An Analysis of Farmers Field Schools In Karnataka Community Based Tank Management Project

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An Analysis of Farmers Field Schools in Karnataka Community Based Tank Management Project

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Affectionately Dedicated To

My Beloved Parents

&

My Revered Guide

University of Agricultural Sciences, Bangalore

Department of Agricultural Extension

Certificate

This is to certify that the thesis entitled **An Analysis of Farmers Field Schools in Karnataka Community Based Tank Management Project** submitted by **Mr. R. Suresha**, for the degree of **Master of Science (Agriculture)** in **Agricultural Extension** of the University of Agricultural Sciences, Bangalore, is a record of research work carried-out by him during the period of his study in this University under my guidance and supervision and the thesis has not previously formed the basis of the award of any other degree, diploma, associateship, fellowship or other similar titles.

Bangalore
January, 2005

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Introduction

I. INTRODUCTION

Karnataka is dotted by 36,672 tanks with a potential command area of 6,85,000 ha. But, the actual area irrigated by these tanks have shown constantly declining trend with current irrigation at 2,40,000 ha. This accounts for only 35 per cent of the potential area. In spite of the fact that the decline of tank irrigated area is a common phenomenon through out the country, for Karnataka, it assumes greater significance. While the national average irrigated area is about 32 per cent, Karnataka has only 20 per cent of its net cropped area under irrigation. The problem is compounded by the fact that 54 per cent of the geographical area of the state is drought-prone compared to only 16 per cent in the country. The reasons for the decline in tank command area and poor management of its structure is due to social, economic and institutional factors. Important social factors are; (a) siltation and encroachment of tanks, and the neglect by the local communities and by the authorities located at a distance, (b) water extraction by those owning tube wells, and (c) overall decline of the community interests in maintaining the tanks. The economic factors are; (a) heavy subsidies in power supply for irrigation pumpsets, and (b) inadequate or no financial allocation for operation and maintenance of tank projects. The institutional factors are; (a) control and administration of tanks has moved from village to a distant place, (b) shift of authority from the visible local community to the invisible government, and (c) state's shift in emphasis on major and medium irrigation.

Recognizing the reasons for the neglect and degradation of tank systems in Karnataka, Government of Karnataka (GoK) has taken measures to enhance the access of farmers and other users to tank systems. As an evolving strategy of initiating a process of reforms in tank management, GoK has taken a decision to transfer management of tanks to communities in a phased manner. To facilitate this process, GoK created Jala Samvardhane Yojana Sangha (JSYS) as an autonomous and independent society with major objectives of; (a) developing, conserving and strengthening water sector through participatory system in tanks and ground water to improve livelihoods of rural people, (b) facilitating community driven approach

from project preparation to its implementation, (c) promoting an undertaking effort to integrate interventions and operational convergence in related sectors viz., agriculture, horticulture, sericulture, forestry, animal husbandry, fisheries, ground water management, watershed development etc., (d) planning and organizing capacity building and other activities, and (e) developing guidelines for planning, implementation, monitoring and evaluation.

Government of Karnataka with the financial support from World Bank, launched tank systems improvement programme entitled Karnataka Community Based Tank Management Project (KCBTMP) during July 2002. The project proposes to cover 2000 tanks (out of 36,672 tanks in Karnataka) with an estimated command area of 72,000 ha over a period of seven years. These tanks are distributed in the districts of Kolar (1024 tanks), Tumkur (397 tanks), Chitradurga (72 tanks), Haveri (228 tanks), Raichur (158 tanks), Bellary (53 tanks), Bagalkot (26 tanks), Bidar (26 tanks) and Koppal (21 tanks). The project development objective is to improve rural livelihoods and reduce poverty by developing and strengthening community-based approaches through proper managing of selected tank systems. To achieve this, the project has three components viz. (a) establishing an enabling environment for the sustainable, decentralized management of tank systems; (b) strengthening community-based institutions to assume responsibility for tank system development and management, and (c) undertaking tank systems improvements, which will include (i) improving the operational performance of selected tank systems through a menu of physical interventions identified and executed by local users; and (ii) facilitating technical training and on-farm demonstrations in water management, agricultural and horticultural development, fisheries, forestry and fodder production, to help and ensure that improved water storage and efficiency is translated into increased household incomes.

The University of Agricultural Sciences, Bangalore has entered into an agreement with JSYS - a nodal agency of the GoK, on 15.11.2002 to render consultancy services to implement the subcomponent of the KCBTMP - Tank systems improvements - production systems development in the eastern and central dry zones of Karnataka

covering 1,500 tanks in Kolar, Tumkur and Chitradurga districts, out of 2,000 tanks in the project. The major objectives of the sub-component are (i) to improve productivity and production of on-farm systems involving crops and livestock agriculture to increase farmer's income, (ii) to establish income generating activities for those in the catchment areas especially the landless, and (iii) to develop new technologies to identify and optimize other opportunities for diversification and intensification of production systems. The duration of the consultancy assignment undertaken by the University is five and half years. During this period, the University is expected to carryout four major activities viz. (a) on-farm demonstrations on water management, arable crops and horticulture crops, (b) training and capacity building through technical training to project stakeholders, implementation of Farmers Field School (FFS), organizing study tours and workshops, (c) technical assistance to income generating activities in respect of livestock development through forage production and milk production enterprises, and (d) technology development through pilot projects on application of on demand water delivery technology and efficient irrigation methods; effect of tank rehabilitation on ground water and its implications on the conjunctive use and management of tank irrigation and reservoir siltation and de-siltation techniques.

To carryout these activities, the University has established an exclusive consultancy services units at University level, district level and cluster level (a group of 25 tanks). At the University level, Programme Coordinator and a team of specialists will plan the activities, guide the staff at district and field level, monitor the implementation process and liaise with JSYS. At the district level, the District Coordinators and Specialists will guide and support the field staff in implementation of agreed activities and maintain close contacts with district level staff of JSYS and other development departments to converge the activities in the project area. At the cluster level, one Research Associate and two Field Technicians will implement the field level activities and they work closely with Cluster Facilitation Team (CFT) specialists (CFT is an NGO assigned with the task of social mobilization and institutional building at the tank level).

Statement of the problem

Among several activities leading to enhanced agricultural and horticultural development in the project area, Farmers Field School occupies a significant place. Farmers Field Schools have to be organized in all the 2000 tanks selected for rehabilitation work in the project districts covering 60,000 farmers and farm women during the project period in a phased manner.

Farmers Field School was considered as an effective and comprehensive non-formal educational method to teach and technically empower adult farmers and farm women in KCBTMP. Farmers as adult learners, have unique advantages as well as some particular handicaps. They have some specific needs to be met for which they are willing to make purposeful efforts. Adults have certain advantages, they are mature persons. Their approach to life and events is likely to be better balanced and more rational. They can evaluate better and integrate their learning with past experience more easily. Once they are interested in something, convinced of its usefulness and gain self-confidence, they become as good learners as anybody else. At the same time, it is common knowledge that the learning ability declines with age. As age advances caution grows, complacency increases and fear of failures become stronger. The faculties of vision, hearing and reaction time tend to slow down. Feelings of insecurity, anxiety and fatigue tend to rise. All these may contribute to a disinclination of the adults to attempt learning.

It is generally considered that the ability to learn does not entirely depend upon age, as much as it does on individual's capacity, interest, energy, time and habit of learning. It is also considered possible to adjust the adult learning situations in such a manner as to overcome some of the handicaps of adults as learners. Thus, there is a general agreement that age as such, may not constitute a formidable barrier to adult learning performance.

Adult farmers put forth efforts to learn if such learning appears to satisfy their basic needs. These needs, wants, desires, motives or urges may be broadly categorized as follows:

- The desire for security : it may be economic, social, psychological or spiritual
- The desire for new experience : It includes new ideas, new ways, new interests, new things and the like
- The desire for affection : A sense of friendship, belongingness, companionship or fellowship are of the kind
- The desire for recognition : Prestige, status, unique achievement and admiration are in this category.

Considering the adult learners strengths and weaknesses, Farmers Field School as a non-formal education and a learner centered educational process was designed to make them to learn and technically empower by creating a strong desire for learning, to solve their problems by setting clear goals, stimulating their thinking to solve the identified problem, creating situation to put forth efforts to learn by themselves, to solve the problem by testing the identified solution and thus, made to derive satisfaction in their learning process by avoiding situations which frustrate them. Important theories which support the relevance of FFS in technically empowering adult learners (farmers and farm women) are summarized in the following table.

Theories which support the importance of Farmers Field School in teaching adults

Sl. No.	*Principle / Theory & the stage of FFS*	*Effect on FFS participants*
Planning stage		
1	Maslow (1954) - In a natural setup, individuals compete themselves to climb from lower order physiological needs to self actualization needs	Encourages farmers to enrol as participants/ collaborator in FFS. Genuine participation is ensured.
2	Congruity Theory by Brown (1965) - Motivation for self directed change comes from the dissonance between one's current self image and one's ideal self image.	Motivation for the farmers to enrol as participants/ learners.
3	n-Ach (Achievement Motivation Theory) -To attain inner feeling of personal accomplishment, not for the sake of social recognition/prestige.	Motivation for the farmers to enrol as learners.

Sl. No.	*Principle / Theory & the stage of FFS*	*Effect on FFS participants*
Execution stage		
4	Theory of Association - Interrelated practices are learnt faster by learners.	Learning takes place in a systematic manner among the members of the group
5	Commitment to activism by Learner (1981) – Passive acquiescence towards innovations from the outside but also a vigorous sense of initiative from within oneself to activate new ways, which is usually referred to as innovativeness.	Provide opportunity to an individual to become innovative.
6	Gestalt's Theory - There are wholes, the behaviour of which is not determined by that of their individual elements, but where the part- processes are themselves determined by the intrinsic nature of the whole.	Provides an opportunity to an individual to understand importance and effect of sub activities in the main activity. Cumulative effect of each activity can be tracked.
7	Seeing is believing, learning by doing.	Provides opportunity to practice skills. Psychomotor domain is activated.
8	Internal Group Dynamics – The forces operate within a group towards a favourable effect.	Behaviour of an individual in the group is moulded and help to sustain group action.
9	Principle of frequency by Watson (1919) Frequently performed acts, habits or responses learnt better than those infrequently practiced	The participants will have enough scope for frequent practice of different operations during FFS. Thus, practice makes perfect
10	Trial and Error Method by Thorndike (1898) - Individuals learn by themselves through repeated trials	Learning is a result of reward which comes from success after trial-and-error
Follow up stage		
11	Dissonance Theory by Fistinger (1957) – Due to accumulation of information in the individual a dissonance state is created and in order to maintain homeo statis, the individual will be motivated to adopt technologies	Internal pressure is created among FFS trainee to adopt what has been learnt in FFS.

Sl. No.	*Principle / Theory & the stage of FFS*	*Effect on FFS participants*
12	Cancian Theory by Cancian (1972) - People are rank seeking creatures, whose social status is high would like to maintain their rank in the society.	Ensures continued adoption of technologies learnt in FFS.
13	Instincts of imitation by Tarde (1969) - An individual learn things by imitation of others.	Promote urge in neighbours to adopt what has been adopted by FFS participants/ collaborator
14	Conditional Learning by Pavalov	FFS participants will be conditioned to conduct experiments when they observe new problem

Owing to these strengths in FFS, large number of farmers and farm women were considered to be covered under FFS within the project period. UAS, Bangalore alone has to cover 1200, 6000, 12,000, 15,600 and 9,600 participants during 2003-04, 2004-05, 2005-06, 2006-07 and 2007-08 respectively. Inspite of FFS being an effective method in teaching adult learners, it is also risky approach as it is a new one. With a view to improve the implementation process and to create better impact among the farmers, it is essential to constantly monitor the implementation process and to suggest suitable changes if required. Hence, this study has been conceived with the following specific objectives.

i) To analyse Farmers Field School implementation process followed in KCBTMP

ii) To assess the impact of FFS on collaborators and participants in KCBTMP

iii) To find out the relationship between impact of FFS on farmers and the independent variables in KCBTMP, and

iv) To identify the problems in implementation of FFS in KCBTMP.

Scope of the study

Present study attempts to analyse the implementation process of FFS in a World Bank funded Project, at the initial stage of the Project work. Also, the impact of Farmers Field School on intended audience as well as problems observed in implementation of FFS. The present study therefore would throw light on:

- planning and execution processes followed in implementation of FFS
- extent of involvement of stakeholders at different stages of implementation
- economic analysis of FFS
- impact of FFS in increasing knowledge and influencing on symbolic adoption behaviour
- relationship of personal, situational and extension variables on FFS participants knowledge level and symbolic adoption
- problems observed in implementation of FFS and required changes to improve the efficacy of FFS.

These outcomes of the study, would help the staff of Community Based Tank Management Project Consultancy Services Unit, in the University of Agricultural Sciences, Bangalore and concerned staff in Jala Samvardhane Yojana Sangha of Government of Karnataka, to understand the status of FFS in KCBTMP and to formulate suitable strategies, to further improve the effect of FFS on intended farmers leading to enhanced productivity of tank commands.

Limitations of the study

Due to the limitation of time and resources of the student researcher, the study was confined to only ex-post-facto research design. It would have been more appropriate if before-after research design was also followed to know the impact of FFS on the required categories of respondents. Also, only FFS participants and collaborators were considered to know the impact of FFS, no parallel comparisons were made with non FFS participants to know the differential levels of knowledge and symbolic adoption.

Definition of terms used in the study

Participants	:	Are those farmers or farm women who took part as learners in the Farmers Field School.
Collaborator	:	Is a farmer or farm women who have spared the land, irrigation and other requirements to conduct studies as part of FFS.
Facilitator	:	A technical person, who is responsible for implementation of FFS.

Tank User Group (TUG)	:	A general body with all village residents associated with tank. Among TUGs, Tank Users Committee (TUC) will be formed, which is a management body.
FFS session	:	An activity carried out by both participants and collaborators with facilitation by a technical person at the experimental site. The session duration will be from 4 to 5 hours.
Field Day	:	Is an event organised to educate and motivate large number of potential farmers, when the worth of the new technology tested is clearly visible and significant.

For other terms used in the thesis, meanings or operational definitions have been given at appropriate places.

Presentation of the Study

The first chapter deals with the introduction, wherein the objectives of the study are presented. It also throws light on the scope and limitations of the study.

The second chapter viz., review of literature, deals with the review of available and related studies in the field of the present study.

The third chapter presents the methodology adopted for the study. The location of the study area, sampling procedure followed and quantification of the variables selected for the study, statistical tests employed etc., are dealt in this chapter.

The fourth chapter contains the results of the study, followed by the fifth chapter viz., discussion, in which the results of the study are discussed.

The sixth chapter summarizes the findings of the study with a brief resume and implication of the findings.

The last chapter indicates the references and appendices.

Review of Literature

II. REVIEW OF LITERATURE

Considering the objectives of the study, available literature has been reviewed and presented under the following headings.

2.1 Concept of FFS

2.2 Subjects covered in FFS

2.3 Process followed in implementation of FFS

2.4 Impact of FFS

2.5 Relationship between selected variables and impact of FFS

2.1. Concept of FFS

Farmers Field Schools are defined differently by different authors or practitioners. To understand the concept of FFS in comprehensive way, available concepts/meanings/definitions/understanding of FFS are reviewed and presented in the succeeding paragraphs of this section.

Gallagher (2003), in his study on Integrated Pest Management (IPM) FFS in Indonesia, defined "Farmers Field School consists of group of people with a common interest, who get together on a regular basis to study how and why of a particular topic". He further described that FFS are comparable to programmes such as study circles, religious studies at a church, mosque or temple or specialized study programmes for any skill, adopted particularly for field study, where specific hands on management skills and conceptual understanding is required. The essential elements of FFS as stated by Gallagher are:

FFS participants : A group of farmers with a common interest.

Facilitator : A technically competent person to facilitate or lead the group. It may be an extension worker or FFS graduate (alumni).

The field : The field is the learning centre. It serves as teacher, provides most of the training materials like plants, pests and real problems.

The curriculum : The FFS curriculum follows the natural cycle of its subject. The cycle may be seed to seed or egg to egg.

Sessions : FFS will have regular sessions at weekly or fortnightly or monthly intervals up to the end of natural cycle depending on the nature of technology to be learnt. Each session will last for 4-5 hours.

Kumar (2003), in his study on cotton IPM FFS in Karnataka, operationalised "FFS as the schools for the farmers outside the classrooms and on the farms. It operates within the principles of the non-formal education and most of the sessions and contents are based on the adult learning principles". He further stated that FFS are season long crop and field based training based on pre identified problems and curriculums; assist each participating farmer to get deeper insights regarding their crop eco-system through individual evaluation; assist farmers in discovering knowledge and also on the methodology as to how to learn more regarding a problem and develops capacity in farmers to disseminate the technologies.

Nagaraja (2003), has operationalised "Farmers Field School as non-formal learner centered educational process. It seeks to empower people to solve their field problems actively by fostering participation, interaction, dialogue, joint decision making, self confidence and self determination. Farmers learn by carrying out for themselves various activities related to a selected farming technology and through constant observation of the technology performance in the field". He stated that there are three types of actors involved in FFS viz.; (a) participants or the farmers willing to learn, (b) collaborator a farmer who gives land for conducting FFS and (c) the facilitator who designs and organizes FFS. To achieve desirable results in FFS, the facilitator / extension worker plays a significant role. He or she should be skilful in technical, social, communication and organizational aspects.

The study in Indonesia by Thijssen (2003), operationalised "FFS as it is a method to fill gaps in local knowledge, conduct holistic research on agro-eco systems, and increase awareness and understanding of phenomena that are not obvious or easily observable". It was further opined that the basic concepts of FFS and Participatory Technology Development (PTD) approaches are complementary, and the FFS approach provides fertile ground for PTD. In order to fill the basic knowledge gaps

that still exist, PTD groups can borrow from the FFS principle of educating farmers on agro-ecological components, patterns and processes. Inturn, FFS should pay more attention to revising the attitudes of agricultural development professionals to enable them to become more involved in PTD work.

Vijayalakshmi *et al.* (2003), while conducting a study on learning process of FFS in Tamil Nadu, stated that the "FFS is a tool to build capacities of farmers groups and non governmental organization (NGO) staff in managing crop eco-system and to make them better decision makers in promoting sustainable use of resources at the cropping, farming and watershed system levels". Further, they stated that FFS is a participatory approach, wherein training is imparted on the basis of farmers needs. Once the need is identified, season long practical training is imparted emphasizing learning through discovery. Training is provided in the farmers field itself, which enables better understanding of the field problems, their management and control. During the training, a holistic understanding of the agro-eco-system is facilitated among farmers.

Onduru *et al.* (2003), while conducting a study on Integrated Nutrient Management (INM) FFS in Eastern Kenya, stated that "the INM-FFS is a forum for strengthening linkages between farmers and other consortium partners with experience, skills and information on soil fertility management. The experience of joint learning and effective exchange of information in the FFS create a sense of ownership amongst farmers to encourage them to put their newly acquired INM skills into practice". The farmers learn through the process of Agro-Eco-System Analysis (AESA) and field experiments. It was further stated by the author that it is a discovery-based learning method using field observations, discussions and analysis, sharing results among different groups and making appropriate decisions to manage their crops better.

Poloyech (2003), in Combodia, used the term Farmers Life Schools (FLS) which is similar to FFS. It was described as "non-formal experimental learning process consists group of about 20-25 farmers who meet somewhere in the village, once a

week for 18 weeks. The farmers learn through the process of agro-eco-system analysis and field experiments". It was further stated by the author that it is a discovery-based learning method using field observations, discussions and analysis, sharing results among different groups and making appropriate decisions to manage their crops better.

Singh (2003), in his study on Farmers Forest Management Schools (FFMS) in Nepal stated that "Farmers Forest Management Schools are fora for group learning. They bring farmers and forest management practices together to explore ways of combining the principles of forestry science and technology with local community experience and knowledge. With these insights, FFMS can facilitate a process of negotiation that can result in new plans and principles of forest management". The FFMS aims to add value to community forestry practices by developing ways of managing the forest to ensure that, it yields substantial benefits to its users.

From the foregoing reviews, it can be summarized that FFS is a non formal educational activity, where a group of farmers with common interest will meet at regular intervals in the field up to the end of crop season (life cycle) and they learn to solve the problems by themselves with the facilitation from the experts in the subject.

2.2. Subjects covered in FFS

The FFS have been used for a variety of subjects and situations. To understand the versatility of FFS, the literature available has been presented below.

Gallagher (2003), stated that the topics covered in FFS were Integrated Pest Management, organic agriculture, animal husbandry, soil husbandry and income generating activities such as handicrafts.

In Egypt, Vandepol (2003), stated that farmers need education on IPM in relation to more than one crop. Therefore, the FFSs were started to deal with more crops and crop rotations simultaneously. The crops covered were cucumber, tomato, citrus, mango and cotton. Further it was stated by the researcher that to do this, the total

length of an FFS was extended to one full year. This gives the facilitators, the possibility to include all crops, pests, soil and water management practices in the curriculum of the FFS. The broadening of FFS curriculum has made the FFS a more complete tool in agricultural extension.

According to Kumar (2003), the topics in FFS are linked to crop stages and or to specific local problems. This has to be decided by the facilitators during the initial stages of the FFS. Topics covered in FFS include pest management, disease management, nutrient management, water management, marketing, post harvest, crop physiology, health and safety, and economic analysis. With respect to activities are concerned, he opined that the FFS can cover the activities like problem solving, communication, leadership, team building and strengthening group cohesion and organizational skills.

Fakih (2003), while studying on gender field schools in Indonesia opined that, a gender-training curriculum was set up using the FFS approach, to introduce and explore the concept of gender inequality in rural communities. Further it was stated that the curriculum focused on the actual incidences of gender injustice and sought to inventories the social and political factors underlying gender inequality.

According to Mangan and Mangan (2003), Farmer Field Schools were developed in Indonesia for Integrated Pest Management in five tree crops viz., cashew, cocoa, coffee, pepper and tea. Further they opined that, applying the FFS approach to IPM for perennial tree crops required several adaptations, including changes in content, duration and methods employed specially in agro-ecosystem analysis.

Currently, over 1000 Farmer Field Schools on livestock, IPM and integrated soil management are being successfully implemented in Kenya and many more in Africa as a whole. (Minjauw *et al.* 2003).

Minjauw *et al.* 2003, in kenya considered dairy animal feeding strategies, fodder development, calf rearing, disease management, water management and breeding as subject of FFS for dairy farmers.

Poloyech (2003), in Farmer Life Schools to tackle the rapid spread of HIV/AIDS, and increasing vulnerability of the rural population to chronic illnesses, the UNDP South-east Asian HIV programme included the relevant subjects to reduce the rapid spread of diseases. This was based on the learning principles and process followed in IPM FFS introduced by Food and Agriculture Organization (FAO). The adaptation of principles and process has been yielding good results.

Reddy (2003), opined that the subjects in FFS can be agricultural technologies, health, education, food habits, life styles and financial resource management. The villagers can learn more easily and effectively on the above subjects through FFS approach.

Vijayalakshmi *et al.* (2003), have reported that the FFS was initiated with a single crop for entire season. Gradually, it was found difficult to sustain attention and participation of the farmers owing to their diverse needs. Therefore, the focus of FFS was shifted from single crop approach to farming systems approach covering, enhancing organic matter, vermi-composting, on farm biomass generation through tree planting etc. in Tamil Nadu.

From the aforesaid reviews, it could be inferred that FFS can be employed to a variety of subjects viz.; integrated crop management approaches in annual and perennial crops, conservation of natural resources, organic farming, animal husbandry, household production systems, health, education, finance management, gender related subjects etc.

2.3. Process followed in implementation of FFS

The procedure followed by different practitioners of FFS has been reviewed and presented below for its apt usage in the study.

According to Gallagher (2003), the basic format of an IPM FFS consists of three activities namely agro-ecosystem observation, analysis, and presentation of results. The agro-eco system analysis is the FFSs core activity and other activities are

designed to support it. A typical FFS session in the original Indonesian setting will last for about four and half hours in the morning. The breakup has been as follows:

8.00 am : Opening (often with prayer) attendance call, day's briefing of activities, stretching exercises.

8.30 am : Go to the field in small teams, make observations that are noted by the facilitator and one other person in the group records the observations. Facilitator points out interesting new developments.

9.30 am : Return to shade. Begin making AESA, drawing and discuss management decisions.

10.15 am : Each team presents results and the group arrives at a consensus on management needs for the coming week.

11.00 am : Short tea/coffee/water break.

11.15 am : Energizer or group building exercise.

11.30 am : Special study topic or second crop / livestock study. This could include nutrition, or chicken or parasites, or something else of special interest to group.

12.30 pm : Closing (often with prayer).

Groenweg and Tatur (2003), in their study on FFS in rural areas of Peru stated that in conduct of FFS, two main activities are common to all FFS. The first and most significant activity is agro-ecosystem analysis. This is based on a series of field and crop observations carried out during the whole cropping season by the farmers and farm women. They are trained in various AESA tools, which enable them to make informed decisions on crop management. The second activity is integrated evaluation approach which is also called as "ballot box test", an exercise involving tests that measure farmers understanding and abilities before and after an FFS training season. This is usually based on relevant, practical agro-ecology such as crop growth strategies, weeds, insect pests, the damage they cause and their natural enemies.

Kumar (2003), stated that an FFS session last for about 5 hours. In each session, AESA, decision making special topics/ group dynamics as well as review and planning will be carried out. Out of which, agro-ecosystem analysis is the core in the FFS. Each team uses their field samples and notes, to create visual analysis, combining key factors such as pests, predators' population, plant health, field conditions, weather and current management treatments. He further stated that decision making and group dynamics, topics, review and planning are also important. The output of analysis is a set of field management decisions discussed thoroughly in small groups and defended in open discussion in the presence of all the participants. The group dynamic activities in problem solving, communication, leadership and team building are conducted every week to strengthen group cohesion and to help participants to develop organizational skills.

Minjauw *et al.* (2003) in their study on field schools for Kenyan dairy farmers to teach skills considered record keeping and accurate observations as important components of FFS. Agro eco-system analysis was designed to improve observation skills, and to develop decision making skills, and this technique was utilized to record and observe the results of the experiments. This observation process formed the basis for understanding the interaction between livestock and other elements of the eco-system. The farmers were divided into small groups and they observed animals. A check list was provided to each small group to serve as a guide for observations. Each group presented their observational findings to rest of the school participants. The findings were discussed and allowed to happen farmer-to-farmer communication and evaluation.

Nagaraja (2003) has stated that for effective implementation of FFS, nine steps have to be followed viz. (1) collection of basic information from the development departments on the existing problems; (2) sensitizing the villagers about the need for conducting of FFS; (3) selection of participants and collaborators; (4) development of norms about punctuality, discipline etc; (5) approval in village assembly (Gramasabha) for selected participants, collaborator and norms developed; (6) planning (which include (a) problem analysis and identification, (b) selection of

technologies to solve problem, (c) deciding treatments, (d) observation to be taken, (e) frequency and duration of sessions and (f) preparation of calendar of operations); (7) developing of memorandum of understanding indicating the commitments of each actor in FFS; (8) Execution of FFS, (which includes (a) carrying out field activities as per calendar of operations, (b) conducting sessions for about 4½ hours (the breakup for 4½ hours will be recap for 15 minutes; agenda setting for the day's activity for 30 min., agro-eco system analysis by sub groups for 90 min., processing and writing AESA report for 30 min., group exercises for 30 min., presentation of sub groups findings on AESA for 30 min., decision making on the AESA observations and presentation for 30 min. and revision 15 min.), (c) organizing field days including yield estimation and (9) withdrawal, it is conditioning the participants on phasing out of the activity, listing type of support required by the FFS participants from the facilitator in the ensuring season for large scale adoption of the technology learnt in FFS.

Singh (2003), in his study on FFS on Forest Management in Nepal, revealed that, during the process of implementation of FFS, facilitators must have enough institutional and organizational support to enable them to work consistently and effectively. Fundamental issues such as appropriate follow-up-training and making forest officials more aware of procedures in implementation of FFS. Further, constraints of time and finance that can inhibit facilitator effectiveness have to be removed. Also, the policy, legislative environment and current practices including procedure for drawing up and ensuring compliance with operational plans must all be taken into account when new approaches are being negotiated.

Vijayalakshmi *et al.* (2003) have stated that the stakeholders involved in conduct of FFS in Tamil Nadu were the staff of Department of Agriculture (DoA), Central IPM Centre, NGO's and Farmers. The specific roles and responsibilities of each stakeholder have to be made known. Further, implementation stages viz., planning, execution and evaluation have to be taught to them. The AESA to be known clearly by them and it occupies a prime role in FFS.

From the preceding studies, it could be summarized that, the effect of FFS depend on how well it is being implemented. In the process of implementation, following stages were felt important.

- The topic for FFS should be based on the existing problems of the people.
- The solutions for solving problems have to be selected by the participants and the same has to be tested in the farmers' field to see the effect of selected technologies.
- The number and duration/length of sessions have to be decided jointly by participants and facilitators based on the technologies to be tested.
- Each session should be organized for about 4 to 4½ hours. During each session, agro-eco system analysis has to be conducted systematically to draw meaningful conclusions.
- The collaborator and participants have to be divided into sub groups for effective participation and quality decision making during sessions.
- The facilitator's skilfulness in organizing FFS is very important. Hence, the facilitator selected has to be trained in planning, organizing and follow-up stages.
- The facilitators have to consider follow-up work on important activities to achieve spread effect of the technology identified in subsequent seasons.

2.4. Impact of FFS

The utility or impact or the behaviour al changes observed among the participants of FFS have been given below.

Krishnamurthy and Veerabhadraiah (1999), in the study FFS on IPM in Karnataka, stated that the FFS trained farmers had slightly better knowledge than the untrained farmers on almost all the IPM practices of rice cultivation.

Parthasarathi and Govind (2001), stated that the knowledge level of FFS trained farmers was much higher on biological and physical methods of IPM, identification of pests and predators' and on economic threshold levels. This shows that the FFS training on IPM had a positive effect on farmers. Therefore more such trainings need to be conducted to popularize the IPM practices among farmers.

Berg *et al.* (2002), in their study on impact of FFS training in Sri Lanka stated that the usage of insecticides and fungicides dropped to almost nil due to training in FFS, while these trained farmers sharply increase their use of organic fertilizer. IPM was associated with a yield increase of 23 per cent. The comparison of IPM and non-IPM farmers suggests a very high economic rate of return. Further, they stated that the costs of FFS training (including costs of training of trainers) were recovered seven-fold with in a single rice-growing season through increased outputs and decreased inputs.

Mangan and Mangan (2003), in their study on IPM FFS in China, opined that adjustments and changes in the FFS approach had to be made accordingly. Further, they stated that the FFS approach, of involving farmers in participatory field learning activities remained a powerful one and the impact of training was positive and effective.

In the study by Thijssen (2003), on PTD and FFS in Indonesia found that, FFS fill gaps in local knowledge by conducting holistic research on agro-ecosystem and increase awareness and understanding of phenomena that are not obvious or easily observable. Further, it was stated that in order to fill the basic knowledge gaps that exist PTD groups can borrow from the FFS principles of educating farmers on agro-ecological components, patterns and processes. In turn, FFS should pay more attention to revising the attitudes of agricultural development professionals to enable them to become more involved in PTD work.

Farmers Field Schools have been very effective in making farmers understand and gain confidence about various technologies and practices of farming. The FFS approach makes them observe and think critically while working on their own lands. Further, it was opined that FFS not only provides information on technologies, but enables working on their own lands with emphasis on action, observation, understanding, assessment and decision making. Learning by practicing is very important than learning by reading (Reddy, 2003).

The ex-post facto analysis by Minjauw *et al.* (2003), on FFS of Kenyan dairy farmers revealed that the amount of water fed to the dairy animals was changed according to the calculated need of animals, milk yields increased considerably, artificial insemination practices were adopted as per the recommendation and preventive treatment was given to the animal as prophylactic measure. This signifies that FFS had positive impact on FFS farmers.

Poloyech (2003), stated that farmers develop the ability to identify and analyze issues facing their communities, farmers become aware of the possible consequences of risk taking behaviour related to public health threats, farmers become trained and develop skills in leadership, networking, training, planning and organization, to the benefit of their communities. Further it was stated that farmers initiate activities to help their communities after the farmers learning schools. Further, it was stated that FFS on IPM are potentially an excellent entry point for a wide range of community development activities. The discovery based learning approaches applied in FFS can help farmers to gain a deep understanding of ecological concepts, as well as their practical applications. This approach to identifying problems and alternatives solutions has been developed to help understanding the agro-ecological principles under lying IPM.

Singh (2003), in his study on community forest management and FFS in Nepal, stated that during the FFS trials, non-FFS members were skeptical about the activity and while passing through FFS plots. They initially criticized FFS participants for destroying the forest in the name of their experiments, but, later they realized the value results and suggested that other trial plots should be established to investigate other aspects of forest management.

Tripathi and Shiraz (2003), carried out a study on FFS and SHGs in Terai of eastern Uttar Pradesh. They have stated that the FFS have gained popularity amongst farmers not only from the project villages but also from other neighboring villages, who have extensive practical knowledge of the topics covered. Further, they stated

that FFS are managed by the SHGs/Sangha, who also decide on the place and topics on the basis of the felt seasonal demand.

Kumar (2003), stated that in FFS not only farmers gain knowledge and skills, but their attitudes were also changed related to farm inputs, including chemicals usage and field management decisions. And his experience in one of the FFS in Raichur, Karnataka proved that farmers could save more than Rs. 1,400 per ha area by making informed decisions regarding the crop management compared to local/farmer's practice, and also with passage of time and experience of conducting FFS, trainers sharpen their interactive skills, skills for conducting sessions and converting a field problem into a learning opportunity. Thus, FFS is a two-way empowerment process, where farmers and trainers empower each other. Even the attendance rates of participants in FFS session were high.

Vijayalakshmi *et al.* (2003), have stated that, farmer group in Thirumanthurai village of Perambadur district in Tamil Nadu undertook collective marketing of cotton, which resulted in an increased amount of Rs.100 per quintal. This has encouraged other farmers who were not part of FFS also to join the FFS farmers groups in adopting the technologies. The FFS participants were successful in identifying biological methods in controlling snails menace without using chemicals in kunnam village of Tamil Nadu. Further, they stated that FFS had visible impact on women in agriculture. The capacity building process enabled them in getting due recognition in the family while taking decisions on crop management. And also, the drudgery involved in lifting water for spraying pesticides was reduced drastically as alternative control options were understood. Inter cropping remained largely the domain of women as they had the control on the income realized from it while it also influenced the nutritional security of the household.

It could be inferred from the reviews of this section that FFS is a powerful tool in enhancing the knowledge, skill and attitudes of FFS participants on the technologies considered in FFS. The returns per unit area have increased and also better marketing arrangements were identified for their produce.

2.5. Relationship between selected variables and impact of FFS

An attempt was made to relate the personal, situational, social and psychological factors of FFS participants with their acquisition levels of knowledge & skills and avert behaviour changes. Only one study was available to the researcher and the same is presented below:

Krishnamurthy (1999), in his study on IPM FFS in the districts of Mandya, Mysore, Hassan, Shimoga and Bangalore rural district, has found that education, farm size, mass media exposure, extension participation, extension agency contact, risk orientation, scientific orientation, innovative proneness were having positive and significant relationship with knowledge level of FFS participants and adoption level of IPM practices by FFS participants.

Material & Methods

III. MATERIAL AND METHODS

Material and methods used in the study have been presented in this chapter under the following headings

3.1 Research Design

Kerlinger (1973), defined research design as the plan, structure and strategy of investigation conceived to find answers to research questions and to control variance. In the present study, ex-post-facto research design was used. According to Robinson (1976), in ex-post-facto research design, there is no scope for manipulation of independent variables, as they have already occurred. It is possible to deduce theories, identify behaviour phenomena and explore conditions under which phenomenon occur. To know the FFS implementation process followed, its impact on stakeholders, relationship between dependent and independent variables and to identify problems in implementation, this design was more appropriate and hence adopted.

3.2 Variables used in the study

Keeping in view the objectives of investigation, implementation process (covering planning, implementation, participation) investment per participant, gain in knowledge and symbolic adoption were identified as dependent variables. Whereas, age, education, family size, size of land holding, irrigation potential, management orientation, innovative proneness, risk orientation, cosmopoliteness, organizational participation, contacts with extension agency and exposure to mass media of FFS participants and collaborators were considered as independent variables. The empirical measures used in the study have been presented below.

Variable	*Empirical measurement*
Dependant variables	
1 Implementation process	
1.1 Planning	Schedule developed for the study
1.2 Implementation	Schedule developed for the study
1.3 Participation	Schedule developed for the study
2 Investment/participant	Schedule developed for the study
3 Impact of FFS	
3.1 Gain in knowledge	Teacher made test developed for the study
3.2 Symbolic adoption	Scale of Surekha (1999)
Independent variables	
1 Personal variables	
1.1 Age	Schedule developed for the study
1.2 Education	Schedule developed for the study
1.3 Management orientation	Scale of Samanta (1977)
1.4 Innovative proneness	Scale of Feaster (1968)
1.5 Risk orientation	Scale of Supe (1969)
1.6 Cosmopoliteness	Scale of Desai (1981)
1.7 Organizational participation	Scale of Trivedi (1963)
2 Situational variables	
2.1 Family size	Schedule developed for the study
2.2 Size of land holding	Schedule developed for the study
2.3 Irrigation potential	Schedule developed for the study
3 Extension variables	
3.1 Contacts with extension agency	Scheduled developed for the study
3.2 Exposure to mass media	Scheduled developed for the study

3.3 Measurement of Dependent Variables

3.3.1 Implementation process

Implementation process followed in KCBTMP was measured considering the sub components a) planning b) execution, and c) participation of FFS participants and collaborators. To quantify these sub components, the procedure followed has been detailed below.

3.3.1.1 Planning

It is the degree to which, the activities intended to be performed in the process of implementation of farmer's field school have been detailed by the implementing authorities of KCBTMP. Following sub components of planning were considered.

a. Listing of problems: It is the process of listing existing agricultural related problems in the village selected for FFS. While listing the problems related to crops, the implementing staff were expected to assess the gap between actual yield obtained by farmers and taluk and district average yields. When the crop yield of the locality is less than taluk/district average, the reasons for getting lesser yield have to be assessed and documented. Then, the problems have to be listed and prioritised. This process was studied whether problems were listed or not. If listed, one score was given. Otherwise, zero score was given. If such problems were listed for major crops of that area, one score was given. Similarly, for correct source, one score was given. Thus the maximum score for this sub component was three.

b. Enlisting cooperation of Department of Agriculture (DoA) staff: It is the process of involving staff of Department of Agriculture while implementing FFS (Fig 1). Involvement was felt essential in the project, to carryout follow up activities after phasing out of KCBTMP (the UAS(B) or KCBTMP staff will work for two years only in the project villages). In view of shortage of field staff in Department of Agriculture, at least three visits were expected from them. The project staff should get their participation. The information on number of extension workers, number of visits made by them and stage of FFS was collected from the implementing staff of KCBTMP. The score of one each were given for these items if, these were according to the standards. The specified standards were, at least two extension workers, three visits and the stages were sensitization of TUG's, Field Day and presentation of yield data in Gramasabha. Thus the maximum score was three for this sub component.

c. Sensitization of Tank User Groups : It is the process of establishing need for conducting FFS (Fig 2). It is educating villagers by comparing the yield gaps, specifying the problems, emphasizing the consequential effects if the problems are not addressed timely, methods to solve problems, needed support from villagers etc. The information was collected from the facilitator to know whether participants are sensitized or not, if sensitized, was it at the right time or not. The score of one each was assigned for sensitization and time of sensitization. A total score of two were considered for this sub component.

d. Selection of FFS participants and collaborator(s): FFS participants are group of about 30 farmers or farm women, willing to be the learners or experimenters in the Farmers Field School. Whereas, collaborator is a farmer or farm women who gives land for conducting field studies as part of FFS. It can be one / more persons. Both participants and collaborators have to be selected by Tank User Group and approved by Gramasabha (Fig 3). To select these actors, a set of guidelines were developed by the CBTMPCS and the same were given to the field staff for their use while selecting the actors. Following were the guidelines or criteria.

For participants

- Willing to participate regularly (once in 10 days) through-out the crop season.
- Willing to involve actively during field school activity.
- Willing to adopt the efficient practices identified in the FFS in his/her field in subsequent season/year and continues to adopt in later years also.
- Willing to share the knowledge/skills learnt in FFS with other farmers.
- Able to read and write.
- Representation for women participants should be at least 33 per cent.

For collaborator

- Volunteer to spare his/her land
- Allow to conduct FFS study in his/her field
- Should be cooperative
- Non political
- Be available during the FFS sessions or should become one of the FFS participants.

The information was elicited on this aspect from the facilitators about number of participants selected, criteria followed, authority selected the participants and collaborators. The scoring pattern followed was as follows.

- If the FFS strength is 30, 2 score, if it is less than 30, 1 score
- If the set criteria followed for selecting participants - 3 score, if partial 2, if not at all - 1 score

- If the set criteria followed for selecting collaborators – 3 score, if it is partial- 2 score, if not – 1 score
- If the selection of participants and collaborators is by TUGs 2 score, and if selected by facilitator 1 score. The score ranged from 4 to 10.

e. Development of norms for FFS: After the selection of FFS participants and collaborators by the TUGs, the facilitator has to encourage them to evolve norms or rules and regulations on regularity, punctuality, participation, behaviour, sharing of the responsibility, etc. in consultation with TUGs. This was ascertained from the facilitators of FFS whether the norms were developed or not and who has developed those norms. The scoring pattern followed was

- If norms were developed covering all aspects-2 score, if partially - 1 score
- If developed jointly by TUG and field staff -2 score, if by facilitator alone - 1 score

f. Approval of FFS participants, collaborator and developed norms in Gramasabha: After the selection of FFS participants, collaborators and development of norms, the same has to be presented to gramasabha about norms followed, persons selected, commitments of each partner etc. for its approval in gramasabha. This will be helpful in smooth implementation of FFS. In this regard, information was obtained from the concerned, whether (a) Gramasabha was conducted or not, (b) if conducted was it at right time or not, (c) whether the proceedings were recorded in relevant documents on the decisions taken or not and (d) whether required quorum was there in gramasabha or not. One score for each item (a to d) was considered. Thus, the maximum score was four.

g. Problem analysis: Is an important step in planning process. Here, all the problems relating to command area crops were to be collected from the FFS participants as well as other villagers by the facilitators. After listing all the problems, the problems have to be prioritized based on the need by the FFS participants (Fig 4). For each of the prioritized need, the participants have to be encouraged to conduct strengths, weakness, opportunity and threats (SWOT)

analysis to identify an appropriate opportunity(ies) to convert weakness as strength and to overcome the effect of threat. This way, the problem was to be analysed in the project. The scoring pattern followed as follows.

- Problems identification : Jointly -2 score; facilitator alone -1
- Solutions identified : Jointly -2 score; facilitator alone -1
- SWOT analysis conducted : Jointly -2 score; facilitator alone -1

To know the extent of knowledge acquired by FFS participants Ballot Box Test is conducted (Fig 5).

h. Topic selection for FFS and Treatment plan: It is the subject related for testing in the field. Three topics were considered in KCBTMP. The first topic was the farmers practice. This was to serve as a check. The second topic was the one which is selected by the participants to solve the problem, which was also called as special topic need to be experimented with suitable treatments and replications, and the third topic was the improved technology with integrated crop management practices (selection of appropriate crop/variety, integrated water, nutrient, pest and weed management). Treatment plan was the plan to allocate the topics for their testing in the collaborators' land. Treatments and replications were considered for the special topic (Fig 6). However, no such replications/treatments were considered for the other two topics. An example of treatment plan adopted in the project is given in Appendix-I. The information on this aspect was collected, to know whether treatment plan was developed or not. The total score ranged from 0 to 4 on this sub-component.

The scoring pattern followed as follows

- Consideration of replication : 1 score
- Consideration of treatments : 1 score
- Consideration of ICM practices : 1 score
- Consideration of farmers practice : 1 score

Planning Phase

Fig.1 Discussion with staff of Line Dept. to identify problem & to elicit their cooperation

Fig. 2 Sensitising TUGs about the need for conducting FFS

Fig. 3 Selection of participants & collaborator in Grama Sabha

Fig. 4 PRA- Identification of problems/ solutions/treatments

Fig. 5 Ballot box test to know the extent of knowledge acquired by FFS participants

Working out planning efficiency index

The score obtained by facilitator for all the sub components of planning (a - h) were computed and planning efficiency index was worked using the procedure indicated below.

$$Planning\ efficiency\ index = \frac{Actual\ score\ obtained\ by\ facilitator\ for\ planning\ (a\ to\ h\ sub\ components)}{Possible\ score\ for\ planning\ (a\ to\ h\ sub\ components)} \times 100$$

3.3.1.2 Execution

It is the process of implementation of scheduled activities as per the plan. Here, adoption of crop production processes, sessions organized, field days organized, analysis of results and preparing the participants and collaborators for phasing out were considered.

a. Field operations: It is the implementation of crop production practices as per calendar of operations developed. The information on crop production practices followed against the calendar of operations, was obtained from facilitators and scoring followed is as follows.

- More than 75% of activities implemented as per calendar of operations - 4 score
- 50-75% of practices implemented as per calendar of operations - 3 score
- 25-50% of practices implemented as per calendar of operations - 2 score
- Less than 25% of practices implemented as per calendar of operations - 1 score

b. Sessions: Are the group learning activities conducted in the field at regular intervals. During such session, participants and collaborators with the facilitation by the KCBTMP staff carried out the following activities in five hours time. Recap, agenda setting for the day's session (Fig 7), field operations and agro eco system analysis in subgroups (5-6 persons), recording observations on growth and yield parameters (Fig 8 & 9), processing information on the observations by each subgroup (Fig 10), group dynamic exercises (Fig 11), presentation of results (Fig 12), decisions on next weeks activities and sum up.

The information on sessions conducted was collected from each facilitator and scoring pattern followed is indicated below.

Sl. No.	*Item*	*Implementation*	
		As planned	*Deviated from plan*
1.	Number of sessions conducted	2 score	1 score
2.	Duration of each session	2 score	1 score
3.	No. of subgroups formed	2 score	1 score
4.	Observations taken	2 score	1 score
5.	Implementation of decisions taken	2 score	1 score

The total score ranged from 5 to 10.

c. Field days: It is reaching larger number of potential adaptors of the technology at an impressive stage of the crop/technology or when the results are observable and significant (Fig 13, 14 & 15). The FFS participants and collaborators take the visitors to the field and explain about technology. Thus, they take lead in disseminating the technologies to the farmers attending the field day. This was to achieve farmer to farmer communication. The facilitators have recorded the names and addresses of those farmers willing to take up the technology in future and extend needed support to them in adoption of the technology.

The information collected on this subcomponent was scored as detailed below.

1. Stage of conduct of field day:
   Appropriate 1 score, if inappropriate 0 score
2. No. of farmers attended:
   If it is equal to that of FFS participants or more 1 score, if it is less 0 score
3. FFS participants involvement in explaining about technology:
   1 score, if not 0 score
4. Recorded the names of visitors willing to adopt technology:
   1 score, if not 0 score
5. Per cent farmers visited agreed to adopt technology:
   up to 10 per cent or more: 1 score, if it is less than 10 it was zero.

Implementation Phase

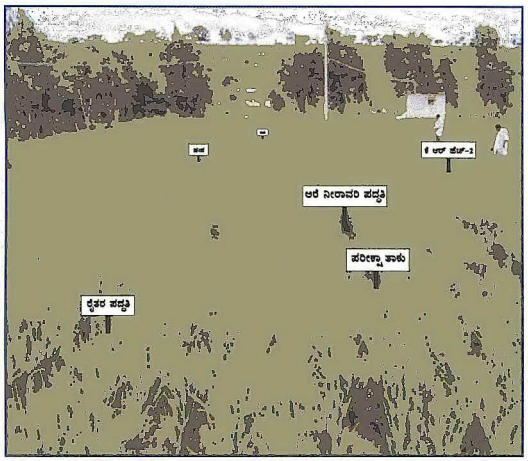

Fig. 6 Layout of FFS plot

Fig. 7 FFS Session- Discussion on activities to be carried out during session

Fig. 8 FFS Session- Conducting AESA

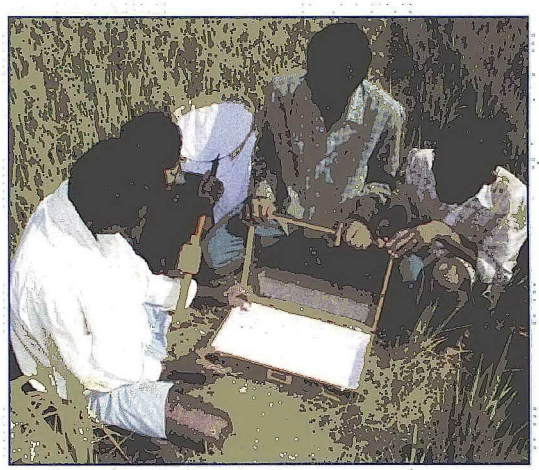

Fig. 9 FFS Session- Maintaining insect zoo

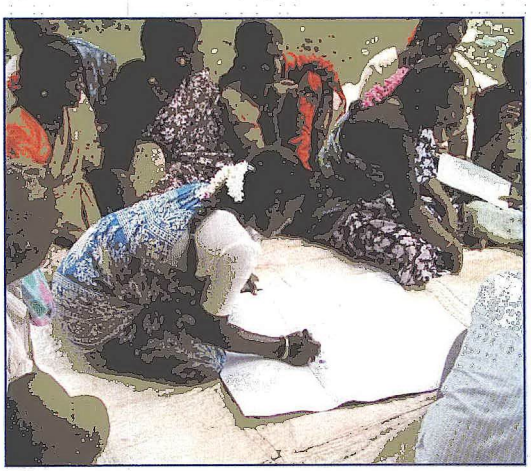

Fig. 10 FFS Session- Preparation of visuals on AESA observations

Fig. 11 FFS Session- Group dynamic activity to break monotony

Fig. 12 FFS Session- Presentation of results to the group

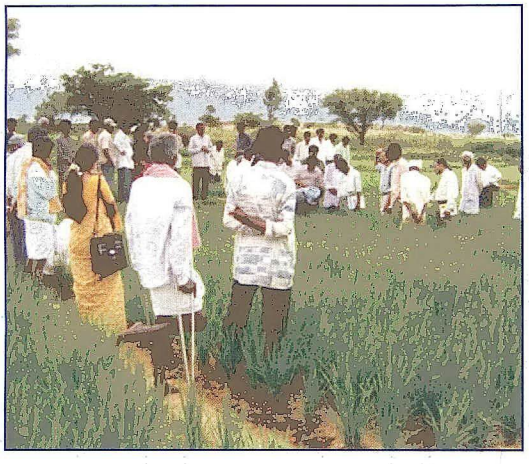

Fig. 13 Field visit by farmers of neighboring villages

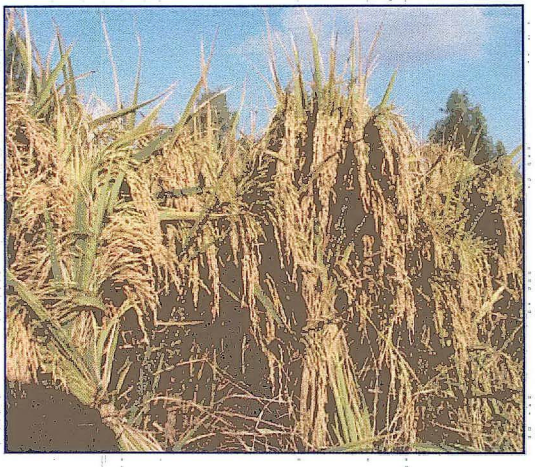

Fig. 14 Crop at an impressive stage

Fig. 15 Field Day

d. Analysis of results: Based on the observations taken, encouraging participants to adopt simple technique called overlapping test to compare the treatment effects. The observations in each session on growth and yield parameters were subjected for analysis and to draw meaningful conclusions. The scoring pattern followed was as follows.

- Analyzed growth parameters in required sessions 2 score; few sessions 1 score, none zero.
- Analyzed yield parameters in required sessions 2 score; few sessions 1 score, none zero.

e. Withdrawal: After harvest of the crop and analysis of data, the results have to be presented to gramasabha. Also, at this stage, it is preparing the participants, collaborator and other villagers to accept phasing out of the activities. Information on this component was obtained from facilitators and ascertained whether facilitators prepared the participants and collaborators for phasing out or not. If prepared, one score was given, and one score was given if follow-up arrangements were indicated. Otherwise, zero score was given.

Working out Execution Efficiency Index

The score obtained by facilitator for all the sub components of execution (a-e) were calculated and execution efficiency index was computed using the procedure outlined below.

$$Execution\ \ efficiency\ \ index = \frac{\left[\begin{array}{c}Actual\ score\ obtained\ by\ facilitator\ for\ implementation\\(a\ \ to\ \ e\ \ sub\ components)\end{array}\right]}{\left[\begin{array}{c}Possible\ \ score\ \ for\ implementation\\(a\ \ to\ \ e\ \ sub\ components)\end{array}\right]} \times 100$$

3.3.1.3 Participation

It is the extent of involvement of participants and collaborators in different activities of FFS. The information on participation of participants and collaborators was obtained from facilitators as experienced by them in the activities viz., selection of problem, deciding solutions, selection of treatments, preparation of layout, preparation of calendar of operations, field observations, group dynamic activity,

preparation of material for presentation, drawing inferences and field day celebrations. The scoring pattern followed was that one score was given for active participation per activity. Again for each activity, score were given depending upon per cent attended. If the participation was more than 75 per cent of the participants, 4 score; 3 score for 50 - 75% participants' participation; 2 score for 25-50% participation and 1 score for less than 25% participation. Thus each item can get a maximum score of 5 (1 for Nature of participant and 4 for extent of involvement of participants). There were 10 items on this component. Thus, the maximum attainable score for this variable was 50.

Working out Participation Efficiency Index

The participation efficiency index for each facilitator was worked out using the procedure described below.

$$Participation\ Index = \frac{\left(\begin{array}{c}Actual\ score\ obtained\ by\ facilitator\ for \\ eliciting\ participation\ of\ farmers\end{array}\right)}{Possible\ score\ for\ participation} \times 100$$

Implementation process efficiency index

Implementation process index for each facilitator considered in the study was calculated as per the procedure indicated below.

Considering the sub components of planning, implementation and participation, total score obtained for planning, implementation and participation were calculated and implementation process index was arrived at using the formula indicated below.

$$IPEI = \frac{\left(\frac{\begin{array}{c}Total\ score \\ obtained\ in\ planning\end{array}}{Possible\ score\ in\ planning}\right) + \left(\frac{\begin{array}{c}Total\ score \\ obtained\ in\ implementation\end{array}}{\begin{array}{c}Possible\ score\ in \\ implementation\end{array}}\right) + \left(\frac{\begin{array}{c}Total\ score \\ obtained\ in\ participation\end{array}}{\begin{array}{c}Possible\ score\ in \\ participation\end{array}}\right)}{3} \times 100$$

IPEI = Implementation Process Efficiency Index

3.3.2 Investment per participant

It is the investment made from the project for organising FFS. The expenditure on staff salaries, transport hire, travel costs, input costs, FFS kit, stationery and boarding

expenses incurred during each session were considered for arriving at total expenditure incurred for each FFS. That amount was divided by number of participants including collaborators, involved in FFS to arrive at cost per person.

3.3.3 Impact of FFS

3.3.3.1 Knowledge level of FFS participants

It is the extent of information acquired by the participants and collaborators on the crops / technologies considered in FFS as a result of their participation. To assess the extent of knowledge gained, teacher made test was constructed by using fill in the blanks questions. These questions were set in simple, unambiguous and local language (Kannada), covering integrated crop production technologies. This test was pre-tested with farmers in the Farmers Training Institute, Hebbal, Bangalore, to find out their response pattern as well as to edit questions or language. After this process, nine main questions were retained with one to four sub questions in the main question depending upon the importance of information. The total possible score on these items per respondent, who answered all the questions correctly, was 25 and for a respondent who answered all items incorrectly, the score possible was zero.

3.3.3.2 Symbolic adoption of FFS participants

Symbolic adoption refers to mental acceptance of an innovation. Singh and Singh (1976) operationalised symbolic adoption as the decision of the farmers to use innovation. In this study, symbolic adoption refers to the decision made by the FFS participant / collaborator to adopt semi irrigated paddy (Modified Madagascar Paddy) cultivation, (as it was the new technology considered in FFS) in the subsequent seasons. Earlier researchers like Channegowda (1977), Nagaraja (1979) and others have measured symbolic adoption of farmers with respect to new crops by asking some simple questions. On the same lines of the earlier researchers, four questions were asked to elicit symbolic adoption behaviour of FFS participants/ collaborators on semi irrigated paddy as followed by Surekha (1999) in respect of watershed development technology. Each question had three alternatives. Out of which, only one was reflecting full symbolic adoption behaviour such response was

given score of 3. The others were indicative of symbolic adoption in relative terms; such responses were given score of 2 and 1, depending upon the relative importance.

3.3.3.3 Farmers opinion about FFS

It was the response from both participants and collaborators of FFS about the appropriateness of FFS. Seven questions were considered to elicit response on this item viz., subject / topic selected for FFS, number of sessions conducted, duration of each session, opportunity for participating farmers to learn about technology, level of participation of farmers, adaptability to other crops and technical competence of facilitators. For each question, response was sought whether it was appropriate or needs modifications. If modifications were required, type of modifications required was also noted. The number of respondents expressing the appropriateness of items were checked and presented as frequency table in the results chapter.

3.3.3.4 Yield obtained in FFS

The information on yields obtained from the crops considered in FFS and farmers practices were collected from the field records of KCBTMP. The major crops considered were paddy, maize, sunflower, ragi, groundnut and tomato. The yield obtained per hectare was considered and presented.

3.4 Measurement of independent variables

3.4.1 Personal variables

Age: The number of years completed by the respondent at the time of investigation.

Education: Education is the process of producing desirable changes in the behaviour of an individual. In this study, this variable referred to the amount of formal schooling undergone by a agriculturist in terms of number of years which he successfully completed as indicated by the formal standards attained. The respondents were asked to indicate the type of education they had, from among the following five types. The corresponding score are given as under

Sl. No.	*Type*	*Score*
1.	No formal education	0
2.	Primary education	1
3.	Middle School education	2
4.	High School education	3
5.	Collegiate education	4

Based on the scoring procedure, the maximum score an individual could obtain was 4 and the minimum 0.

Management orientation: It is the degree to which a farmer is oriented towards scientific farm management comprising of planning, production and marketing function of his farm. The procedure developed by Samanta (1977) was followed in the study.

Innovative proneness: It is defined as a socio-psychological orientation of an individual to get linked or closely associated with change, adopting innovative ideas and practices. Feaster (1968) has developed a scale to measure this variable. For the present investigation, the statements considered by above researcher were used with slight modification. The same procedure was followed in the present investigation to know the innovative proneness of farmer. In this scale, eight statements were included with three response categories as 'yes', 'undecided' and 'no'. For the positive statements, a score of 2 was assigned to 'yes' response, a score of 1 for 'undecided' and '0' for 'no' response. The scoring procedure was reversed in the case of negative statements. The summation of the score obtained by the respondent for all the eight statements indicated his innovative proneness score. The total score ranged from 0 to 16.

Risk orientation: It is the degree to which a Agriculturist is oriented towards risks and uncertainty in agriculture, and has the courage to face the various risks involved in agriculture. Supe (1969) developed a scale for measuring risk orientation of farmers. The scale contained 6 statements. The same scale was used in the present study with slight modifications. Fifth statement was negatively keyed and all others were positively keyed. In the case of positive statements, a score of one was

assigned for the 'yes' response and zero score for 'no' response. This was reversed in the case of negative statement. The score were added up which gave the total score obtained by a respondent for this variable. The score ranged from 0 to 6.

Cosmopoliteness: It is defined as the degree to which an individual is oriented to his immediate social system outside. The cosmopolite farmer is likely to be a unique individual in that he is motivated to look beyond his environment when most others are content to maintain a localistic frame of reference. This variable was measured using the scale developed by Desai (1981). Two dimensions of the variable were considered in this case.

a. The frequency of visit to the nearest town.

b. The purpose of visit to the town.

The items and scoring pattern followed in quantifying the frequency of visit were as follows.

Sl. No.	*Item*	*Score*
a.	Two or more times per week	5
b.	Once per week	4
c.	Once in fifteen days	3
d.	Once in a month	2
e.	Seldom	1
g.	Never	0

The items and scoring procedure to quantify the purpose of visit were as given below.

Sl. No.	*Item*	*Score*
a.	All visit relating to agriculture	5
b.	Some visits relating to agriculture	4
c.	Personal / domestic	3
d.	Entertainment	2
e.	Others	1
f.	No response	0

The cumulated maximum score obtainable was 10 and the minimum was 0.

Organizational participation: It is the degree of involvement of the respondents from more membership to organizational positions and his active participation in the activities of local formal organizations like grama panchayat, taluk panchayat, zilla panchayat, Milk Producers Cooperative Society, farmers-co-operative society, mahila mandals, self help groups etc. This was quantified using method followed by Trivedi (1963) with slight modifications in items is as under.

Sl. No.	*Item*	*Score*
1.	Member in any organization	1
2.	Not a member in any organization	0
3.	Office bearer	1
4.	Not a office bearer	0
5.	Extent of participation in the organization	
	Never	0
	Occasional	1
	Regular	2

The range of score was from 0 to 28.

3.4.2 Situational variables

Family size

Family size referred to the total number of persons in a family. One score was assigned for every member in the family irrespective of the sex and age.

Size of land holding

It is the extent of land possessed by the respondent for cultivation. Data regarding total number of acres of dry, wet and garden lands as reported by the respondents as having possessed by him were collected. The extent of wet and garden lands were converted into dry land unit by multiplying irrigated land or wet and garden land by two. Then this acreage was added with dry and thus all types of lands were expressed in the form of dry land. The total dry land in acres was the size of landholding possessed by the farmer.

Irrigation potential

It is defined as the net agriculture area irrigated throughout the year.

All possible sources of irrigation like well, borewell, canal, tank etc. were considered for the quantification.

3.4.3 Extension variables

Contact with extension agency

It is the extent of contact with the change agents by the farmers to seek information on agriculture enterprises. To measure this variable, frequency and purpose of meeting the change agents by farmers were considered. The scoring pattern followed is presented below.

Sl. No.	*Response*	*Score*
a.	Not aware of extension agents	0
b.	Aware of extension agents	1
c.	Frequency of contacts	
	Often	1
	Sometimes	2
	Regular	3
d.	Purpose of contact	
	Casual	1
	To seek technical information	2

The total score of all these items formed the contact with extension agency score of the respondents. The score ranged from 0 to 36.

Exposure to mass media

This referred to the frequency of reading newspaper, farm magazine and other literature related to agriculture as well as listening to radio, viewing television (TV), using computers for agricultural information. This variable was quantified by using following procedure.

Score of two for regular participation (exposure), one for occasional participation and zero for non-participation were assigned separately for newspaper, periodicals, leaflets, other farm magazines, radio broadcasting relating to agriculture, viewing TV, using computer for agriculture information etc. The score added for all the

items formed the exposure to mass media score of the respondents. The total score range from 0 to 14.

3.5 Development of interview schedule

Two sets of interview schedules were developed based on the objectives of the study. The first set was to elicit information from facilitators on the implementation process. This had questions relating to planning process, execution process, level of participation of respondents, implementation costs per participant and problems observed by them in implementation of FFS. This interview schedule was developed considering the procedure outlined in the project documents and discussing with project implementation authorities, at the headquarters level and at field level. The draft schedule was circulated to staff at headquarters level and field staff from non sample area and suitable modifications were incorporated as suggested by them.

The second set of schedule was developed and used to elicit information from farmers/participants and collaborators of FFS. This schedule had questions relating to identifying information of respondents, personal, situational, extension variables, knowledge level on crops considered in FFS, symbolic adoption and opinion on FFS including problems observed. A draft schedule was developed and pre tested with farmers who were undergoing training in Farmers Training Institute, Hebbal, Bangalore. In light of pre test experience, the interview schedule was revised and used for the study.

3.6 Locale, sample and conduct of field study

The study was conducted in the districts of Kolar, Tumkur and Chitradurga, where KCBTMP has been in operation (Fig 16).

In the study, two types of respondents were considered namely, facilitators (Project staff responsible for implementation of FFS), and the farmers (included both participants and collaborators). Ten facilitators (five from Kolar district, four from Tumkur district and one from Chitraduraga district) who have implemented FFS

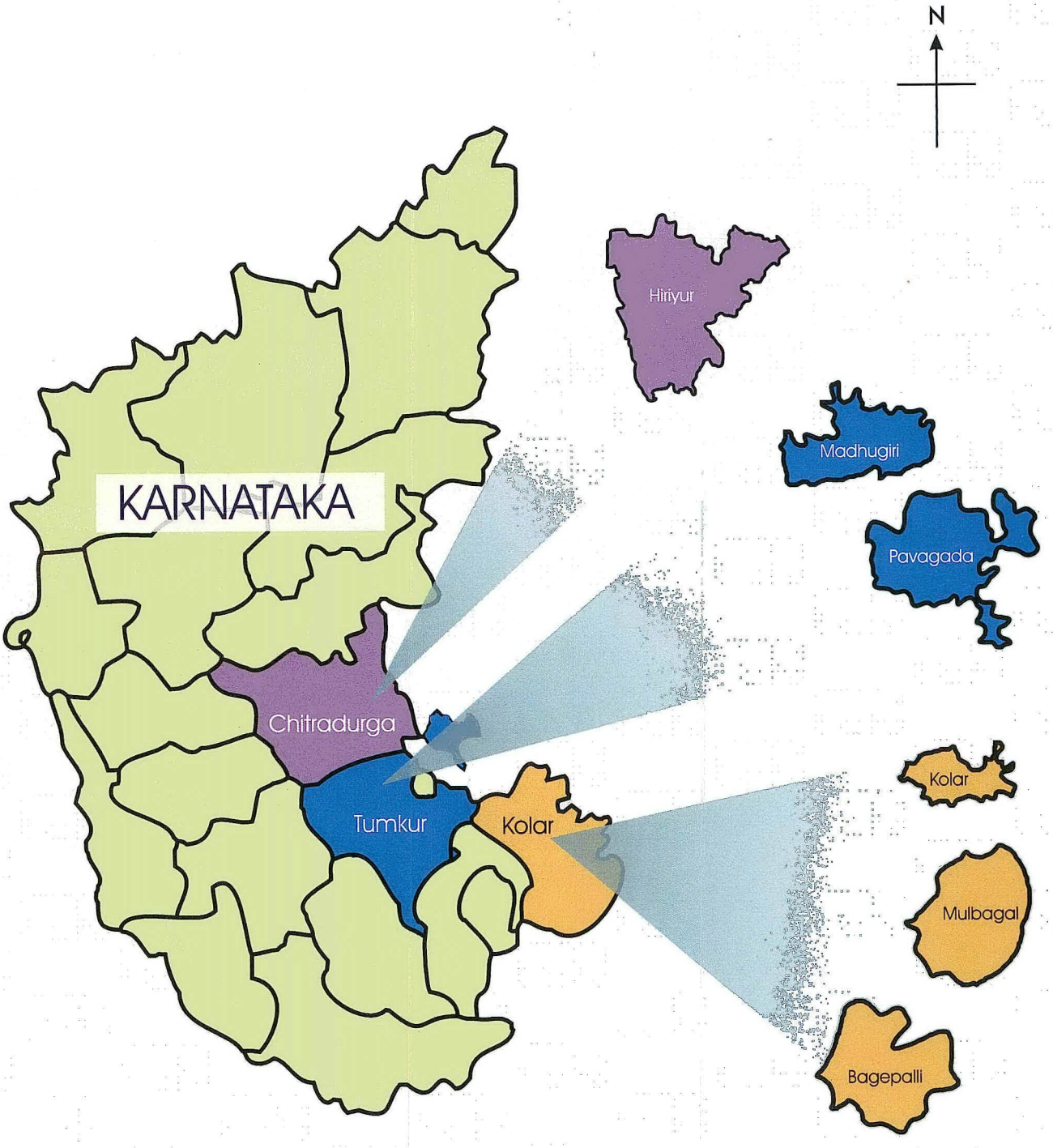

Fig. 16 Locale of the Study

during 2003-04 were considered to analyse the implementation process followed in KCBTMP.

Ninety farmers at the rate of 15 participants including collaborators from the following places, where semi irrigated paddy is cultivated (Modified Madagascar Method) was considered as subject in FFS were selected. Out of 30 participants in each FFS, 15 were selected randomly. The district wise taluks and villages selected were as follows.

District	*Taluk*	*Village*
Kolar	Bagepalli	Bovinavarapalli
	Kolar	Chaluvanahalli
	Mulbagal	Minijenahalli
Tumkur	Madhugiri	Kamthanahalli
	Pavagada	T.N.Betta
Chitradurga	Hiriyur	Hemadala

The information was collected through personal interview method and recorded information in the schedules developed for the study. The secondary information from project records was also obtained.

3.7 Collection of data

The information from facilitators was obtained using first set of schedule. The facilitators were requested to fill up the schedule on their own. After their completion, required clarifications were sought and recorded. The information from participants and collaborators was obtained by interviewing each of the selected respondents and information was recorded in the schedule.

3.8 Analysis of Data

The statistical tests used for analyzing data of the investigation were mean, standard deviation, percentage, rank order and correlation.

Results

IV. RESULTS

Results of the study are presented under the following headings.

4.1 Implementation process of FFS in KCBTMP

4.2 Impact of FFS in KCBTMP

4.3 Relationship of selected personal, situational and extension variables on respondents' knowledge level and symbolic adoption behaviour.

4.4 Problems in implementation of FFS

4.1 Implementation process of FFS in KCBTMP

Table-1 indicates the mean score for different sub-components of implementation process as well as overall implementation processes. It could be seen from the table that overall implementation process of farmers field schools in KCBTMP was exceedingly well as revealed by higher mean index value (84.18). The mean score for planning process was 85.00. Similar trend was also observed in execution of planned activities (81.20) and in eliciting participation of FFS participants and collaborators (86.40) in the whole set of activities of FFS.

Table-1: Implementation process efficiency of FFS in KCBTMP

(n=10)

Sl. No.	*Implementation process items*	*Mean score*
1.	Planning efficiency	85.00
2.	Execution efficiency	81.20
3.	Eliciting participation of participants	86.40
4.	Overall implementation process efficiency	84.18

4.2 Economic analysis of FFS

According to the information supplied by CBTMPCS, University of Agricultural Sciences, Bangalore, the expenditure incurred for one FFS (with 30 participants and collaborators and for 10 sessions) was found to be Rs.41,000/-. This will include salaries and allowances to staff, input costs, and other organizing costs. Thus, the expenditure per person was Rs.1366/- (Table-2).

Table-2: Economic analysis of FFS

Sl. No.	*Implementation process items*	*Expenditure (Rs.)*
1.	Staff salaries	22000
2.	Transport hire and daily allowances to staff	8000
3.	Input costs	2000
4.	FFS kit (lens, insect collection net, etc.)	2000
5.	Stationery	2000
6.	Boarding expenses during sessions	5000
	Total	**41000**
	Per person expenditure	1366

(Source: CBTMPCS records of UAS, Bangalore)

4.3 Impact of FFS in KCBTMP

4.3.1 Profile of FFS participants and collaborators

Impact of FFS was assessed considering the consequential effects of FFS on participants and collaborators, who have participated in FFS. Ninety such participants were considered in the study and they were categorized into meaningful groups under each variable for understanding their profiles and the same is presented in Table-3.

It could be seen from the Table-3 that, majority of the respondents belonged to either young or middle age group, lower education, low to medium management orientation, lesser innovative proneness, medium risk orientation, lesser cosmopoliteness and lesser organizational participation; smaller to medium size families; small farmers; less irrigation facilities; and lesser contacts with extension agencies and lesser mass media exposure.

Table-3: Profile of FFS participants / collaborators

(n = 90)

Character	*Categorization*	*Frequency*	*Percentage*
Personal variables			
Age	Young	56	62.22
	Middle	29	32.22
	Old	05	5.56
Education	No	23	25.56
	Primary	29	32.22
	Middle	16	17.78
	High	14	15.56
	College	08	8.89
Management orientation	Low	30	33.33
	Medium	33	36.66
	High	27	30.00
Innovative proneness	Low	42	46.66
	Medium	35	38.88
	High	13	14.44
Risk orientation	Low	18	20.00
	Medium	72	80.00
	High	00	00.00
Cosmopolitans	Low	31	34.44
	Medium	43	47.77
	High	16	17.77
Organizational participation	Low	53	58.88
	Medium	30	14.44
	High	24	26.66
Situational variables			
Family size	Small	27	30.00
	Middle	50	55.55
	Big	13	14.44
Land holding	Marginal Farmers	23	25.55
	Small Farmers	31	34.45
	Big Farmers	36	40.00
Irrigation Potential	Low	42	46.66
	Medium	33	36.66
	High	15	16.66
Extension Variables			
Contact with extension Agency	Low	35	38.88
	Middle	15	16.66
	High	40	44.44
Mass Media Exposure	Low	40	44.44
	Medium	26	28.88
	High	24	26.66

(Mean plus or minus half standard deviation were considered to classify into three categories except education)

4.3.2 Knowledge level of respondents

Table-4 indicates the mean knowledge score of FFS participants and collaborators as well as their classification as low, medium and high categories based on mean and standard deviation. It was interesting to note that the overall mean knowledge index of participants was 84.89, signifying that the farmers had very high knowledge about the technologies considered in FFS. The range was between 78.00 and 96.00 with a difference of 18. This further confirms that, the least score was 78.00, which, of course is also high indicating that farmers were well versed with the technologies to the extent of 78.00 per cent. Classification of FFS participants based on mean ± ½ standard deviation revealed that majority (63.33%) belonged to either medium or higher knowledge level categories.

Table-4: Knowledge index of FFS participants and collaborators

(n=90)

Category	*Frequency*	*Percentage*
Low	33	36.67
Medium	28	31.11
High	29	32.22
Total	**90**	**100.00**

Mean = 84.89, Standard deviation = 4.73, Range = 78.00 to 96.00

4.3.3 Symbolic adoption behaviour of respondents

Classification of FFS participants and collaborators on their symbolic adoption score is presented in Table-5. An examination of the table indicates that 42.23 per cent of the respondents were highly convinced about the technologies and exhibited their willingness to adopt the technologies learnt in FFS in their operational holdings in the subsequent seasons. A considerable percentage (33.33) also had moderate level of willingness to adopt technologies in their fields. Thus, majority were convinced to adopt the technologies learnt in FFS.

Table-5: Symbolic adoption of FFS participants and collaborators

(n = 90)

Category	*Frequency*	*Percentage*
Low	22	24.44
Medium	30	33.33
High	38	42.23
Total	**90**	**100.00**

Mean = 9.63, Standard deviation = 1.13, Range = 8 to 12

4.3.4 Crop yields in FFS

Table -6 depicts the average yields per hectare obtained in major crops grown in both FFS plots and in the plots with farmers' practices. It is interesting to know from the table that increase in yield in FFS plots over the farmers' practices was considerable. The increase in yield was higher in maize 55.42 per cent, followed by paddy 36.34 per cent, ragi 35.91 per cent, sunflower 30.58 per cent, tomato 21.03 per cent and groundnut 16.66 per cent.

Table-6: Average yields of major crops considered in FFS

Sl. No.	*Crop*	*No. of FFS*	*Area in ha*	*Average yield Q/ha*		*Per cent increase in yields*
				FFS plot yield	*Farmers practice yield*	
1.	Paddy	7	5.6	61.00	44.74	36.34
2.	Hybrid Maize	3	2.4	50.00	32.17	55.42
3.	Sunflower	3	2.4	22.20	17.00	30.58
4.	Groundnut	2	1.6	21.70	18.60	16.66
5.	Ragi	2	1.6	30.20	22.22	35.91
6.	Tomato	1	0.8	24.45(t/ha)	20.20(t/ha)	21.03

4.4 Relationship of selected personal, situational and extension variables on respondents' gain in knowledge and symbolic adoption behaviour

4.4.1 Relationship with knowledge level

The correlation coefficient (r) of twelve variables with knowledge index is furnished in Table-7. It could be seen from the table that the correlation coefficients in respect of age and irrigation potential were found significantly related at 5 per cent level of probability. Among these two variables, the age was negatively related. Whereas, irrigation potential was positively related. This signifies that younger age respondents gained more knowledge compared to older age respondents. The respondents with higher irrigation facilities gained more knowledge than those who had lesser irrigation facilities. However, the variables education, family size, size of land holdings, management orientation, innovative proneness, risk orientation, cosmopoliteness, organizational participation, contacts with extension agency and exposure to mass media were not significantly related with gain in knowledge indicating that these variables had similar effect on all the respondents.

Table-7: Correlation between knowledge index and selected personal, situational and extension variables of FFS participants/collaborators

(n=90)

Independent variables	*r-value*
Age	-0.220*
Education	0.190
Managemental orientation	0.078
Innovative proneness	0.111
Risk orientation	-0.106
Cosmopoliteness	0.020
Organizational participation	0.084
Family size	0.193
Size of land holdings	0.120
Irrigation potential	0.212*
Contact with Extension agency	0.104
Exposure to mass media	0.165

** Significant at 5% level of probability*

4.4.2 Relationship with symbolic adoption behaviour

The correlation coefficients worked out between symbolic adoption of respondents and their selected personal, situational and extension variables are depicted in Table-8. It could be seen from the table that correlation coefficients in respect of innovative proneness, organizational participation, contact with extension agency and mass media exposure were positively and significantly correlated at 5 per cent level, except mass media exposure, it was significantly correlated at 1 per cent level. However, other eight variables viz.; age, education, family size, size of land holdings, irrigation potential, management orientation, risk orientation and cosmopoliteness, were not significantly correlated. This indicates that these eight variables had similar effect on all the respondents considered in the study.

Table-8: Correlation between symbolic adoption behaviour and selected Personal, situational and extension variables of FFS Participants/ collaborators

(n=90)

Independent variables	*r-value*
Age	0.008
Education	0.137
Managemental orientation	0.124
Innovative proneness	0.208*
Risk orientation	0.046
Cosmo politeness	0.023
Organizational participation	0.244*
Family size	0.183
Size of land holdings	0.130
Irrigation potential	0.099
Contact with Extension agency	0.213*
Exposure to mass media	0.301**

** Significant at 5% level of probability* *** Significant at 1% level of probability.*

4.5 Problems in implementation of FFS

4.5.1 Problems as expressed by facilitators

Table - 9 depicts the list of problems/constraints expressed by facilitators in implementing FFS. It is evident from the table that the important problems/ constraints expressed by the facilitators were ensuring attendance of participants and collaborators in all the sessions. This was followed by lengthy duration of each session, difficult for one facilitator to manage the session, difficult to take observations by the participants and collaborators when replications are more than one and considerable time requirement to take follow up activities.

Table – 9 Problems as expressed by facilitators in implementation of FFS

(n = 10)

Sl. No.	*Problem/ Constraint*	*Relative weightage score*	*Rank order*
1.	Ensuring attendance of participants and collaborators in all the sessions difficult	0.80	I
2.	Longer duration of session (5 hrs.)	0.70	II
3.	Difficult for one facilitator to manage a session	0.60	III
4.	Difficult to have more than one replications	0.50	IV
5.	Follow up support consumes more time	0.40	V

4.5.2 Opinion of participants / collaborators on FFS

The respondents' opinion about appropriateness of FFS has been presented in Table-10. It was surprising to note that all the respondents have expressed that the crops/subjects selected for FFS, scope for participants to learn, their active involvement, adaptability to other crops in any given situation and competence of facilitators (both technical and organizational) were appropriate signifying that no change was required.

Table- 10: Participants and collaborators opinion about appropriateness of FFS

Sl. No.	*Item*	*Appropriateness*	
		No.	*Percent*
1.	Crops/subjects selected for FFS	90	100.00
2.	Scope for participants to learn	90	100.00
3.	Opportunity for active participation of participants	90	100.00
4.	Adaptability of approach to other crops/technologies	90	100.00
5.	Competence of facilitators	90	100.00
6.	No. of sessions scheduled and attendance	68	75.55
7.	Duration of each session	48	53.33

However, about 25 per cent of respondents have expressed that number of sessions conducted were inappropriate. But, it is important to note that nearly half of the respondents have expressed that the duration of each session was not appropriate and expressed to reduce the session time. It is evident from the data that present approaches in the conduct of FFS is to be continued with slight changes in duration of each session.

Discussion

V. DISCUSSION

The results of the study presented in preceding chapter are interpreted and discussed in this chapter under the following heads.

5.1 Implementation process of FFS in KCBTMP

5.2 Impact of FFS in KCBTMP

5.3 Relationship of selected personal, situational and extension variables on respondents' knowledge level and symbolic adoption behaviour

5.4 Problems in implementation of FFS

5.1 Implementation process of FFS in KCBTMP

It was revealed from the results of Table-1 that, planning and implementation processes were carried out very effectively by the facilitators besides eliciting active participation of FFS participants and collaborators at different stages of FFS leading to achievement of excellent performance in overall implementation process. Probable reasons for this trend could be following,

- The facilitators in implementation of FFS were the graduates and post graduates in agricultural sciences. They were given trainings in three phases on implementation of FFS. The first training was organized before the FFS was initiated, and the subjects covered in that training were concept, importance and procedures in execution of FFS. The second training was also organized prior to implementation of FFS and in that training skills were taught in respect of problems identification, prioritization, identification of appropriate solutions, selection of treatments and replications, layout of experimental plot, agro-eco systems analysis, group dynamic exercises, small group management, ballot box test, analysis of results using overlapping tests and interpretation of results. The trainers were those who have already implemented FFS in FAO programme. The third training was organized when the 2003 kharif FFS implementation was in the middle. In this training, the problems experienced by the facilitators were the subjects. On those

topics, detailed discussions were held besides training at the field level on certain topics like AESA.

- The facilitators were supplied with relevant reference material on implementation guidelines on FFS and it was developed in local language (ರೈತರ ಕ್ಷೇತ್ರ ಪಾಠಶಾಲೆ – ಅನುಷ್ಠಾನ ಮಾರ್ಗದರ್ಶಿ) covering all aspects of FFS viz., concept, importance, required competencies of facilitators, criteria for selection of collaborators and facilitators, steps involved in FFS, suggested methodology for each step, expected output, follow-up action and some examples in the form of appendices. This reference material might have helped the facilitators to immediately refer when some clarifications were needed at the field level.
- A field manual was also supplied to the facilitators, to record the whole process of implementation of FFS and it was checked periodically by the project staff. This might have also helped the facilitators to follow all the steps in a sequence.
- Subject matter specialists and District Coordinators from CBTMPCS were also participating in most of the FFS sessions. Any difficulty experienced by the facilitator was solved at the field level instantaneously.
- Every month, the facilitators had an opportunity to express their difficulties and to seek required support from CBTMPCS in their monthly meeting. This must have also helped them to acquire good experience of fellow facilitators.

Therefore, it is justifiable to expect better implementation process in KCBTMP.

5.2 Economic analysis

From the results of Table-2, it can be seen that the expenditure incurred per participant and collaborator was Rs.1, 366/-. Though the expenditure incurred per person was found to be higher, the consequential effects are commendable. Participants can learn the process of solving the problem and also pickup the skills of experimentation at his/her field level whenever a problem is observed in future in their fields. In fact, Quizon *et al.* (2000), while evaluating IPM-FFS activities in Philippines and Indonesia, have found that the Investment per farmer was US$ 47.6

(Indian Rs.2142) in Philippines and it was US $62 (Indian Rs.2790) in Indonesia. Compared to these costs, the investment per person in KCBTMP was considerably less.

5.3 Impact of FFS in KCBTMP

5.3.1 Profile of respondents

The results in Table-3 revealed that, the respondents considered in the study were mostly younger farmers and farm women, with lesser education level, lesser management orientation, lesser innovativeness, lesser risk orientation, lesser cosmopoliteness, lesser organizational participation, medium size families, smaller farmers, lesser irrigation potential, lesser contacts with extension agents and lesser exposure to mass media.

The respondents of the study belonged to lower profiles. This was because, while selecting the FFS participants, enough representation was given to farmers and farm women of lower profiles. Therefore, it is confirmed that the criteria set by the project authorities was followed while selecting FFS participants.

5.3.2 Knowledge level of respondents

It is interesting to note from the Table-4 that higher levels of knowledge were observed among participants and collaborators of FFS. The probable reasons are that the participants and collaborators had an opportunity to actively involve in problem identification, selecting the solutions, and trying them in the field from sowing to harvesting. Therefore, they might have observed the cause and effect relationships more closely when they met during FFS sessions. Farmers and farm women have also worked in small sub groups to conduct agro eco system analysis, collection and analysis of data and to take decisions based on the observations made. This might have helped them to get the messages registered in their mind. Also, learning continued until full crop season. Some farmers also tried the technologies considered in FFS in their own field simultaneously.

Further, following theories support effective learning by FFS participants

- Theory of association, implying that inter related practices are learnt faster by the learners.

- Commitment to activation by Learner (1981), that passive acquiescence towards innovations from the outside but also a vigorous sense of initiative from with in one self to activate new ways, which is usually referred to an innovativeness. Thus, FFS provided opportunity to participants and collaborators to become innovative.
- Gestalt's theory, states that there are wholes, the behaviour of which is not determined by that of their individual elements, but where the part-processes are themselves determined by the intrinsic nature of the whole. Thus, FFS provides an opportunity to an individual to understand importance and effect of sub activities in the main activity, cumulative effect of each activity.
- Thorndike's trial and error method - learning is a result of reward which comes from success after trial and error. The FFS will provide an opportunity for the participants and collaborators to get rewards after successfully experimenting in the field and getting positive results. Before getting positive results, repeated trials and errors might have occurred.
- Principle of frequency proposed by Watson (1919) indicates that frequently performed acts, habits or responses learnt better than those infrequently practiced. In FFS, the participants and collaborators will have enough scope for frequent practice of different operations in FFS plot as well as in their own plots. Thus, the practice makes the person perfect in FFS.
- Internal group dynamics theory, which moulds the behaviour of participants of FFS to have healthy discussions and to sustain group action leading to multiplier effect of learning.
- Adult learning principles emphasis that adults learn best when they put-forth efforts to satisfy their basic needs, wants, desires or urges to have security, new experience and recognition. In FFS, they have the opportunity to put-forth sincere efforts to learn and to derive satisfaction.

The findings of Krishnamurthy (1999) revealed that 73.00 per cent of the farmers involved in FFS possessed moderate to higher knowledge on IPM on rice in Karnataka. Thus, this finding supports the findings of the study.

5.3.3 Symbolic adoption behaviour of respondents

The results in respect of symbolic adoption behaviour of FFS participants and collaborators revealed that, vast majority expressed their willingness to adopt technologies learnt in FFS in their own fields in subsequent seasons (Table-5). Krishnamurthy (1999) found that 48.00 per cent of the farmers involved in FFS have adopted IPM practices in rice.

The FFS participants might have carefully and constantly observed the performance of introduced technology. They might have assessed the risks, uncertainties and complexities involved, if any. When they were convinced that there were no such complexities, they might have formed favourable attitudes towards technology leading to symbolic adoption behaviour. Thus the findings are logical.

5.3.4 Increase in crop yields

Findings of the study have shown that, yields obtained in major crops considered in FFS, were considerably higher than those in the plots with farmers practices (Table-6). The increase in yields of hybrid maize was as high as 55.00 per cent. It was also significantly higher in paddy, ragi and sunflower.

It is obvious to expect higher yields in FFS plots because of the following reasons.

- All operations were performed by blending indigenous and recommended practices, which is suitable to locality
- The performance of the crop/technology was constantly observed by both technical experts and farmers. When there was a need to take up corrective measures, they were taken
- Most of the operations were performed timely as per the calendar of activities
- The required inputs were available on time to the participants as they were supplied by the project authorities
- There was continuous monitoring of whole process by the project staff at different levels.

There were no studies available either to support or contradict the findings of the study.

5.4 Relationship of selected personal, situational and extension variables on respondents' gain in knowledge and symbolic adoption behaviour

5.4.1 Relationship with knowledge level

The findings of this study have shown that respondents' age was negatively and significantly related with their knowledge level. Whereas, irrigation potential was positively and significantly related. Remaining ten variables viz.; education, management orientation, innovative proneness, risk orientation, cosmopoliteness, organizational participation, family size, land holding, contact with extension agents and mass media exposure were not significantly related.

Age

Younger people in general are more enthusiastic and dynamic. Prempasricha (1963) stated that the old age subject gain in knowledge goes down because of the fact that they cannot keep up the speed though they have more experience. Some of the reasons for decline in acquisition of knowledge by older subjects as suggested by psychologist, are the degeneration of the nervous system, lack of continued concentration, lack of interest in types of tasks, certain fixed habits that they have developed as a function of old age and experience and lack of necessity of exerting maximum efforts for such tasks. Thus, these qualities might have been responsible for making them to gain lesser knowledge compared to younger farmers.

Education

Educational level of respondents had no significant relationship with their knowledge level. Though education provides better exposure to different communication media, help to acquire more information through better perception and comprehension, such influence might have been nullified in FFS because of several strengths in FFS. It provides persistent reorientation to participants, where in, they gradually subsume science and innovation, changing on a better entrepreneur and ultimately reflecting on better acquisition of knowledge. Further, it provides opportunity for an individual to gather information and relate to

himself/herself. Therefore, FFS might have had equal influence on all types of participants. Thus, the findings seemed to be logical. However, Krishnamurthy (1999) found significant relationship between education and knowledge level of FFS participants.

Management orientation

Respondents' knowledge level had no significant relationship with their management orientation. Management orientation includes planning, production and marketing aspects. In the FFS, there was ample scope for the farmers to plan and implement different operations to produce the output. Of course, there was no much emphasis on marketing. Since, every participant had undergone these exercises; there must have been similar influence on every participant. Thus, there was no significant relationship.

Innovative proneness

Innovativeness was found to have no significant relationship with respondents' knowledge level. Learner (1981) indicated that, concern with success is an activity and optimism that it will be attained, can only be sustained by a commitment to activism, which requires, not only passive acquiescence towards innovations from the 'outside' but also a vigorous sense of initiative from within oneself to activate new ways, which is usually referred to as innovativeness. It was possible in FFS to make the participants to be innovative. Hence, the influence must have been almost similar on all the participants. The findings of Krishnamurthy (1999) did not support the present findings.

Risk orientation

Risk orientation had no significant relationship with knowledge level of participants. It could be explained that in FFS, because of group approach and constant facilitation by the experts, all the participants might have had similar influence. However, Krishnamurthy (1999) found significant relationship between risk orientation and knowledge level of FFS participants.

Cosmopoliteness

There was no significant relationship between cosmopoliteness of respondents' and their knowledge level. Probable reasons may be that the farmers and farm women in FFS were brought into an atmosphere of broader perspective where there was a better scope for them to exchange ideas, facts, feelings etc. among group of farmers within their local setting. It has also provided an opportunity to interact thoroughly. Therefore, individuals irrespective of their exposure to external world, might have acquired required knowledge on the subject, thus, the findings seemed to be logical.

Organizational participation

Organizational participation had no significant relationship with knowledge level. Organizational participation no doubt, throws open a number of situations under which the people adjust to the conditions. A widely participated person would have an opportunity to acquire broader vision, appreciation and favourable attitude towards new things. The FFS provides a kind of general mental development of the farmers which might help them to be more receptive while they are participating in FFS. Therefore, this method might have had similar influence on all the participants leading to this kind of result.

Family size

Family size did not establish significant relationship with knowledge level. While selecting FFS participants, mostly willing persons must have been considered irrespective of the family size, they might have participated regularly in different sessions. Therefore, similar influence could be seen.

Size of land holdings

Size of land holdings also did not establish significant relationship with knowledge level, the reasons indicated above might hold good here also. However, Krishnamurthy (1999) found significant relationship between these two variables in his study with FFS participants in Karnataka.

Irrigation potential

Irrigation potential was positively and significantly related with respondents knowledge level. The probable reason for this kind of result, may be that farmers with more irrigation facilities will have more opportunities and potentialities to try and adopt large number of technological innovations. As a result, it is quite possible that farmers with better irrigation facilities evince keen interest to know about new farm practices and be more receptive to such ideas, thus, leading to a better acquisition of knowledge. Therefore, irrigation potential must have shown positive and significant relationship with knowledge level.

Contact with extension agency

Contacts with extension agency did not show significant relationship with knowledge level. In FFS, farmers had regular and frequent contacts with facilitators. When there were frequent contacts, possibilities of getting the doubts cleared, acquisition of new information and gaining confidence could be expected among the participants of FFS. Therefore, FFS had equal influence on all the participants leading to this kind of result. The findings of the present study did not support the findings of Krishnamurthy (1999).

Exposure to mass media

There was no significant relationship between respondents' exposure to mass media and their knowledge level. This could be due to the fact that the inter personal communication was quite strong in FFS. Therefore, acquisition and retention of knowledge on the subjects tried in FFS was quite strong among respondents. Though respondents had differential level of exposure to mass media, those media channels could not influence the FFS participants. The findings of Krishnamurthy (1999) did not support the findings of this study.

5.4.2 Relationship with symbolic adoption behaviour

Innovative proneness, organizational participation, contact with extension agency and exposure to mass media were positively and significantly related to symbolic adoption behaviour of respondents. However, age, education, management

orientation, risk orientation, cosmopoliteness, family size, land holding and irrigation potential were not significantly related with symbolic adoption behaviour. The respondents with higher innovative proneness, organizational participation, contacts with extension agency and exposure to mass media will have favourable attitude towards newer technologies and they will be eager to try such technologies. They had all positive factors influencing them constantly. Therefore, positive and significant relationship with symbolic adoption must have been observed. Krishnamurthy (1999) has observed positive and significant relationship between FFS participants' adoption level and education, size of land holdings, exposure to mass media, contacts with extension agency, risk orientation and innovative proneness. The reasons explained in earlier section of knowledge will hold good for those variables which did not establish significant relationship with symbolic adoption.

5.5 Problems in implementation of FFS

5.5.1 Problems as expressed by facilitators

The facilitators have expressed five problems. Out of which, important ones were firstly, it was difficult to ensure attendance of participants and collaborators in all the sessions, and secondly, the duration of each session was more.

Difficulty in ensuring attendance of participants and collaborators : It is important that all the participants attend all the sessions scheduled as part of FFS to achieve desired effects on them. When a session is missed by a person, he/she will not have continuity and learning may not be complete and effective. Though the participants are very well aware of this, it may be inevitable for a few individuals to miss some of the sessions due to certain compulsions. Even in other countries, same problem has been experienced by the practitioners of FFS.

Lengthy duration of session : In KCBTMP, the duration of each session was five hours. Fifteen minutes were spent for understanding what was done in the last session. Next 30 minutes for agenda setting, two hours for field activities, AESA and recording observations in sub groups, 30 minutes for processing of AESA, 30

minutes to conduct group dynamic exercises to break monotony, 30 minutes for presentation of AESA results by sub group representatives. 30 minutes for planning activities for the ensuing session and lastly 15 minutes for review of day's activity. Though, it is important to spend more time in the session, it might be desirable to cut short the session by at least one hour.

5.5.2 Opinion of participants/collaborators on FFS

The participants and collaborators had expressed that duration of session and number of sessions be reduced to increase the attendance. The earlier reasons explained for facilitators observations on problems will hold good here also.

Summary

VI. SUMMARY

Agricultural extension programmes based on Farmers Field School approach are being implemented in some of the developing countries in Asia and Africa. The FFS was designed originally as a way to introduce Integrated Pest Management to irrigated rice farmers in Asia. Philippines and Indonesia were the main countries in implementing this educational approach. Now, it is being implemented in many countries.

Farmers Field School approach is a non formal, learner centered educational process. It seeks to empower people to solve their field problems actively by fostering participation, interaction, dialogue, joint decision making, self confidence and self determination. Farmers learn, by carrying out for themselves various activities related to a selected farming technology and through constant observation of the technology performance in the field. Some of the special features of FFS are; all learning is field based and so it is the primary venue for learning; it is a group activity, with about 30 farmers and farm women learn constantly over the experimentation period; learners (participants) work in small sub groups, collect data, analyze data and take decisions based on the results obtained; it promotes healthy discussions and quality decision making; learning continue until a crop season; facilitates farmer-to-farmer communication and extension staff serve as facilitators.

Owing to the special features of FFS, this was considered as one of the major approaches in technically empowering the farmers and farm women in the World Bank funded Karnataka Community Based Tank Management Project. The project proposes to cover 2000 tanks distributed in the districts of Kolar, Tumkur, Chitradurga, Haveri, Raichur, Bellary, Bagalkot, Bidar and Koppal.

The University of Agricultural Sciences, Bangalore has been serving as consultancy agency in this project (KCBTMP) to improve the productivity and production of farm systems involving crops and live stock agriculture to increase farmers' income in 1500 tanks commands of Kolar, Tumkur and Chitradurga districts. The University

proposes to implement FFSs in all the 1500 tanks covering about 44,400 farmers and farm women in 66 months period. During 2003-04 twenty four FFS were covered in 24 tank command areas and the rest will be completed before 2007-08 in a phased manner. Thus, the University has taken a massive programme of implementing FFS in the project area. Though FFS is a very good extension method, it is relatively new method and also risky. With a view to improve the implementation process and to create better impact among farmers, it was felt essential to study the implementation process in the initial stages and to suggest suitable changes if required. Hence, the study was taken up with the following specific objects.

1. To analyze Farmers Field School implementation process followed in KCBTMP
2. To assess the impact of FFS on collaborators and participants in KCBTMP
3. To find out the relationship between impact of FFS on farmers and the independent variables in KCBTMP
4. To identify the problems in implementation of FFS in KCBTMP

The study was conducted in the districts of Kolar, Tumkur and Chitradurga. Two categories of respondents were considered for the study. The first category was facilitators (project staff) 10 in number who were responsible for implementation of FFS and the second category was participants and collaborators of FFS 90 in number from six FFS conducted in the taluks of Bagepalli, Kolar, Mulbagal, Madhugiri, Pavagada and Chitradurga (at the rate of 15 per FFS). Suitable interview schedules were developed and used to obtain information from facilitators and participants/collaborators. Relevant information was also obtained from CBTMPCS office (unit responsible for implementation of agreed activities in KCBTMP), University of Agricultural Sciences, Bangalore. The information obtained was analyzed and the major findings of the study are summarized below.

1. Overall implementation process of FFS in KCBTMP was exceedingly well as revealed by higher mean index value (84.18).
2. The planning and execution processes were carried out very meticulously in KCBTMP.

3. The facilitators elicited active participation of participants and collaborators in the whole process of FFS.
4. The expenditure incurred per participant/collaborator in FFS organized in KCBTMP was Rs.1366/-.
5. The FFS participants and collaborators profiles indicated that majority belonged to middle age, lower education, lesser management orientation, lesser cosmopoliteness, lesser organizational participation, smaller land holdings, less irrigation facilities, lesser contacts with extension agencies and lesser mass media exposure. This implied that the participants and collaborators represented typical farmers of three districts.
6. The participants and collaborators possessed higher knowledge on the topics covered in FFS.
7. Majority of the participants and collaborators belonged to medium to higher knowledge level categories.
8. The participants and collaborators had higher symbolic adoption score.
9. Majority of the participants and collaborators belonged to medium to higher symbolic adoption categories.
10. Average yields obtained per ha in FFS plots *Vs* farmers practice were, in hybrid maize, 50 q in FFS against 32.17 q with an increase of 55.42%; in paddy 61 q against 44.74 q with an increase of 36.34%; in ragi 30.20 q against 22.22 q with an increase of 35.91%; in sunflower 22.20 q against 17.00 q with an increase of 30.58%; in tomato 24.45 q against 20.20 q with an increase of 21.03%; and in groundnut 21.70 q against 18.60 q with an increase of 16.66%.
11. Among twelve personal, situational and extension variables considered in the study, only age and irrigation potential were significantly related to respondents' knowledge level. Irrigation potential was positively related where as, age was negatively related. The variables which did not establish significant relationship with knowledge level were education, management orientation, innovative proneness, risk orientation, cosmopoliteness, organizational participation, family size, size of land holdings, contact with extension agency and exposure to mass media.

12. Innovative proneness, organizational participation, contact with extension agency and exposure to mass media have exhibited significant relationship with symbolic adoption of respondents. However, remaining eight variables viz., age, education, management orientation, risk orientation, cosmopoliteness, family size, size of land holdings and irrigation potential did not exhibit significant relationship with symbolic adoption.
13. Facilitators of FFS have expressed that, ensuring the attendance of participants and collaborators in all the sessions, longer duration of session, difficulty for one facilitator to handle a session, difficulty to have more replications and more time consumption for follow-up work were the problems in that order.
14. Participants and collaborators have opined that duration of the session and number of sessions was more. Other wise, crops or subjects selected, scope for them to learn, opportunity for active participation, adoptability of technology and competence of the facilitators were very much appropriate.

Implications

The following implications had arisen out of the findings of the study.

1. The present approach in planning and execution of FFS was found to be good and effective. Hence, it is important to continue the same approach without deviations or distortions.
2. The process of eliciting participation of required participants and collaborators was also found to be very much encouraging. Hence, the same approach be followed by facilitators.
3. The investment per FFS participant was found to be Rs.1,366/-. This indicates that it is a costly method compared to other methods. Nevertheless, it is also an effective method. Therefore, the implementing staff should exercise enough care to make use of this method to achieve desired results including farmer to farmer communication.
4. The impact of FFS was quite impressive in terms of acquisition of knowledge and symbolic adoption behaviour of participants and collaborators. However, the terminal effect could be the adoption of all those technologies

learnt in FFS by all participants. Therefore, efforts should be directed by the project staff by way of effective follow-up action to see that all the participants adopt all the technologies. Also, efforts should be initiated by the project staff to have farmer-to-farmer communication by using FFS alumni in other educational activities.

5. Ensuring attendance of FFS participants and collaborators was expressed as one of the problems or constraints. It is important to adopt motivational strategies like rewarding those who attended all the sessions.
6. Duration of each FFS session (5 hours) was indicted as lengthy. Therefore, it may be essential to reduce by one hour so that the attendance of participants can be enhanced and also interest of the participants in the sessions sustained.
7. Experience sharing workshops can clarify myths and problems of facilitators. Therefore, it may be worth while to organize at least one workshop in the middle of FFS and another one after completion of FFS.

Suggestions for future research

Following suggestions are offered to future researchers based on the experience gained in the process of conducting study.

a. To conduct case studies considering both participants and collaborators for deeper analysis on the cognitive and affective changes taking place among them as a consequence of their involvement in FFS, as well as multiplier effect of FFS.
b. A comparative study of farmers involved in FFS and those not involved in FFS may be conducted for understanding impact of FFS.

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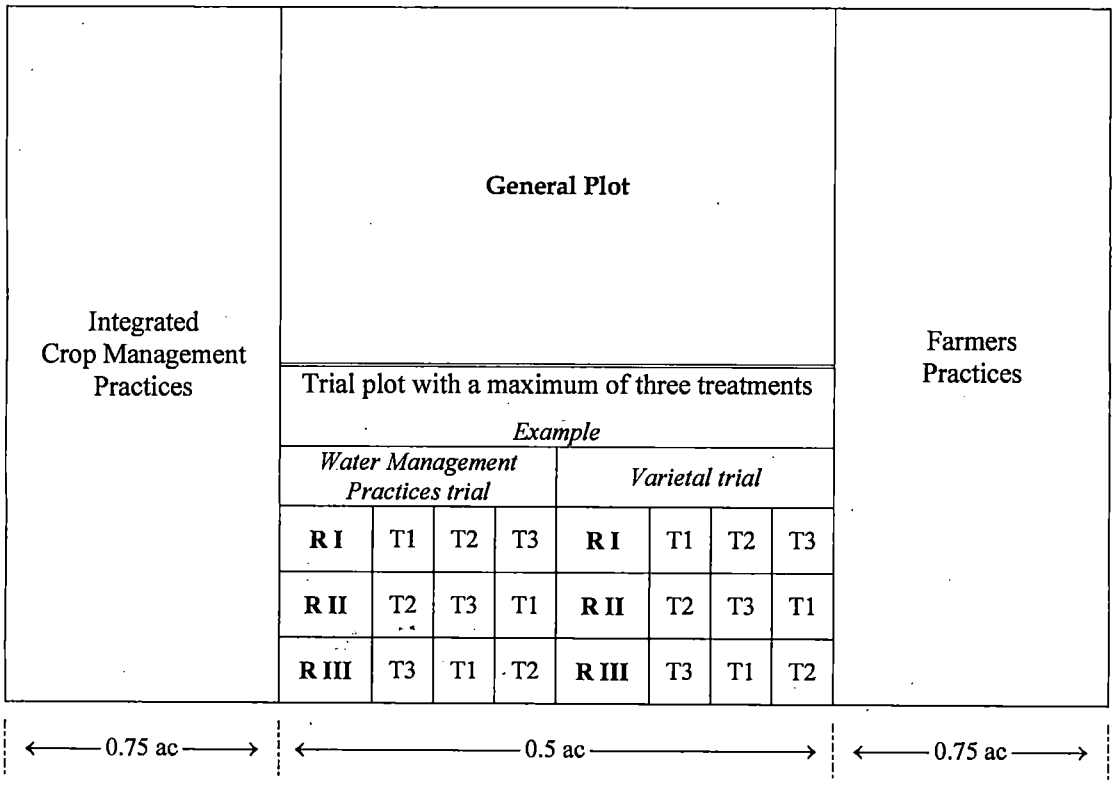
Appendices

Layout of FFS field



Part – I

Interview schedule for data collection from FFS participants / collaborators

I. General Information

i. Name of the respondent :

ii. Age :

iii. Name of the village :

iv. Taluk :

v. District :

II. Information on socio-economic characteristics of respondents

1. Education level

Indicate the level of your formal education

i. No formal education

ii. Primary education

iii. Middle school education

iv. High school education

v. Collegiate education

2. Family size

What is the size of your family?

	Adult	*Children between 12 and 18 years*
1. Male		
2. Female		
Total		

3. Size of land holdings (Area in acres):

Type of land	*Acre*	*Gunta*	*Total*
1. Irrigated land			
2. Garden land			
3. Dry land			
		Grand total	

4. Irrigation potential

Indicate the source of irrigation and extent of area covered under irrigation

Source of irrigation	*Area covered (ha)*	
	Summer	*Other season*
1. Well		
2. Borewell		
3. Canal		
4. Tank		
5. Others		

5. Management orientation

(Please state your response for the following statements agree 'A' or disagree 'DA')

Statement	*A*	*DA*
Planning orientation		
1. It is not necessary to make prior decision about the crop varieties to be cultivated		
2. The amount of seed, fertilizer and plant protection chemicals for raising a crop should be assessed before cultivation		
3. It is not necessary to think ahead of the cost involved in raising a crop		
4. One should not consult on an agriculture expert for the crop planning		
5. It is possible to increase the yield through farm production plan		
6. One should get more benefits through integration of crops in same field		
Production orientation		
7. Timely irrigation can ensure good yield		
8. One should use as much fertilizer as he likes		
9. Determining fertilizer dose by soil testing saves money		
10. Plant population should be as recommended by the specialists		
11. For weed control one should not use herbicides		
12. When water is available in plenty one should use as much irrigation as possible		
Marketing orientation		
13. A farmer can get good price by grading his produce		
14. Market news is useful to farmer		
15. Warehouse can help the farmer to get better price		
16. A farmer should sell his produce to nearest agency irrespective of price		
17. A farmer should purchase input from the shop where his relative/ friend is working		
18. A farmer should go for those varieties, which have more market demand.		

6. Innovative proneness

(Please state your response for the following statements Yes 'Y', No 'N' or undecided 'UD')

	Statement	*Y*	*N*	*UD*
1.	Do you want to learn new ways of farming?			
2.	If the Agril. Extension officer gives a talk on improved cultivation aspects, would you attend?			
3.	If the government would help you to establish a farm else where, would you move?			
4.	Do you want to change in your way of life?			
5.	A farmer should try to farm the way his parents did.			
6.	Do you want to your son to be a farmer?			
7.	It is better to enjoy today and let tomorrow take care of itself?			
8.	A man's fortune is in the hands of god.			

7. Risk orientation

(Please state your response for the following statements agree 'A' or disagree 'DA')

	Statement	*A*	*DA*
1.	A farmer should grow large number of crops to avoid greater risks involved in growing one or two crops		
2.	A farmer should take more of chance in making a big profit than to be content with a smaller but less risky profit		
3.	A farmer who is willing to take greater risk than the average farmer, usually does better financially		
4.	It is good for a farmer to take risk when he knows his chance of success is fairly high		
5.	It is better for a farmer not to try new farming method unless most others in the locality have used it with success		
6.	Trying an entirely a new method in farming by a farmer involving risk, but it is worth trying		

8. Cosmopoliteness

a. Please indicate the number of times you visit the nearest town.
(Two or more times per week/ once in a week/ once in 15 days/ once in a month/ seldom/ never)

b. What generally would be the main purpose of visit?
   i. All visits relating to Agriculture.
   ii. Some visits relating to Agriculture.
   iii. Personal / domestic.
   iv. Entertainment.
   v. Others
   vi. No response

9. Organizational participation

(Please state your response for the following items Regular 'R', Occasional 'O' or Never 'N')

Organization	Member		Office bearer		Participation		
	Yes	No	Yes	No	R	O	N
1. Gram panchayat							
2. Taluk panchayat							
3. Zilla panchayat							
4. Milk Producers Cooperative Society							
5. Farmers Co-op. Society							
6. Mahila mandal							
7. Self help group							
8. Others (specify)							

10. Extension contact

Designation	Aware/ not aware	Frequency of contact			Purpose of contact	
		Often	Sometimes	Regular	Casual	To seek tech. info.
1. Agril. Assistant						
2. Agril. Assistant officer						
3. Extension guide						
4. University Scientists						
5. Veterinary Doctor						
6. Others (Specify)						

11. Mass Media participation

(Please state your response for the following items Regular 'R', Occasional 'O' or Never 'N')

Media	Exposure		
	R	O	N
1. News paper			
2. Krishivignana			
3. Krishiloka			
4. Leaf lets			
5. Radio			
6. Television			
7. Computer			
8. Reshmekrishi			
9. Others (specify)			

III. Impact of FFS

12. Knowledge level of respondents in respect of crops considered in FFS

(Please give details of integrated crop management practices that you have learnt in FFS)

Crop: _____

Sl. No.	*Item*	*FFS participants response*
1.	Improved Varieties	
2.	Spacing	
3.	Organic manures	
a.	Types	
b.	Quantity/Acre (tons)	
c.	Time of Application	
4.	Chemical fertilizer	
a.	Types	
b.	Quantity / Acre (tons)	
c.	Time of Application	
5.	Water management	
a.	Irrigation Layout	
b.	Irrigation Interval	
c.	Critical stages of crop	
6.	Weed management	
a.	Method of Weed cont.	
b.	No. of time weeded	
7.	Disease management	
a.	Name of the important diseases	
b.	Control method followed	
i.	Cultural	
ii.	Mechanical	
iii.	Biological	
iv.	Chemical	
8.	Pest management	
a.	Name of the important pests	
b.	Control methods followed	
i.	Cultural	
ii.	Mechanical	
iii.	Biological	
iv.	Chemical	
9.	Expected yield	
a.	Main product (q/acre)	
b.	By product (Tons/acre)	

13. Symbolic adoption

Do you adopt semi irrigated paddy (Modified Madagascar) cultivation in your field? Yes/No

If yes, give your response to following questions.

1. When do you adopt?
   a. Next season
   b. After two years
   c. After majority of the villagers adopt

2. In how much area you want to grow?
   a. Entire paddy growing area
   b. Very limited area
   c. Half of the paddy area

3. How many technologies considered in FFS you want to adopt?
   a. All the technologies
   b. Few technologies
   c. Any one technology

4. Will you grow semi irrigated paddy?
   a. Without financial support from any source
   b. When partial financial support is obtained from
   c. When compute financial support is obtained

IV. Opinion on FFS

14. Opinion about FFS conducted

(Please give your response for the following items)

Sl. No.	*Item*	*Response*	
		Appropriate	*Needed change*
1.	Crop / subjects considered in FFS		
2.	No. of sessions conducted		
3.	Duration of each session		
4.	Scope for the farmers to learn		
5.	Opportunity for the farmers to participate actively		
6.	Adaptability to other crops		
7.	Competence of the facilitators		

Part - II

Schedule to collect information on FFS from Facilitators (implementers) of KCBTMP

1. Name of the facilitator
2. Educational level
3. Experience
4. Trainings about FFS

I. Planning

1. Basic information on crops grown and problems

Sl. No.	*Crops*	*Problems identified*	*Source of information*

2. Enlisting cooperation of Department of Agriculture (DoA) staff

Sl. No.	*Designation of DoA staff associated*	*No. of visits made by the staff*	*Stages of FFS*

3. Sensitization of TUGs

Sl. No.	*Methodology followed*	*Time of sensitization*

4. Selection of participants

No. of participants selected	*Criteria followed in selection*	*Authority / persons selected*

5. Selection of FFS collaborator

No. of collaborators selected	*Criteria followed in selection*	*Authority / persons selected*

6. Details about the norms developed for FFS

Sl. No.	*Norms*	*Developed by whom?*		
		Field staff of UAS	*TUGs*	*Both*

7. Did Gramasabha approve collaborator, participants and developed norms?

Yes / No

If yes, give details

i) Date of conduct of Gramasabha: _____

ii) Record in he proceedings in the registers or not?

iii) Number of persons present in the gramasabha: _____

8. Steps followed in planning process

a) Problem analysis

Sl. No.	*Problems identified*	*Source of information*

b) Selection of solutions to solve the problems

Sl. No.	*Problems identified*	*Solutions identified*	*How solutions were identified and prioritized?*

Abbreviation

AESA	-	Agro-Eco System Analysis
AIDS	-	Acquired Immune Deficiency Syndrome
CBTMPCS	-	Community Based Tank Management Project Consultancy Services
CFT	-	Cluster Facilitation Team
DoA	-	Department of Agriculture
FAO	-	Food and Agriculture Organization
FFMS	-	Farmers Forest Management Schools
FFS	-	Farmers Field Schools
FLS	-	Farmers Life Schools
GoK	-	Government of Karnataka
HIV	-	Human Immune Virus
INM	-	Integrated Nutrient Management
IPEI	-	Implementation Process Efficiency Index
IPM	-	Integrated Pest Management
JSYS	-	Jala Samvardhane Yojana Sangha
KCBTMP	-	Karnataka Community Based Tank Management Project
LEISA	-	Low External Input Sustainable Agriculture
NGO	-	Non-Governmental Organization
PRA	-	Participatory Rural Appraisal
PTD	-	Participatory Technology Development
SHG	-	Self Help Group
SWOT	-	Strengths, Weakness, Opportunity and Threats
TUC	-	Tank Users Committee
TUG	-	Tank Users Group
TV	-	Television
UAS (B)	-	University of Agricultural Sciences, Bangalore
UNDP	-	United Nations Development Programme