct-Nov)	
10.	Others if any,specify	

Part V – Give your suggestions to overcome constraints in adoption of organic farming practices

- 1.
- 2.
- 3.
- 4.

INTERVIEW SCHEDULE

ORGANIC FARMING IN TAMIL NADU: A MULTIDIMENSIONAL ANALYSIS

Part – I

Village

Taluk

1. Farmer's Name :
2. Age : ----- (years)
3. Educational status : Illiterate / functionally literate / Primary / Middle /
Secondary / Collegiate
4. Occupational status : Agriculture – primary / secondary
5. Farming Experience (years) :
6. Farm size (acres) :
7. Social participation : *Membership:* No/in one organization/ >one organization
Office bearer: in one organization/ >one organization
8. Sources of information : 1. Radio / Television / Newspapers / Magazines
2. Fellow farmers / Friends / Relatives / Neighbours /
Village leaders
3. Research scientists / Agricultural dept. officials
4. Dealers / Seed agency / Exhibition / Adaptive trials /
Demonstrations / Others

Part II – Awareness and Adoption of Organic Farming Practices in Sugarcane

S.No.	Organic Farming Practices	Awareness		Adoption	
		Aware	Not aware	Adopted	Not adopted
I	Soil fertility management				
a)	Organic manures				
1.	Application of Farm yard manure(FYM)				
2.	Application of Biogas slurry				
3.	Application of green manures				
b)	Composts				
4.	Application of Vermicompost				
5.	Application of Sugarcane trash compost				
6.	Application of Coir pith compost				
7.	Application of Weed compost				
8.	Application of Crop residue compost				
c)	Bio fertilizers				
9.	Application of <i>Azospirillum</i>				
10.	Application of <i>Phosphobacteria</i>				
11.	Application of <i>Pseudomonas fluorescens</i>				
d)	Other wastes as manures				
12.	Application of sewage waste				
13.	Application of Pressmud				
14.	Application of Bone meal / fish meal				
15.	Application of neem/castor oil cakes				
16.	Application of spent wash				
II	Pest & Disease Management				
e)	Biopesticides				
17.	Application of Neem oil 3%				
18.	Application of Neem seed kernel extract 5%				
f)	Bio control agents				
19.	Release of <i>Trichogramma japonicum</i>				
20.	Application of <i>Trichoderma viridi</i>				

Part III - Knowledge on Organic Farming Practices in Sugarcane

1. Recommended quantity of Farmyard Manure (FYM) as basal application
12.5 t/ha
2. Stages of application of organic manures. **Sett treatment / soil application / both**
3. Recommended dose for application of Green manures **6.25 t/ha**
4. Recommended dose for pressmud application **10 t/ha**
5. Recommended dose of vermicompost **one t/ha**
6. Time interval for application of vermicompost **once in two years**
7. Quantity of *Azospirillum* / *Phosphobacteria* recommended for
 - i) soil application **10 packets / ha**
 - ii) Sett treatment **3 packets / ha**
8. Recommended dose for *Pseudomonas florescens* **one Kg/ha**
9. Dosage of neem oil 3% **15 lit/ha**
10. Dosage of neem seed kernel extract 5% **25 Kg/ha**
11. Recommended dosage for sett treatment of *Trichoderma viridii* **one Kg/ha**
12. Recommended dose of release of bio control agents. **1.5 cc /release**
13. *Tichogramma* controls **Internode borer**

Part IV – Training Needs on Organic Farming Practices

A. Do you require training on organic farming practices? Yes / No.

If yes, mention the areas for training.

S.No.	Activities/Subject matter	
1.	Farm yard manuring	
2.	Enriched farm yard manure	
3.	Biogas slurry	
4.	Vermi compost	
5.	Sugarcane trash compost	
6.	Coir pith compost	
7.	Biofertilizers	
8.	Pressmud	
9.	Bonemeal / fishmeal	
10.	Oilcakes	
11.	Biopesticides	
12.	Biocontrol agents	
13.	Others, please specify	

B. Identification of Training methods

Which of the following training methods do you prefer for getting yourself trained?

S.No.	Method of training	
1.	Lecture	
2.	Discussion	
3.	Demonstration / Hands on experience	
4.	Field visit	
5.	Exhibition	
6.	Study tour	
7.	Video lessons	
8.	Slides	
9.	OHPs	
10.	Participatory training	

C. Give your suggestions to make the training programmes more effective than now.

Part V – Advantages and constraints in adoption of organic farming practices

* Based on your experience, please mention the Advantages and constraints in adoption of organic farming practices.

S.No.	Advantages	Rank
1.	Conservation of natural resources	
2.	Prevention of damage to environment	
3.	Production of clean foods	
4.	Reduction of entry of toxicants in the food chain	
5.	Prospects of export of organically produced foods	
6.	Sustaining production system dependent largely on on-farm resources	
7.	Prevent soil erosion and degradation	
8.	Reduction in pollution of water bodies	
9.	Green manures acts as organic amendments	
10.	Increase micronutrient availability in soil except molybdenum	
11.	Others if any,specify	

S.No.	Constraints	Rank
1.	Cost factor in getting vermicompost,biofertilizers, oil cakes etc., from outside places	
2.	Bringing green manures (twigs) from far off place involves time and labour cost (<i>insitu</i> cost)	
3.	Lack of packages for identifying organically grown crops	
4.	Required green manure seeds are not available in time	
5.	Organic farming is a slow process	
6.	Vermicomposting require more of water for its preparation	
7.	Lack of knowledge on few organic farming practices viz., Integrated nutrient management practices and biological control of pests and diseases	
8.	Venue of training was far off places	
9.	Azolla is available only during rainy seasons (Oct-Nov)	
10.	Others if any,specify	

Part V – Give your suggestions to overcome constraints in adoption of organic farming practices

- 1.
- 2.
- 3.
- 4.