BIBLIOGRAPHY

LUZVIMINDA M. PALENGLENG, October 2009. *Factors Affecting the Implementation of Farmer Field School on Integrated Pest Management in the Cordillera Administrative Region.* Benguet State University, La Trinidad,
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ABSTRACT

This study assessed the factors affecting the implementation of FFS-IPM in the Cordillera Administrative Region. The result can be used as basis in developing relevant follow up and upscaling activities for the FFS Program.

Fifty three active trainers and 150 farmer graduates from 1993-2008 were interviewed in 22 municipalities in all the provinces of CAR. Semi-structured interviews, focused group discussions and triangulation were used to collect data, and data were subjected to qualitative analysis, descriptive statistics and correlation analysis.

Most trainer respondents are middle aged (41 – 55 years); more females;
81% were college graduates, 19 had masters degrees in nine different disciplines;
74% graduated from TOT, 21% from TOS, and 6% from crush courses. Each trainer implemented an average of seven FFS in three years; 75% attended FFSIPM related training courses and workshops. Majority of the farmer respondents were 41 – 55 years old and literate with a minimum of high school level education. Farmers saved 54.97% on the cost of pesticides, 51.90% on fertilizers, and 43.20% on cost of labor. About

16.19% of farmers reported increase in production, 16.68% increase in income, and 15.56% increase in profit.

The motivating factors of trainers in implementing FFS-IPM, in a descending order, were to produce safe food, restore and preserve beneficial organisms, reduce chemical inputs, enhance biodiversity, increase income and profit of farmers, and the opportunity to regularly meet other farmers. The reasons for implementing the FFS were to learn and share knowledge and skills with farmers, train farmers in IPM by research, to respond to office mandate, and a few were challenged to test their ability as trainers of IPM. Three motivational factors namely: higher income and profit of farmers, safer food production, and the enhancement of biodiversity significantly influenced the adaptability, appropriateness and relevance of the features and characteristics of FFS-IPM. The more motivated the trainer to effect higher income and profit by the farmers, the lesser was their adaptability of the FFS – IPM features and characteristics; the more motivated the trainer to effect the enhancement of biodiversity, the higher was their adaptability; and the more motivated the trainers to effect the production of safe food by the farmers, the higher the perceived relevance are the features and characteristics of FFS-IPM.

The overall degree of adaptability of the features and characteristics was moderate; the degree of appropriateness and relevance were both high. Number of participants, time of the day, number of hours, and the conduct of insect/disease zoos were consistently rated moderate on adaptability, appropriateness and relevance. High degree of adaptability was noted with trainers from Benguet, Ifugao and Kalinga, moderate from Abra, Apayao and Mt. Province. High level of appropriateness was noted with trainers from Benguet, Ifugao, Kalinga and Mt.

Province; moderate from Abra and Apayao; and high degree of relevance from Apayao, Benguet, Ifugao, Kalinga and moderate from Abra and Mt. Province.

The effects of FFS on the income and profit as well as the adoption of IPM technologies were moderate.

Gender, season long training in FFS-IPM on vegetables and rice, and attendance to FFS-IPM related workshops significantly affected adaptability, appropriateness and relevance of the features and characteristics of FFS-IPM.

Females had higher adaptability than males. More attendance to season long training on FFS-IPM of vegetables and rice, the less appropriate are the features and characteristics of the FFS-IPM. The more attendance to season long training in vegetables, the less relevance was perceived. More attendance to consultation workshops, the lesser was appropriateness perceived.

Farmers attended FFS basically to learn new things, to get support or material things after the training, due to influence of neighbors, and as inspiration to others. The major motivations in applying knowledge and skills gained were higher income and profit, safer food, reduced cost of pesticides and reduced cost of fertilizers. Degree of knowledge and skills applied differed: Abra, Apayao, Benguet, and Kalinga had moderate level of application; and weak application in Ifugao and Mt. Province.

Significant differences existed among the provinces in changes made on the time of day, number of hours, subject matter, research design, and conduct of insect/disease zoo. Number of hours, subject matter, research theme, and field monitoring were modified. Suggestions for modifications were on methodology, subject matter, duration, insect/disease zoo, research design, AESA and the number of hours. Topics suggested for

future FFS were organic farming, soil fertility management, and integrated pest management.

Based on the findings and conclusions, the following are recommended:

Younger FFS core trainers with appropriate fields of specialization, and with potential skills and competencies for development are needed.

FFS–IPM has widespread benefits accruing to public health, environmental protection, economy and education. The program should therefore be placed in a broader rural development perspective. The DA can lead by pooling multi-sectoral resources to support a comprehensive program on safe food production.

Though the program is LGU-led, the DA is still recognized as the source of fund. Thus, DA should institute a strong monitoring and evaluation scheme; treat FFS as a developmental program; and use graduates of FFS as partners in implementing agriculture interventions. This way, confusions by the agriculture technicians and the farmers about programs and projects implemented by the DA is corrected.

The following have to be re-examined to improve the quality and cost effectiveness of the training program: the duration, number of participants, time of day, number of hours, and conduct of insect/disease zoos; and the causes of the differences in the degree of implementation among the provinces. The DA should accept training and workshop participants only where it is strategically important, and where the training effort can have maximum effect.

To sustain the attendance of farmers, the objectives and goals of the program should be clear, and understood during the ground working activities.

Trainers must have new and relevant information for every session to maintain the interest of farmers.

An exit plan should be developed with FFS-IPM graduates. The LGUs should develop mechanisms to keep track of agricultural production management practices of farmers. Farmers can also be encouraged to pay acceptable training costs, so farmers will better appreciate learning and improve their knowledge and skills.

The specific suggestions and comments concerning the implementation of FFS-IPM with regards the features and characteristics should be evaluated further for their usefulness to the program.

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INTRODUCTION

Background of the Study

The Farmer Field School (FFS), a participatory training and research approach started in Southeast Asia twenty years ago. Since that time, FFS rapidly spread globally due to the positive impacts experienced by most countries that used it. The FFS has drawn widespread enthusiasm from international donors to use the strategy as a platform for rural development. In 2008, Palengleng noted that FFS was used as a conduit to develop livelihood, rural enterprises, and small-scale commercial agriculture development projects. FFS fostered rural development and encouraged attainment of critical mass to upscale the economic status of farmers. The FFS sets out to educate local people to enhance their capability for informed decision-making in response to what are always context-dependent pest problems, and thus also for adaptive management (Van den Berg, 2004).

FFS started as a crop-based Integrated Pest Management (IPM) - promoting strategy. But now, FFS methodology is used for a wide range of rural (and even urban) learning activities (Global FFSNet, 2008).

The FFS is described as a "school without walls" (IIBC, 1996), and based on adult education principles. It is a continuous one-season-long hands-on, experiential participatory training and research activity that builds on processes of

group learning and experimentation. It also serves as a venue by which farmers and trainers share their personal experiences, observations and concepts on crop production management. Thus, FFS creates a more scientific understanding of the crop or livestock agro-ecosystems. A summary of the definition of FFS from various sources indicates that FFS is a "down-to-earth" participatory activity for training and research that is facilitated by skilled trainers with farmers themselves making crop management decisions. This ultimately leads to better understanding about safe food production while increasing income and profit by the farmers and enhancing biodiversity.

The FFS was first introduced in the Philippines in 1992 for IPM in rice husbandry, patterned from Indonesia's experiences in 1989. In 1993, FFS in vegetable production was first piloted. This vegetable FFS project was a multi-sectoral endeavor, and supported by the United Nations Food and Agriculture Organization (UNFAO), the Highland Agriculture Development Project-Department of Agriculture (HADP-DA), Cordillera Administrative Region (CAR), and with the cooperation of the Local Government Unit (LGU) of Atok, Benguet. From this modest start, FFS has grown into a self - reliant national program that is wholly funded from the national government's resources equivalent to about US$3.0 million annually (Binamira, 2001).

Pursuant to Memorandum Order 126 of May 1993, The National IPM Program locally dubbed as *Kasaganaan ng Sakahan at Kalikasan* or

KASAKALIKASAN served as the legal basis for implementing the FFS on IPM in the Philippines. This makes IPM as the standard approach to crop husbandry, and using the FFS approach. Today, the program has expanded, not only to other major crops such as rice, corn, vegetables, and fruit trees, but also to other industries like animal production, agro-forestry, and child nutrition. FFS is also integrated into the curriculum of some vocational arts courses.

For the past 18 years since FFS was introduced to the Philippines, the name of the program and the implementation procedures have not changed even with the frequent changes of administration in both local and national government units. It is also one of the government program interventions that has reached the far-flung rural communities, even those without roads, and accessed only by foot trails.

The agriculture technicians from the Local Government Units (LGUs), are tasked to make proposals and conduct FFS in their respective areas. These FFS agricultural technicians graduate from a one-season-long "Training of Trainers (TOT) or Training of Specialist (TOS) in Farmer Field School on Integrated Pest Management". Thus, the direct implementation of FFS is the responsibility and work of trained agriculture technicians in the local government units. In CAR, Visayan (2003) claimed that all FFS trainers have high managerial competence in terms of planning, directing, decision making, resource management, planning and preparing budgetary requirements for the project. On the average, one FFS-

IPM trainer facilitated a total of seven batches of farmer field schools in his entire period of conducting FFS (DA - RFU, CAR, 2004).

Although the implementation of FFS in the Cordillera Administrative Region is continuing, a steady decline is observed in the number of FFS conducted in all the provinces since 1993 up to the present (Figure 1). Some of the reasons in the decline can be attributed to the decreasing number of trained FFS trainers due to mandatory change of duties and responsibilities of trained LGU agriculture technicians to other offices as an effect of promotion, transfer of assignment and retirement as observed in the profile of trainers (ATI-CAR, 2008).

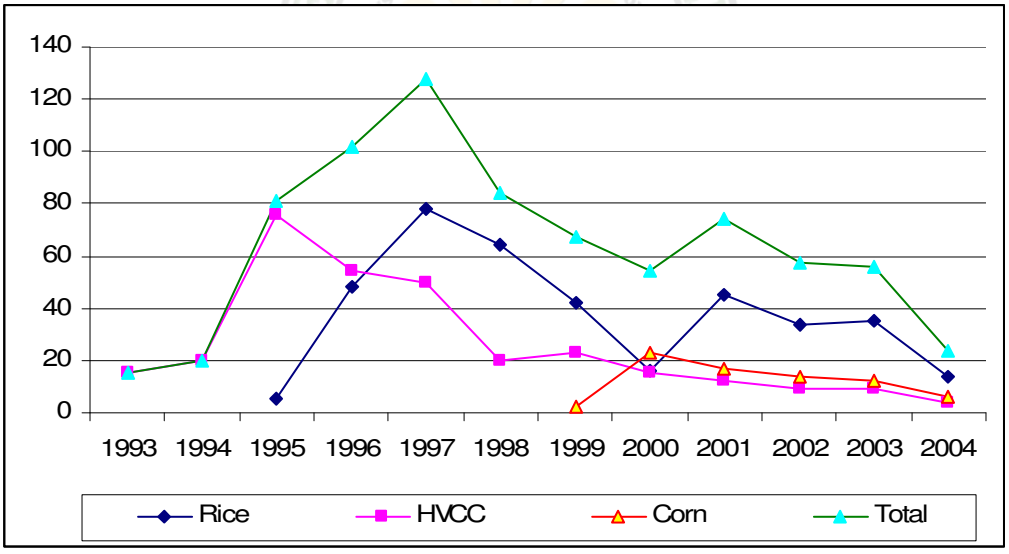


Figure 1. Trend in the implementation of FFS in the Cordillera Administrative Region from 1993 to 2004 (Source: DA-RFU, CAR)

Other trainers simply stopped conducting FFS. They claimed that they did not have support from their local executives or from other concerned institutions. Motivation can increase productivity level in several times and that highly motivated workers can produce up to 15% more goods and services under the same work conditions as their non or less-motivated co-workers (http://www.essay-911.com/samples/Theories.htm, 2009). Along this line, it is important to know what motivates the remaining few trainers to persistently conduct FFS.

Moreover, with the widespread use of FFS for numerous crops, livestock, agroforestry, in child nutrition, at various agro-ecological systems; diverse socio–cultural and economic situations; and different constraints and purposes may have led to innovations or variations in the process. These innovations need to be noted and re-examined in terms of their: a) positive contributions to the further development of the approach, b) the extent to which they reflect the core principles underlying FFS and IPM, and c) efforts to maintain the quality of the program.

A number of earlier studies delved much on evaluating FFS impact and focused on the farmers and the FFS program itself. However, sentiments of direct implementers and the agriculture technologists also have to be known and have to be heard. It is therefore imperative that after 18 years of implementing the FFS – IPM as a farmer participatory training and research approach, there is a need to

assess the factors affecting and influencing FFS implementation as experienced by the farmers and from the viewpoint of the trainer – facilitators to meet changing environments.

Pontius *et al*. (2002) mentioned that leading an FFS appears easy in the hands of an experienced facilitator/trainer. The key is confidence and this only comes with experience. Facilitation by the trainer is one aspect that affects implementation when facilitators feel they lack technical knowledge, that leads to lack of self confidence resulting to lecturing; mastery of the facilitation skills is needed to conduct an FFS; and inadequate support and supervision by concerned trainers. In Bangladesh, CARE discovered that most of their Farmer IPM trainers found social recognition to be more important than the potential of earning money as farmer IPM trainers. Money is not the most important motivational issue.

Damag as cited by Legaspi (1995) mentioned that higher income is not necessary for farmers to be able to later adopt technologies. Farm size, family income, capital source do not affect adoption of technology. The low level of farmer education is a significant factor to extension work and the low educational attainment is associated with conservatism and reluctance to accept new improved technology. The institutional environment, commercial chemicals, extension support incentives and logistics play a vital role in the technology adoption process (Drabick as cited by Legaspi, 1995).

In view of the foregoing, the results of this study may provide information and clues on how to re-energize the program and improve the quality of the training. The "technology transfer" approach to agricultural extension continues to decline due to limited success (Gallagher *et al*., 2009). In its place, FFS is part of the growing interest in "Education for All" and continuing education. And the current trend of FFS moving outside the scope of agriculture is expected to continue. The adaptation of FFS principles, features, and characteristics is needed to look at gaps in the implementing process.

Moreover, findings of this study can be used as basis in developing relevant follow-up and upscaling activities for the FFS program. Is it expected that the results of this study will provide vital information in FFS implementation to enhance better adoption of IPM technologies.

Conceptual Framework

FFS Implementation

The direct implementation of FFS is done by trained agriculture technicians in the local government units who are equipped with the knowledge and skills in running the program. The process by which FFS is implemented observes the principles, features and characteristics of IPM – FFS that served as the standard protocol. This entails a rigid series of preparatory activities like budget approval by local executives, community organization, procurement of

supplies and materials, preparation of learning materials during sessions, and preparing and facilitating weekly activities.

FFS is a dynamic, rather than a static process. Owing to its principles and features, by design, its implementation needs much time, patience and effort by the implementer to complete a continuing one crop-season research and training course. There are unrecorded allegations, comments, and feedbacks alleging that the "standard" process is not being followed. The question is, do the deviations really diminish the quality of the FFS process? do these modifications result in a better FFS due to the innovativeness of the trainer-facilitator? Cottingham (1998) stated that the danger with standardization is distortion from the basic principles. Clearly, it is difficult to define what constitutes distortion as opposed to creative adaptation/evolution. The data gathered from this study would be used as input to develop upscaling activities for FFS.

Archer (1997) reported that the most effective approach at the trainer-facilitator's level is that, the trainer-facilitators have to be actively engaged in formulating their own techniques; taking ownership of the approach and internalizing it. Without this internalization, they will have a very limited ability to effectively facilitate a process to others.

With respect to FFS farmer-graduates going back to "conventional" farming, it was stated during a Global FFS forum in 2008 that FFS is not in all cases the most effective or efficient approach, but rather a learning tool and not a

purpose of its own (Global FFSNet, 2008). Schueneman (1992) mentioned that production - related pest management is extremely important and constantly changing. These remarks give ideas as to whether the lessons learned are still practiced and adapted by the farmer graduates as time goes by. There are reportedly thousands of farmer- graduates of FFS - IPM in rice, corn, vegetables and other commodities. But regardless of the number of graduates, the adaptability of lessons learned at present has not been documented up to this day. Finding out the state of adaptation of lessons learned by the farmers can give further insights for the improvement of the FFS process.

Other factors that may affect the implementation of the FFS process may include age, sex, educational background, field of specialization, professional experiences of trainers and the trainer – facilitators themselves.

The basic implementation guidelines and schedules are perceived by some as too rigid – not allowing flexibility (Gallagher *et al*., 2009). Working on the core principles of participation and adult learning, there are lots of innovative FFS applications coming out of the work of skilled FFS trainer – facilitators. Any innovation, deviation and modification as a result of the adaptability to local circumstances serve as continuing challenges needed for an effective FFS program implementation.

IPM – FFS Principles

The implementation of FFS is anchored and guided by the IPM and FFS principles, its features and characteristics that make it unique from any conventional extension, training and research methods.

IPM principles (KASAKALIKASAN):

1) Grow a healthy crop,

2) Conserve natural enemies,

3) Observe the field regularly, and

4) Farmer become expert in their own field

The FFS principles according to Medina and Callo, 1997; and IIBC, 1996 mention that:

1) The field is the primary learning resource. All learning activities take place in the field or are based on what is happening in the field. The field therefore, becomes the main reference, the primary learning material, and focus of learning.
2) Experience forms the basis of learning. All learning is based on farmers' experiences in the field. Activities that take place in the field form the basis of discussion and analysis by farmers who arrive at concepts which they test and improve through further field activities.

3) Decision-making guides the learning process. FFS focuses on the analysis of the agro-ecosystem of the crop. Such analysis help farmers gain insight into the ecological interactions in the field.

4) Training last throughout the entire growing season of the crop. The IPM "field school" lasts through out the entire growing season of the crop. Farmers acquire a firm understanding of the relevant IPM concepts for each stage of the crop, from planting to harvesting.

5) The curriculum is detailed and coordinated with local conditions of the field school. The field school curriculum is based on the materials used for the IPM training of trainers (TOTs). The materials selected are based on the appropriateness to the field school, the local condition of the field, and the problems and needs of FFS farmers.

Features and Characteristics of Farmer Field School (KASAKALIKASAN Program Document, 1994, and Palengleng, 2008):

Features and Characteristics:

1. Methodology	-	discovery based, hands-on, experiential, use of guide questions and facilitation techniques
2. Duration	-	Season-long, one crop cycle - planting to harvesting, meet ½ day per week
3. No. of Hours and Time of Day	-	Half day and morning sessions
4. No. of Participants	-	25-30 farmers

5. Venue	-	Study plots as main learning resource, discussions under a shade near study plots
6. Curriculum	-	Based on TOT material for IPM
7. Subject Matter	-	IPM focused on Integrated Pest Management, Integrated Nutrient Management
8. Number of Trainers	-	at least 2 trained trainer facilitating one FFS
9. Field Monitoring Technique	-	Conduct of weekly AESA
10. Research Theme	-	Farmers' Crop Protection Practices versus IPM Practices
11. Conduct of Field Day and Graduation	-	Normally at harvesting time

The study assumes that the FFS process is complex and dynamic. Many factors or variables determine whether the underlying principles, features and characteristics of FFS – IPM are still adaptable, appropriate, and relevant to address the effects of a changing environment and the needs of farmers for better incomes and profits.

Figure 2 illustrates the schematic diagram of the study. This shows the relationship of the independent, the dependent variables as well as the intervening variables.

The independent variables which consist of the IPM – FFS principles, features and characteristics are assessed and measured in terms of their

adaptability, appropriateness and relevance to future FFS implementation and their influences on the application of IPM technologies. According to Pontius *et al.* (2002), FFS has a standard model which establishes a norm for the implementation of an FFS. There is plenty of room for variation as long as the resulting process is learner-centered, participatory and relies on an experiential learning approach. There have been variations in the standard rice IPM FFS model and different situations call for adaptations. When an FFS is conducted in a crop other than rice, there are necessarily changes based on factors such as the key growth stages of the crop, local cropping patterns and specific local problems. Any FFS should rely on the same process; it is the content that changes as the FFS is conducted with different crops. The core principles, features and characteristics underpin any FFS - IPM. The variations in the FFS - IPM models are affected by the intervening variables; the trainers' as well as the farmers' socio-economic and motivating factors.

The effectiveness of the FFS-IPM principles, features and characteristics are determined according to their adaptability, appropriateness, and relevance to farmers or groups of farmers which are mentioned as low, moderate or high. The extent by which the FFS-IPM principles, features and characteristics are implemented are influenced by the trainers' and farmer trainees' socio-economic backgrounds and motivations. The changes or innovations made were identified as no change or modified.

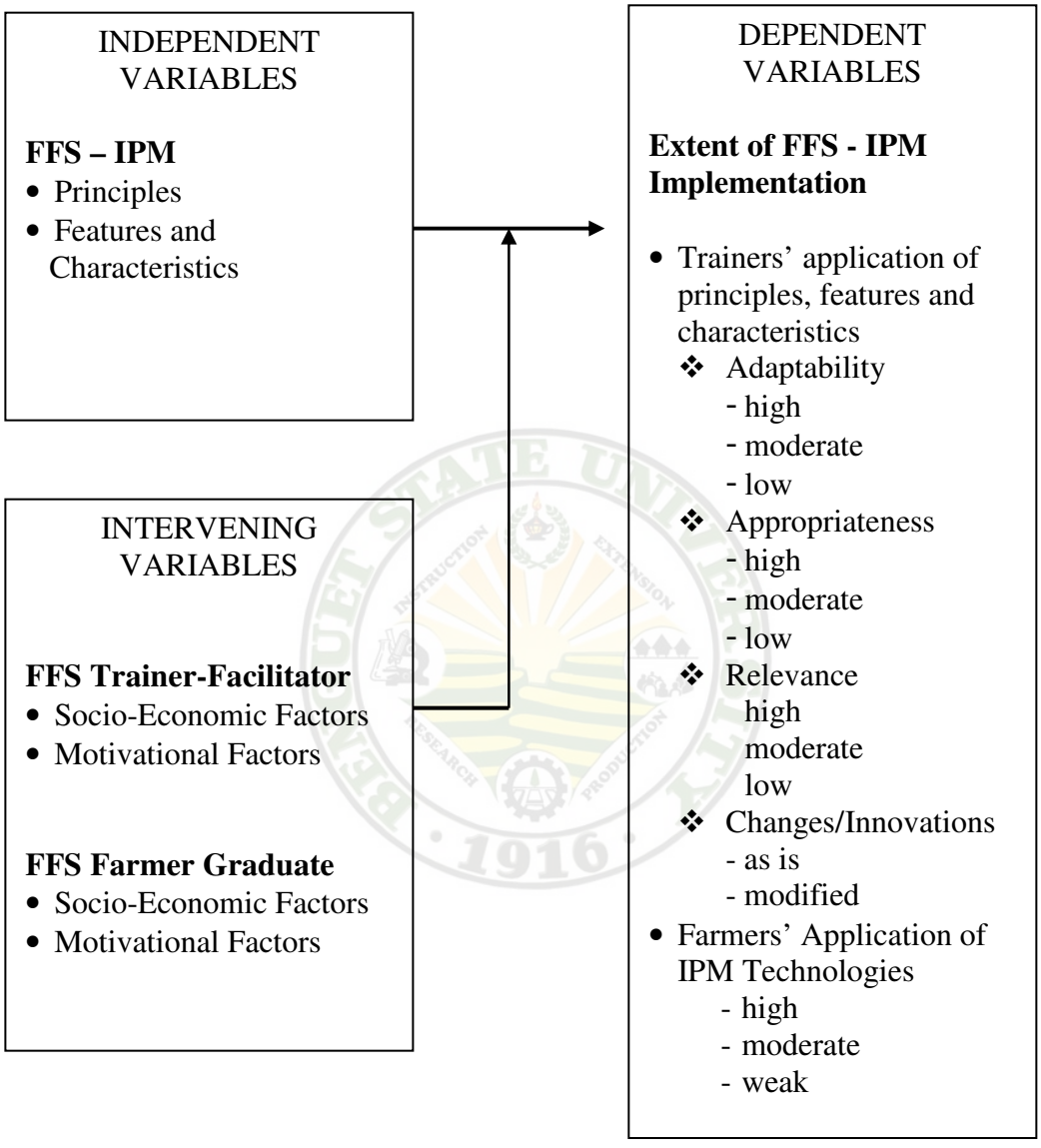


Figure 2. Paradigm of the study

Statement of the Problem

The study determined the factors affecting the implementation of Farmer Field School Integrated Pest Management in the Cordillera Administrative Region.

This study aimed to provide answers to the following questions:

1. What is the profile of respondents?

2. What is the relationship between the motivating factors and the extent of FFS implementation, and the reasons in implementing the FFS approach?

3. What is the extent of FFS implementation along adaptability, appropriateness, relevance of the principles, features and characteristic of IPM – FFS with respect to: a) Methodology; b) Duration of the Training; c) Number of Participants; d) Time of Day; e) Number of Hours; f) Subject Matter; g) Sequence of the Activities; h) Research Theme; i) Research Design; j) Field Monitoring Techniques – Weekly AESA; k) Conduct of Insect/Disease Zoos; l) Conduct of Field Day and Graduation; and m) Calculation of Incomes and Profits and the perceived effects to income and profits as well as the application of IPM technologies?

4. What is the relationship between the socio-economic factors and the extent of FFS implementation?

5. What are the reasons of farmers in attending FFS sessions, motivations in applying the knowledge and skills gained from the FFS training, and degree of application of learning?

6. What is the degree of change in the FFS features and characteristics?

Hypotheses of the Study

Based on the specific problems, the following hypotheses are put forward for testing:

1.a) There are no significant differences in the motivating factors and reasons in implementing FFS;

1.b) There is no relationship between the motivating factors and the extent of FFS implementation;

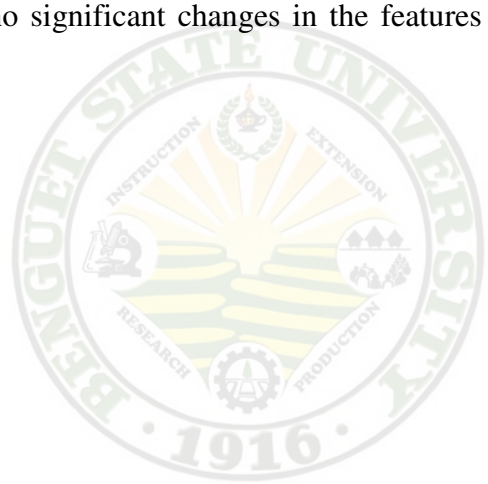
2. The are no significant differences in the extent of FFS - IPM implementation in terms of the adaptability, appropriateness, and relevance of the principles, features and characteristic of IPM – FFS with respect to: a) Methodology; b) Duration of the Training; c) Number of Participants; d) Time of Day; e) Number of Hours; f) Subject Matter; g) Sequence of the Activities; h) Research Theme; i) Research Design; j) Field Monitoring Techniques – Weekly AESA; k) Conduct of Insect/Disease Zoos l) Conduct of Field Day and Graduation; and m) Calculation of Incomes;

3. There is no relationship between the socio-economic factors of trainers on the extent of FFS implementation;

4.a) There are no significant differences between the reasons in attending the FFS sessions and the motivational factors in adopting the learning gained from FFS training;

4.b) The level of application of learning by the IPM – FFS farmer graduates is significantly higher than low adoption;

5. There are no significant changes in the features and characteristics of FFS.



METHODOLOGY

This section presents the research design, population and locale of the study, data collection instruments, data collection procedures and treatment of data.

Research Design

The study used statistical computations to determine correlations using both quantitative and qualitative data. This design enabled the researcher to establish any relationships that existed to influence the hypothesized extent of FFS implementation. Both the quantitative and qualitative approach helped the researcher to look at any suggestions in improving future FFS.

Population and Locale of the Study

There were two groups of respondents in the study. The first group consisted of 53 trainers or 43% of the active trainers who conducted FFSs and who were trained either in the Training of Specialists, Training of Trainers or Crash Courses. The second group comprised of 150 FFS farmer graduates from 1993 to the present and who were trained in the different commodities. The breakdown of respondents in each province is shown in Table 1.

Table 1. Distribution of respondents by province and municipality

PROVINCE	MUNICIPALITY	NUMBER	
		Trainer	Farmers
Abra (OPAg)		2	-
	Bangued	1	6
	Lagangilang	1	5
	La Paz	1	7
	Pennarubia	1	3
	Pidigan	1	3
Apayao (OAS)		1	-
	Luna	4	10
	Pudtol	1	5
	Sta Marcela	-	5
Benguet (OPAg)		1	-
	Atok	3	8
	Kibungan	-	4
	Trinidad	3	2
	Tuba	2	9
Ifugao (PAENRO)		5	-
	Alfonso Lista	4	23
	Kiangan	-	3
	Lamut	1	-
Kalinga (OAS)		1	-
	Pinukpuk	1	5
	Rizal	2	6
	Tabuk	8	24
Mt. Province (OPAg)		4	-
	Bauko	2	6
	Bontoc	2	11
	Natonin	1	4
	Tadian	-	1
	Total	53	150

The study covered the six provinces of the Cordillera Administrative Region (Figures 3 and 4). The provinces of Benguet and Mt. Province are the major semi-temperate vegetable growing areas that supply 70% of the total vegetable needs of the country (Cheng and Bersamira, 1997). Kalinga is known as the rice granary of CAR and also has considerable corn production. The provinces of Apayao, Ifugao and Abra produce rice and corn as their main agricultural commercial crops.

According to DA-RFU, CAR (2009), the Cordillera Administrative Region conducted two Training of Specialists (TOS) on IPM – FFS of Vegetables. These were held in Mt. Province and Benguet in 1994 and 1995 to train a core of vegetable FFS – IPM Specialists. Another two Training of Trainers (TOT) on IPM of Vegetables were conducted in Benguet in 1994 and 2001 to capacitate the local government units (LGU) agriculture technologists. Four TOT on FFS - IPM for rice were hosted in the provinces of Kalinga, Apayao, Ifugao and Abra in 1995, 1996, 1997, and 2000 respectively. Lastly, one TOT on FFS - IPM for Corn was conducted in Ifugao in 2003. Participants of the above courses came from the local government units' agricultural services in the provincial and municipal levels as well as from the national government agencies.

Figure 3. Location of the study area (Cordillera Administrative Region) in the Philippines

Figure 4. Map of the study area - The Cordillera Administrative Region

The computation of the sample size relative to the population used the following formula (Broto, 2008).

Formula:

$$n = \frac{N}{1 + Ne^2}$$

Where : n = sample size

N = population size

e^2 = margin of error

Data Collection Instrument

A survey questionnaire was used to collect information needed for the quantitative portion. It consisted of a combination of structured and open ended questions. Guided questions were also used to gather relevant information needed for the qualitative portion. Secondary data were sourced-out from printed documents, internet and books to compliment data collected.

The quantitative data covered socio-economic factors; trainers' experiences, FFS related trainings attended and facilitated; motivational factors in conducting FFS as well as the adaptation of learning from the FFS training and research by the farmer graduates. In some instances, these data were validated through informal group and individual discussions. Key informants interviews, and informal group discussions were used in the qualitative approach.

The survey forms or questionnaires were pre-tested in Kalinga. The questionnaires were then revised according to the comments and responses of the respondents. Items found irrelevant were deleted, while some questions were modified to facilitate easy responses from respondents.

All primary data were collected using a pre-tested questionnaire (Appendices B and C). These instruments covered all the variables analyzed in relation to the hypotheses of the study. The instrument was categorized as follows:

Part 1 – this portion covers three sections:

a) Socio – economic aspects (age, sex, education, field of specialization, position in governments office, and current designations);

b) FFS experiences (type of training attended, year graduated from training, number of years conducting FFS, and number of FFS conducted);

c) FFS training, related trainings attended (kind of commodity during, training attended, number of FFS training courses attended; number of FFS related consultation and workshops attended, and number of training and workshops facilitated.

Part 11 – Motivational factors and reasons in implementing FFS approach for training and research.

Part 111 – Extent of FFS – IPM implementation of the FFS-IPM features principles, and characteristics in terms of the adaptability, appropriateness,

relevance, adherence and FFS effect on the income and profit of farmers and adaptability of IPM technologies

Part IV – Degree of application of knowledge and skills gained from the training by farmers.

Data Collection Procedures

The first level of data collection was done at the regional level where the IPM Program (KASAKALIKASAN) documents were accessed and reviewed for relevant information needed. Data pertaining to the list of IPM – FFS training activities and the list of graduates were obtained from the regional IPM-FFS coordinating unit office, regional field unit of the Department of Agriculture – CAR. These data served as the basis in determining the respondents from the provinces. The trainer respondents were selected based on the following criteria: a) must be a graduate of a season long training of either TOS, TOT or crash course on IPM – FFS of any commodity, b) must have implemented Farmer Field School after graduating from the season long training, and c) is still connected with the agriculture sector. Please take note that not all graduates of any of the above season long training implemented FFS after their training. The farmer respondents were randomly selected from the FFS conducted by the trainer respondents.

Letters asking permission to collect data and request for assistance from the trainer in collecting data from farmers were delivered to the Provincial Agriculturists in selected municipalities. Another letter to the identified trainer - respondents was attached to the individual set of questionnaires. The second level of data gathering was the conduct of interviews with trainers.

The third level was the data collection with the farmers. Generally, groups of farmers from a place were assembled, and interviews were done at one time. The respondents fill up the form as interviewers guide the process. Short group discussions were done after the filling up of forms to gather qualitative information.

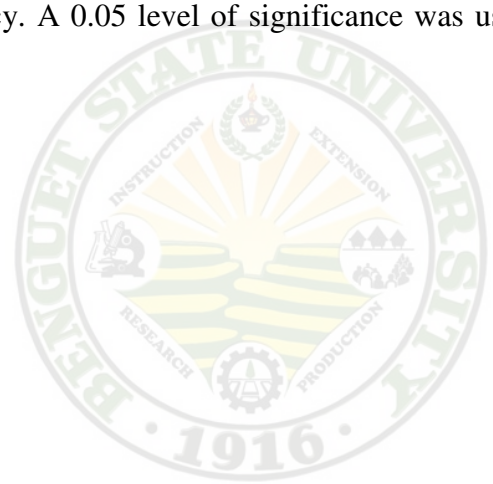
Treatment of Data

The data were tabulated and categorized. Descriptive statistical tools such as frequency distribution, percentages, ranking, and weighted mean were used. To test the significant differences of the means, Cochran's Q-test, and analysis of variance were used with the SPSS program. The Cochran's Q-test was applied in determining the respondents' motivational factors and reasons in implementing the FFS and the suggestions for modifications and topics for the upscaling of FFS activities.

The analysis of variance was employed in the comparison of the extent of FFS implementation in terms of the adaptability, appropriateness and relevance of

the features and characteristics of FFS - IPM and IPM technology adaptation by provinces. The values under the F-distribution served as basis for rejecting or accepting the hypothesized extent of FFS implementation. Thus, the hypothesized value is rejected if Fc is lesser than 0.05 level of significance otherwise, the hypothesized value is accepted.

The respondents' extent of FFS implementation was correlated to selected social and motivational factors with the use of Point Biserial correlation analysis to test for coefficiency. A 0.05 level of significance was used in all the analysis made.



RESULTS AND DISCUSSION

This portion of the study answers the following specific problems:

1. What is the profile of respondents?

2. What is the relationship between the motivating factors and the extent of FFS implementation, and the reasons in implementing the FFS approach?

3. What is the extent of FFS implementation along adaptability, appropriateness, relevance of the principles, features and characteristic of IPM – FFS with respect to: a) Methodology; b) Duration of the Training; c) Number of Participants; d) Time of Day; e) Number of Hours; f) Subject Matter; g) Sequence of the Activities; h) Research Theme; i) Research Design; j) Field Monitoring Techniques – Weekly AESA; k) Conduct of Insect/Disease Zoos; l) Conduct of Field Day and Graduation; and m) Calculation of Incomes and Profits and the perceived effects to income and profits as well as the application of IPM technologies?

4. What is the relationship between the socio-economic factors and the extent of FFS implementation?

5. What are the reasons of farmers in attending FFS sessions, motivations in applying the lessons learned from the FFS training, and degree of application of learning?

6. What is the degree of change in the FFS features and characteristics?

Profile of Respondents

Socio-Economic Profile

Sex, age and civil status of trainers. There were more female respondents (58.49%) than males (Table 2). The female ages ranged from 35 to 61 years, while the males ranged from 37 to 59 years old. More than 24 % of the male respondents were in the age bracket of 41- 45 years old. This was followed by a 20.75 % age bracket of 46 – 50 years old. There were more middle aged FFS trainers than the younger ones. For the civil status, there is only one single trainer respondent.

In table 3, there were more female farmer respondents (54 %) than males (46 %). Most of the farmers were in the 46 -50 age bracket (26.67 %), followed by age ranging from 51 – 55 (23.33 %) and 41 – 45 (16.67%).

Comparing the age range of the two groups of respondents, Figure 5 shows a bell-shaped normal population distribution where most of the respondents were of middle ages (41- 45 and 46 – 50 years old), with fewer younger ages (23 – 40 years old) and older respondents (56 – 70 years old) involved in the FFS training and research activities.

Table 2. Age and sex of trainer respondents

AGE BRACKET	FREQUENCY		TOTAL	PERCENT
	FEMALE	MALE		
30 – 35	2	0	2	3.77
36 – 40	3	5	8	15.09
41 – 45	6	7	13	24.53
46 – 50	7	4	11	20.75
51 – 55	7	4	11	20.75
56 – 60	5	2	7	13.21
61 – 65	1	0	1	1.89
Total	31	22	53	100.00
Percent	58.49	41.51		

Table 3. Age and sex of farmer respondents

AGE BRACKET	FREQUENCY		TOTAL	PERCENT
	FEMALE	MALE		
23 – 29	2	1	3	2.00
30 – 35	5	3	8	5.33
36 – 40	7	5	12	8.00
41 – 45	12	13	25	16.67
46 – 50	18	22	40	26.67
51 – 55	20	15	35	23.33
56 – 60	11	7	18	12.00
61 – 65	2	2	4	2.67
66 – 75	4	1	5	3.33
Total	81	69	150	100.00
Percent	54.00	46.00		

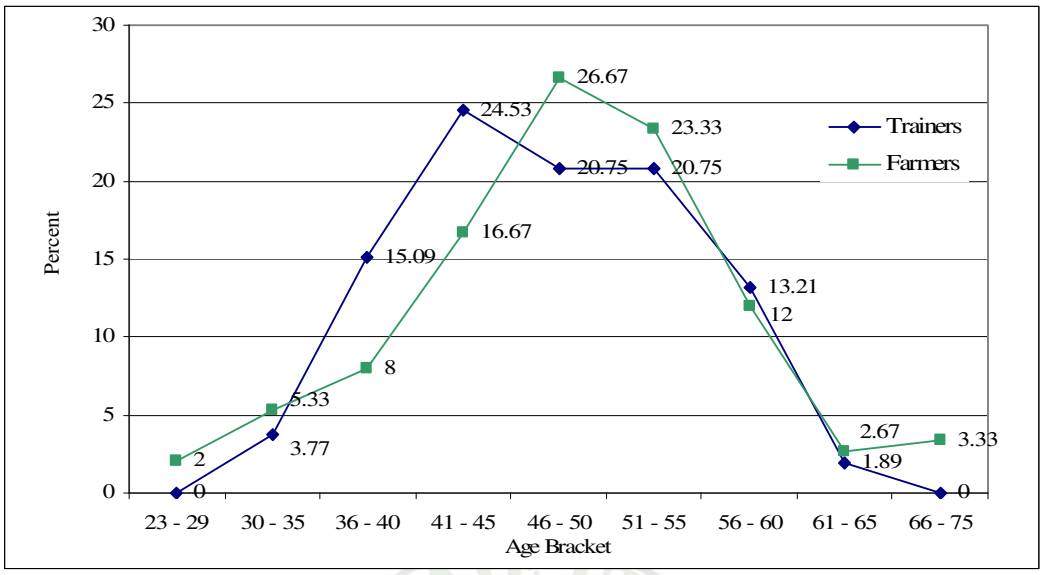


Figure 5. Relationship between the age brackets of trainers and farmer respondents

Educational attainment. Figure 6 shows that 43 or 81% of the trainer respondents finished bachelor's degree while the other 10 or 19% had masters' degree. None among the respondents had doctoral degrees.

All farmer respondents indicated they attended school (Figure 7). Fifty two percent (52%) reached high school; 31% attended college level; and 17% attended elementary education. This shows a high degree of education among the farmer respondents.

Fields of specialization. Table 8 shows nine major groups of specialization of trainer respondents, namely; crop science (agronomy and horticulture), with

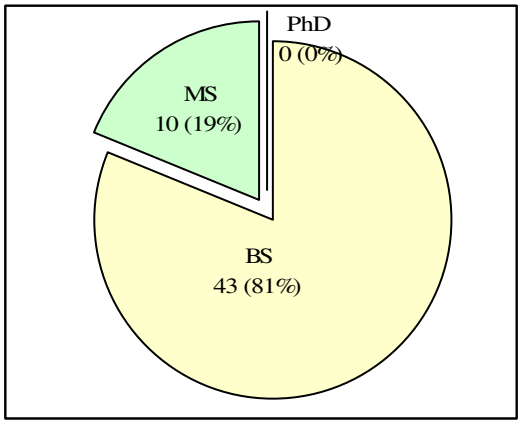


Figure 6. Educational attainment of trainer respondents

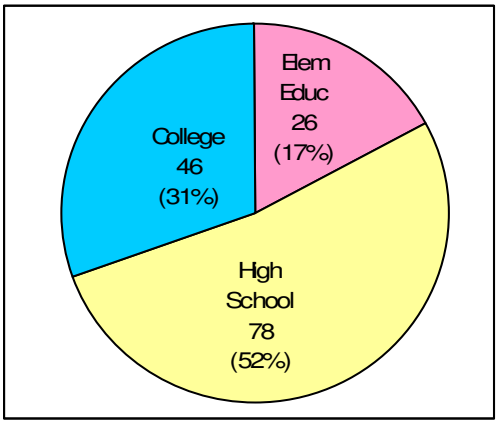


Figure 7. Educational attainment of farmer respondents

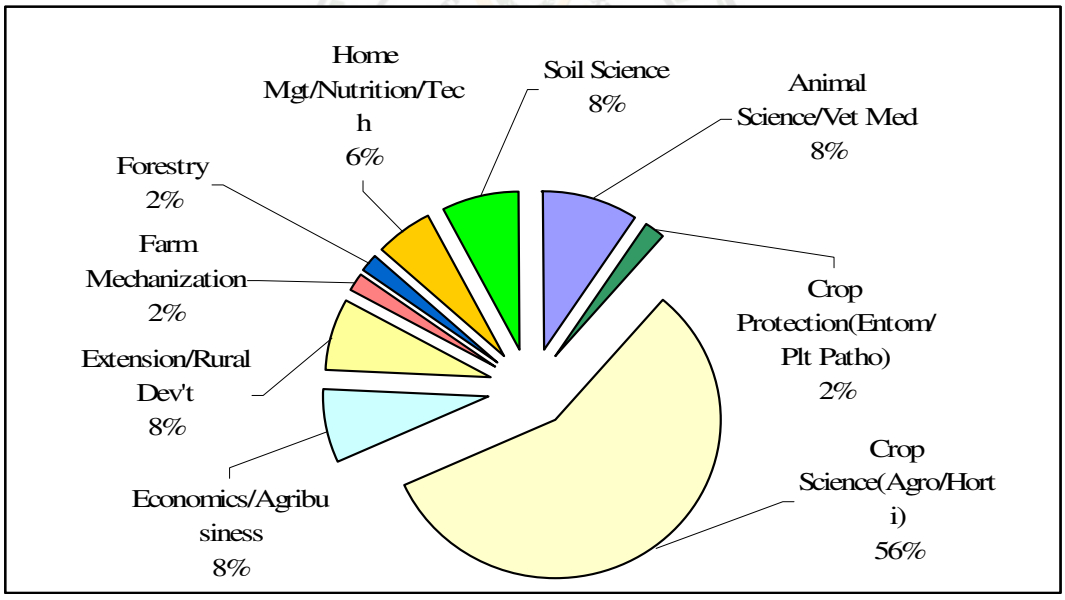


Figure 8. Field of specialization of respondents

56%; economics/agribusiness, extension/rural development, soil science, and animal science/veterinary medicine, with 8% each, home management/home

technology/nutritionist with 6%; and farm mechanization, forestry, and crop protection (entomology and plant pathology) with 2% each. The figure shows a wide diversity of field of specialization working on IPM of various crops using the farmer field school approach.

Positions of trainers in offices. The agriculture technologists comprise the bulk of trainers (65%). The municipal agriculturists (8%) here were former technologists promoted as municipal agriculturist (Figure 9). The higher positions such as senior agriculturist, agriculturist l and ll are positions in the provincial agriculture office. Normally, the provincial staff served as support staff to municipal technicians in the conduct of FFS.

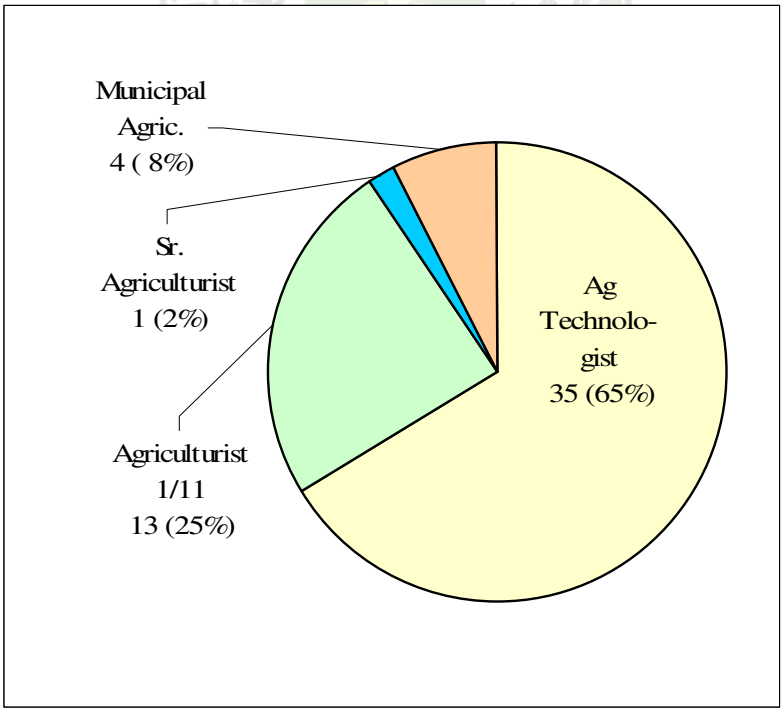


Figure 9. Current position of trainer respondents

Current designations of trainer respondents. Figure 10 shows that all the respondents were designated as coordinators or report officers or focal persons in the different banner programs and projects. Twenty three (46.4%) of the respondents were rice coordinators; followed by high value commercial crops (17%); corn and in rural organizations which include cooperatives, farmers associations, rural improvement clubs and 4-H clubs. Some, they mentioned that due to their designations, their time devoted to FFS has somehow been diluted.

Average savings and earnings from practicing IPM. On the average, the estimated savings of farmers due to their application of the IPM technologies was

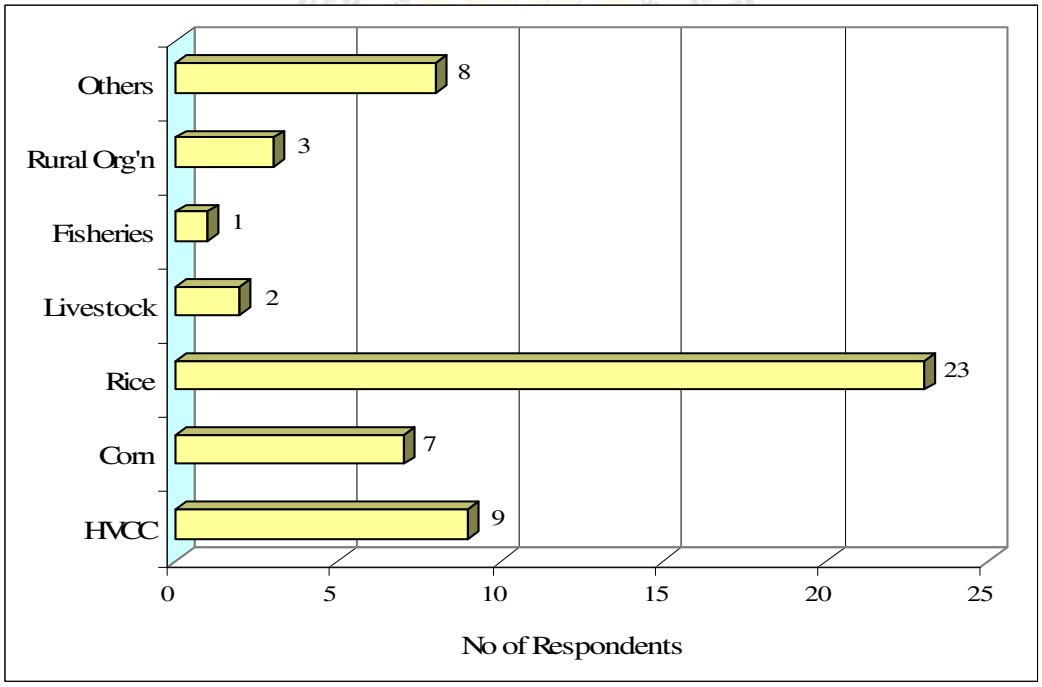


Figure 10. Current designation of trainer respondents

50% from their usual expense on cost of pesticide, fertilizer and labor with 54.97, 51.90 and 43.20% respectively as shown in Table 4. The highest saving was due to the reduction in pesticides use with 44.97%. Farmers also realized an increase of 16.13% in production, 16.61% increase in income and 15.49% increase in profit. The increase in income and profit is attributed to the increase in production and reduced inputs from pesticide and fertilizer. Though this result is not exactly quantified, it surpassed the PhP500 cost saving reported by SEARCA, 1997 (Medina and Callo, 1997). As one group of corn farmers from Kalinga were one in saying during the interview:

> *"Dinmakkel ti apit mi ta nagsukat kami ti barayti ti imula mi metten. Tattan, saan kami nga ag-spray, tractor ti aglinis, e-rotabet mi jay nag-anian min no malpas apit sunga malotlot idiay metlang pagmulaan ket isu ti abono. Idi kadaanan pay ti imulmula mi, ado ti peste, pooranmi mi ti nag-anian mi ken magastoan kami ti aglinis ta mano-mano met. Tattan,, no adda kwarta mi, igatang mi ti organic nga abono".*
>
> ("Our production increased because we changed our local varieties with new ones – referring to hybrid corn. Now, we don't spray, no manual weeding, instead we use tractor to weed and we chop the stubbles using a tractor to be mixed into the soil after harvest to decompose as fertilizers. When we had been using the traditional varieties, there were lots of pests, we spray, do manual labor for weeding, and we burn the stubbles. Now, when we have money, we buy organic fertilizers").

Table 4. Estimated average of savings and earnings of farmers from practicing IPM

BENEFITS	AMOUNT/VOL (%)
1. Cost of pesticide inputs	54.97
2. Cost of fertilizer inputs	51.90
3. Cost of labor	43.20
4 Increase in production	16.19
5. Increase in income	16.68
6. Increase in profit	15.56

FFS Experiences

Commodities respondents were trained. Figure 11 shows the distribution which commodities the respondents were trained. More than half (29) of the trainers were trained in rice (54%); 16 (30.2 %) in vegetables, and eight (15%) in corn. Of the farmer respondents, 66 (44%) were trained in rice; 44 (29.3%) in corn; 35 (23.5%) in vegetables; three in fruits trees; one in cutflower; and one in livestock.

There were no season long training courses conducted for other commodities in the region, thus there were no trainer respondents other than rice, corn and vegetables.

The presence of FFS in other commodities implies that the trainers trained in FFS – IPM of vegetables were able to expand their FFSs to cutflowers, livestock and to fruit production.

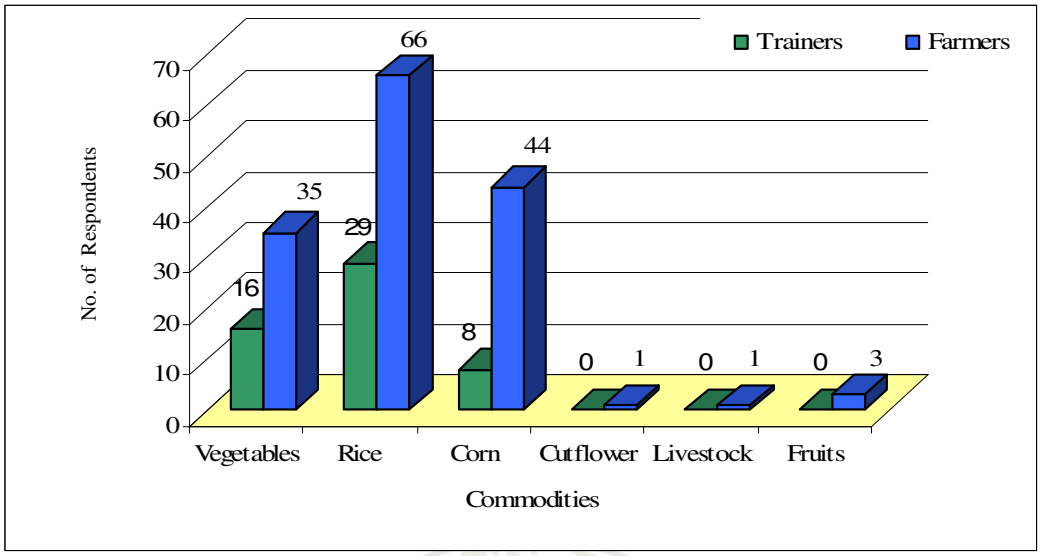


Figure 11. Types of commodity where respondents were trained

Type of IPM – FFS training courses attended by trainers. There were three levels of training courses where trainers were capacitated as trainers of farmer field schools on IPM of vegetable, rice and corn: such as training of specialist; training of trainers; or short courses termed as crash courses. There were 39 who graduated from the training of trainers, 28 of which graduated in FFS - IPM of rice, 6 in vegetable and 5 in corn. A total of 11 graduated in training of specialist, 8 in FFS – IPM of vegetables, 1 in rice and 2 in corn. Only three respondents graduated from a crash course in vegetable and corn (Figure 12).

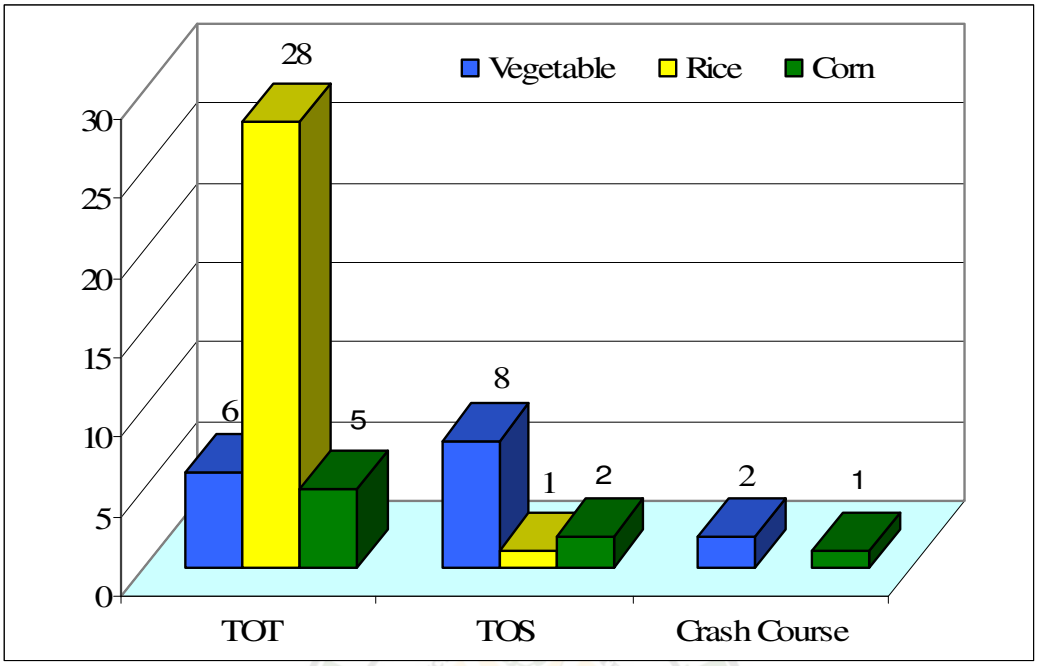


Figure 12. Type of training attended by trainer respondents

Number of years and the number of FFS each trainer conducted. More than 39% or 21 of the respondents conducted FFSs in one to three years since they graduated as trainers. Surprisingly, 37.74% or 20 of the respondents conducted FFS lasting for seven to ten years. Three of the respondents also have reached 13 to 16 years conducting farmer field school (Table 5).

Of the 53 respondents for the number of FFS they conducted, majority of them (39.62%) conducted about six to ten farmer field schools, 32.08% conducted about one to five FFS. Very few of the respondents conducted more than ten farmer field schools (Table 6). It should be noted, however, that the conduct of FFS is a team activity that may have composed of two or three trainers per FFS.

Table 5. Number of years each trainer conducted FFS

NO. OF YEARS (BRACKET)	FREQUENCY (N = 53)	PERCENT
01 – 03	21	39.62
04 – 06	8	15.09
07 – 10	20	37.74
11 – 12	1	1.89
13 – 16	3	5.66

Table 6. Number of FFS conducted by individual trainer

NUMBER OF FFS (BRACKET)	FREQUENCY (N =53)	PERCENT
01 – 05	17	32.08
06 – 10	21	39.62
11 – 15	3	5.66
16 – 20	1	1.89
21 – 25	3	5.66
26 – 30	4	7.55
31 – 35	2	3.77
36 – 40	0	0.00
41 – 45	1	1.89
46 – 50	1	1.89

Number of respondents graduated per year. The total number of respondents who graduated per year is shown in Figure 13. Each year, since the introduction of FFS – IPM in 1993, there had been farmer graduate respondents with the highest number in 1998 with 22 and only one respondent in 1993 and

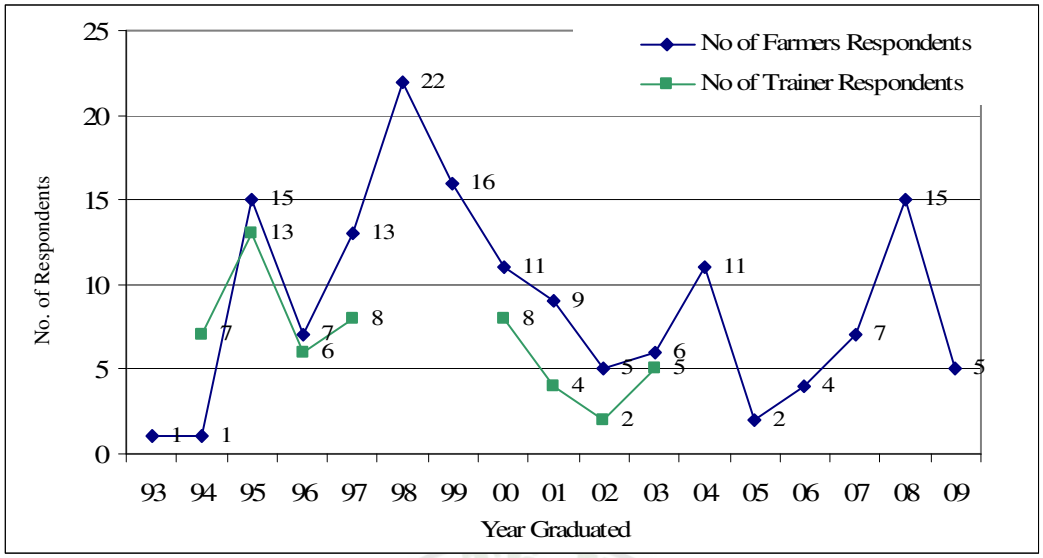


Figure 13. Number of respondents graduated per year

in 1994. There are no trainer respondents between 1998 to 1999 because there were no season long training courses conducted. Instead, the existing trainers were conducting FFSs. The season long training of trainers also stopped in 2003, thus there were no trainer respondents after 2003.

Non season long FFS – IPM training courses attended by trainers. Figures 14 and 15 show the crash course training activities were short term activities attended by trainers of FFS and the number of other related courses attended. These training courses were categorized according to commodities to focus topics. More than 50% of the respondents attended rice FFS – IPM training courses; then corn (24%); and vegetables with 20%. This is so because there are more trained individuals in rice than in corn and vegetables as shown in Figure 12.

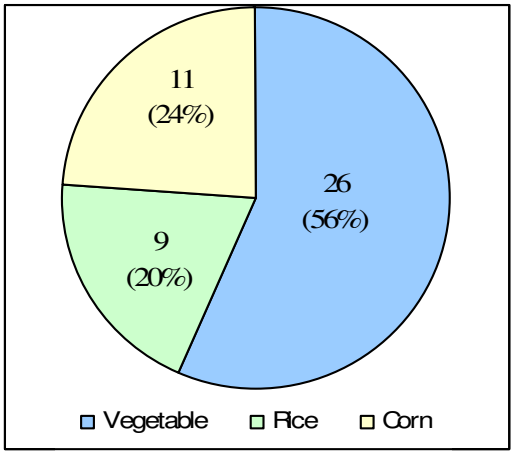


Figure 14. Commodity FFS – IPM crash courses attended

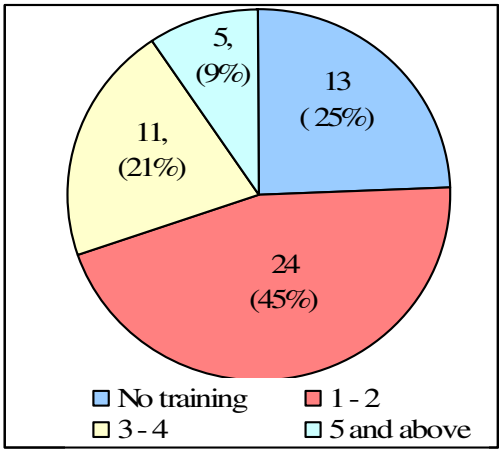


Figure 15. Number of other FFS – IPM related courses attended

Though all respondents attended the crash courses, not all of them had the chance of attending any other FFS related courses. There were 13 (25%) respondents who had no training at all. Forty five percent (45%) attended 1 – 2 trainings while nine percent had five and above training courses.

Cumulative attendance in FFS – IPM related trainings. The cumulative attendance of trainers in FFS – IPM crash courses, other related courses, consultative workshops and involvement as facilitator in FFS – IPM workshops is shown in Figure 16. The trainers of Ifugao and Kalinga had the highest involvements in FFS –IPM related trainings followed by Benguet and Mt. Province. The trainers of Abra and Apayao had lesser participation in FFS – IPM related trainings and workshops. Many of the FFS trained agriculturists from Abra, Apayao and Mt. Province said, that their local executives did not allow

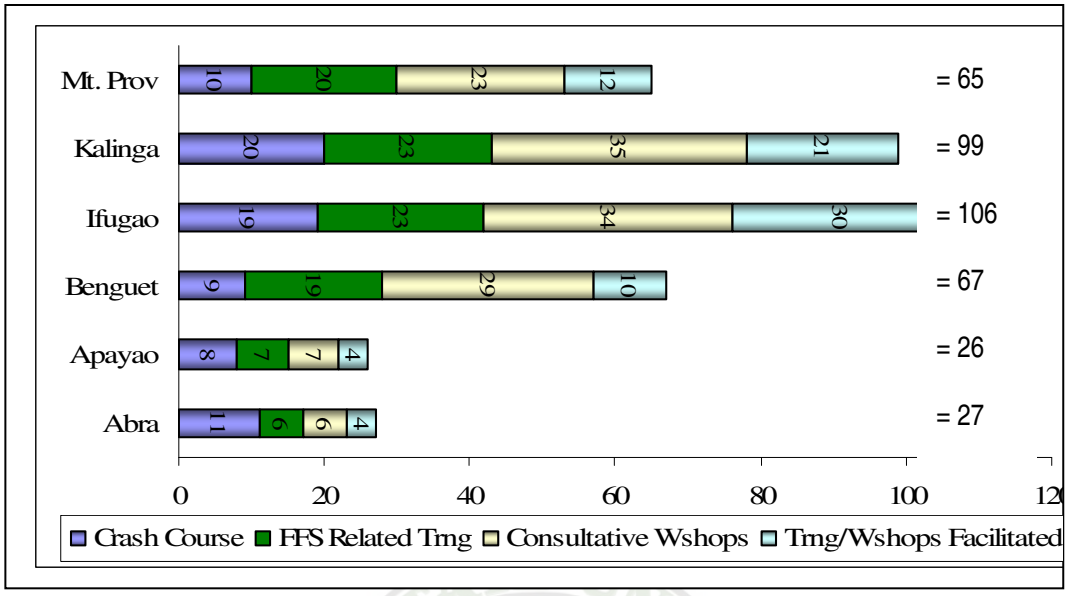


Figure 16. Cumulative attendance in FFS – IPM related training activities

them to attend to the trainings especially when held outside their provinces for the alleged reason that they did not have funds for traveling.

Relationship of Motivations/Goals of Trainers in Implementing Farmer Field Schools

This section presents the relationship of motivations/goals and reasons of the trainers in conducting farmer field school as an approach in training and research in the promotion of Integrated Pest Management in the Cordillera region.

Motivations/Goals of Trainers in Implementing FFS

Table 7 shows the motivations and goals of trainers in implementing IPM through FFS. Significant variations exist among the responses of the trainers. The null hypothesis therefore is rejected. This corroborates what Anon (1995) identified that the FFS - IPM technology promotion is a holistic approach that is equally revolving around economic, health, environment, continuing education and institutional support factors. It holds true in the study as trainers were motivated to implement FFS – IPM in this holistic approach. Efforts had been made to integrate agriculture and human health applying the principles of IPM to people (Pedon, 1998).

The leading motivation/goal of agricultural extension workers in implementing FFS-IPM is for farmers to "produce safer food (81.1%)". This finding follows the "Maslow's Hierarchy of Human Needs" with health or well being as the foundation of need before pursuing to higher level of self fulfillment (Smeltzer and Bare, 2004). This further shows that the demand for "safer food" in the Cordillera Region is currently recognized.

The second motivation for implementing FFS-IPM is to restore and preserve beneficial organisms (77.4%). This is in parallel with the demand for "safer food," and is a requirement for a successful IPM program.

The third motivation is for farmers to reduce use of chemical inputs (75.5%); and the fourth is to enhance biodiversity (62.3%). Both are equally

Table 7. Motivations/goals of trainers in implementing FFS – IPM

MOTIVATION/GOALS	FREQUENCY (N=53)	PERCENT	RANK
Economic Benefits			
Farmers to reduce chemical inputs	40	75.5	3
Higher income and profit of farmers	32	60.4	5
Pesticide free produce commands better price	24	45.3	8
Health Benefits			
Safer food produced by farmers	43	81.1	1
Environmental Benefits			
Restore and preserve beneficial organisms	41	77.4	2
Enhance biodiversity	33	62.3	4
Continuing Education for Farmers			
Regular encounter with farmers in the communities	28	52.8	6.5
Institutional Support			
Presence of strong support from local executives	28	52.8	6.5
Incentives from the program (money, scholarships, trainings, others)	21	39.6	9
Qc = 57.075**		Sig. = 0.000	

important and vital means in the production of safer food. To produce safer food, the farmer has to reduce use of poisonous chemicals, and instead, considers the use of beneficial organisms to hold insect pests and noxious pathogens in check

(Driesche & Bellones, 1996). In preserving beneficial organisms, farmers, are in essence, enhancing biodiversity.

As the need and demand for safer food becomes more important, the seeds of change for the production of safer food were already sown in FFS-IPM and will soon grow. Trainers feel satisfaction and delighted to hear feedback from farmer graduates. One farmer graduate from Mt. Data, Bauko (Batch 1993) recounted:

> *"Ad-ado di naadal sin nan eskwelaan mi sin FFS on IPM. No manpay adi ma-i-apply amin naadal si esa ay panamulaan, ado di nemnemnemen no sino di mayat ay amagen sin sumarsarruno ay panaggargardenan ta maksayan di gasto ya manbomba si pesticide".*
>
> ("We learned a lot of ideas and concepts in crop production during the FFS training and research on IPM. Though we can not apply everything we learned in one cropping period, there are a lot to think of, on what is appropriate to do in the following planting seasons to reduce cost and avoid spraying pesticide").

The trainers further implemented FFS-IPM, not only because it is a mandate but it is strongly supported by some local executives (52.8%). In addition, FFS-IPM provides a venue for regular continuing positive bonding of trainers and farmers in the communities with 52.8%.

Lastly, the provision of incentives whether cash or in kind from the program was the least motivational factor (39%) in implementing FFS.

Reasons of Trainers in Implementing the FFS

The reasons of trainers in implementing the FFS on IPM training and research is shown in Table 8. Significant differences in the responses of the trainers were observed.

The foremost reason of the trainers to implement FFS on IPM is to learn and share knowledge and skills with farmers (84.9%). This illustrates that the methodology of knowledge facilitation and participatory knowledge sharing is still intact among the trainers. This finding conforms with the fundamental principles in participatory training and research (Palengleng, 2008) that "everybody's view counts"; "everyone is different", and "everyone perceives different realities and therefore offers important contributions to a process. The different views and experiences of people can complement each other. Thus, mutual satisfaction is attained during the training.

Ranked as second reason, is to train farmers in IPM through research with 52.8%. This shows that the other core value of FFS, that of experiential learning, is still apparent and the urge to do it is still strong.

The third reason with 30.2% of the trained agricultural extension workers said that they implemented FFS to respond to office mandate. A few (5.7%) cited that they would like to experience and evaluate own capability as FFS trainer. This implies that some trainers are positively challenged to determine their competence as trainers of FFS.

Table 8. Reasons of trainers in implementing the FFS

REASONS	FREQUEN-CY	PERCENT	RANK
1. Respond to office mandate	16	30.2	3
2. Test IPM technologies through FFS	14	26.2	4
3. Train farmers in IPM through research	28	52.8	2
4. Experience and evaluate own capability as FFS trainer	3	5.7	5
5. Learn and share knowledge and skills with farmers	45	84.9	1
Qc = 69.108**		Sig. = 0.000	

Relationships Between Motivational Factors and Extent of FFS – IPM Features and Characteristics' Implementation

Among the five major motivational factors of trainers, higher income and profit of farmers and enhancement of biodiversity had significant relationship with the adaptability, and safer food produced by the farmers with the relevance of the features and characteristics of FFS – IPM (Table 9). The more motivated the trainer to effect higher income and profit of farmers, the lower is their adaptability of the FFS – IPM features and characteristics. This is consistent with the results in Table 13 that the trainers perceived degree of effect of the FFS on the income and profit of farmers and the adoption of IPM are moderate. This finding corroborates the findings of Ali (1997) that the adequacy of the FFS

Table 9. Relationships between motivational factors of and extent of the FFS – IPM features and characteristics implementation

MOTIVATIONAL FACTORS	EXTENT OF THE FFS – IPM FEATURES AND CHARACTERISTICS IMPLEMENTATION		
	Adaptability	Appropria-teness	Relevance
Economic Benefits			
Farmers to reduce chemical inputs	-0.03	0.05	-0.12
Higher income and profit of farmers	-0.33*	0.08	-0.09
Health Benefits			
Safer food produced by farmers	-0.09	-0.06	0.33*
Environmental Benefits			
Restore and preserve beneficial organisms	-0.26	-0.07	-0.08
Enhance biodiversity	0.37**	0.24	-0.26
Continuing Education for Farmers			
Regular encounter with farmers in the communities	0.11	-0.15	-0.23

$r_{.05} = \pm 0.27$ $r_{.01} = \pm 0.35$

** - highly significant

scope/coverage, training time and funds ranged from adequate to fairly adequate. This finding corroborates the findings in Table 18 where five (38%) items of the features and characteristics were modified to be able to address other issues to increase income such as the shift to organic farming as subject matter and increase the duration of training (Table 19) longer interval of sessions. The more motivated the trainer to effect the enhancement of biodiversity, the higher is their

adaptability of the FFS – IPM features and characteristics. The more motivated the trainers to effect the production of safe food by the farmers, the higher they perceived the features and characteristics of FFS – IPM relevant.

In some cases, there were obvious trade-offs between the adaptability of features and characteristics and the weak technical competence or no support from the mother agency or institutions relatively involved in the program, and ensuring the technical quality of FFS. Some FFS trainers repeatedly said:

> "*Saan kayo met gamin nga ag-monitor (referring to the DA-regional office) ta kitan yo ti ar-aramiden mi nga ag-FFS"*.
>
> ("You in the DA, don't come to monitor to see what we are doing in FFS").

The essence of motivation according to Van der Wiele thus applies here. In the adoption of technologies, Van der Wiele (2002) posits that the trainers and farmers may or may not necessarily have technical questions or problems but they merely wanted encouragement through periodic follow up farm visits and mutually agreeable level of technical assistance. The provision of social support ensures the adoption and continuance of agricultural practices and also alleviates the "dependency syndrome".

Moreover, the finding corroborates the statement in Employer-Employee.com. (2001) as cited by Alupias (2002), that the employees' natural motivation relies on the fact that all people have human desires for achievement

and for control and power over their work. In addition they have desires for ownership, recognition and meaning of their work.

Extent of Implementation of the Farmer Field School Features and Characteristics

There were 13 major features and characteristics of FFS that were independently evaluated by the respondents for their adaptability, appropriateness and relevance.

Degree of Adaptability of FFS Features and Characteristics

As shown in Table 10, five features and characteristics of FFS-IPM namely: the methodology; time of the day; subject matter; research theme; and field monitoring had significant differences among the provinces with mean ratings ranging from 2.43 to 2.60 which are highly adaptable.

There is a high adaptability in the methodology, subject matter, research theme and field monitoring were all obtained from Benguet, Ifugao and Kalinga, while moderate adaptabilities were mostly noted from Abra, Apayao and Mt. Province. The reason for higher adaptability can be attributed to the frequency of attendance to training courses. There were more respondents from Benguet, Ifugao and Kalinga who attended more FFS – IPM related trainings such as refresher courses, workshops and conferences than respondents from Abra, Apayao and Mt. Province.

Table 10. Degree of adaptability of the FFS features and characteristics

FEATURES AND CHARACTERISTICS	DEGREE OF ADAPTABILITY						MEAN	DE	F-VALUE	SIG
	Abra	Apayao	Benguet	Ifugao	Kalinga	Mt. Prov				
1. Methodology	2.14	2.33	2.67	2.40	2.83	2.33	2.49	H	2.74**	0.030
2. Duration	2.29	2.17	2.44	2.50	2.83	2.33	2.47	H	1.90^{ns}	0.112
3. Number of participants	2.14	2.33	2.22	2.20	2.75	2.11	2.32	M	1.56^{ns}	0.191
4. Time of day	2.43	2.33	2.33	2.10	2.75	1.89	2.30	M	2.91**	0.023
5. Number of hours	2.29	2.33	2.00	2.40	2.75	2.33	2.38	M	1.64^{ns}	0.168
6. Subject matter	2.28	2.17	3.00	2.60	2.67	2.67	2.60	H	2.70**	0.023
7. Sequence of activities	2.14	2.67	2.11	2.60	2.75	2.56	2.49	H	2.22^{ns}	0.068
8. Research theme: IPM	2.00	2.33	2.56	2.60	2.75	2.11	2.43	H	3.33**	0.012
9. Research design	2.29	2.50	2.44	2.50	2.75	2.44	2.51	H	0.65^{ns}	0.660
10. Field monitoring (AESA)	2.14	2.17	2.67	2.60	2.75	2.78	2.57	H	2.47**	0.046
11. Conduct of insect/ disease zoos	2.00	2.00	2.00	2.00	2.08	1.44	1.92	M	1.26^{ns}	0.298
12. Conduct of field day/ and graduation	2.29	2.33	2.67	2.70	2.67	2.33	2.53	H	0.90^{ns}	0.489
13. Research Analysis	2.14	2.50	2.22	2.50	2.75	2.44	2.45	H	1.64^{ns}	0.168
Mean	2.2	2.32	2.41	2.44	2.7	2.3	2.34	M		
DE	M	M	H	H	H	M				

** - significant ns – not significant

Legend:

1.0 - 1.69 = weak (W)
1.7 - 2.39 = moderate (M)
2.4 - 3.00 = high (H)

The time of day which normally runs from 8:00 in the morning till 12:00 noon was rated moderately adaptable. In IPM, morning is set for FFS sessions because it is this time when majority of the arthropods, some disease symptoms including the vigor of the plants are in their active state, thus the best time to monitor. The provinces of Abra and Kalinga followed the stipulated time of day, though they stated that the time of day was too long. On the other hand, trainers from Apayao, Benguet, Ifugao, and Mt Province found the time too short. In Benguet and Mt. Province, it was found that farmers can stay longer in sessions. Farmers were willing to contribute for lunch than going home hungry after a four-hour session. This can be also attributed to the topography and distance of the place they come from, to the FFS site. The conduct of regular "agro-ecosystem analysis" is rated highly adaptable by majority of the trainers except trainers from Abra and Apayao who rated with moderate adaptability.

The moderate adaptability of the features and characteristics of FFS/IPM in Mt. Province can be attributed to the trainers' experiences in shifting subject matters from one commodity to another. The trainers in Mt. Province implemented FFS in various commodities such as rice, vegetables, fruits, agro-forestry, child nutrition, livestock and organic farming.

Among the provinces of CAR, Abra was the latest to implement FFS, starting their training of trainers in 1999. However, Abra trainers were involved in the Palayaman, a program using the FFS process. Similar with the province of

Apayao, the trainers' experiences with PhilRice conducting the Palayamanan and PalayCheck Models may have influenced their FFS implementation.

Degree of Appropriateness of FFS Features and Characteristics

The degree of appropriateness significantly differed in terms of subject matter and the conduct of agro-ecosystem analysis with 2.60 and 2.47 degrees of appropriateness, respectively (Table 11). The trainers from the provinces of Benguet, Ifugao, Kalinga and Mt. Province found the subject matter and the conduct of AESA highly appropriate while the trainers from the provinces of Abra and Apayao found them as moderately appropriate. Like the adaptability rating, the exposure of the trainers from Abra and Apayao in the Palayamanan and Palay Check program influenced the responses of trainers about these programs running at same time.

Across provinces, majority of the features and characteristics of FFS were highly appropriate except the number of participants, time of day, number of hours and conduct of insect/disease zoo that were rated moderately appropriate.

Results also show that the trainers from the provinces of Benguet, Ifugao, Kalinga and Mt. Province regarded the features and characteristics as highly appropriate. On the other hand, trainers from Abra and Apayao indicated that the features and characteristics of FFS/IPM were moderately appropriate.

Table 11. Degree of appropriateness of the FFS features and characteristics

FEATURES AND CHARACTERISTICS	DEGREE OF APPROPRIATENESS						MEAN	DE	F-VALUE	SIG
	Abra	Apayao	Benguet	Ifugao	Kalinga	Mt. Prov.				
1. Methodology	2.43	2.00	2.78	2.60	2.67	2.67	2.57	HA	2.04^{ns}	0.090
2. Duration	2.57	2.00	2.67	2.60	2.75	2.56	2.57	HA	1.38^{ns}	0.249
3. Number of participants	2.29	2.17	2.44	2.30	2.58	2.11	2.34	MA	0.69^{ns}	0.633
4. Time of day	2.14	2.17	2.33	2.50	2.58	2.33	2.38	MA	0.84^{ns}	0.530
5. Number of hours	2.14	2.17	2.44	2.40	2.58	2.22	2.36	MA	0.89^{ns}	0.494
6. Subject matter	2.29	2.17	3.00	2.60	2.67	2.67	2.60	HA	2.78**	0.028
7. Sequence of activities	2.43	2.17	2.56	2.70	2.67	2.78	2.58	HA	1.11^{ns}	0.370
8. Research theme: IPM	2.43	2.17	2.67	2.40	2.58	2.33	2.45	HA	0.67^{ns}	0.650
9. Research design	2.29	2.33	2.67	2.40	2.50	2.44	2.45	HA	0.38^{ns}	0.858
10. Field monitoring (AESA)	2.14	2.17	2.67	2.60	2.75	2.78	2.57	HA	2.47**	0.046
11. Conduct of insect/ disease zoos	2.14	1.83	2.33	2.20	2.08	1.67	2.06	MA	1.22^{ns}	0.315
12. Conduct of field day/ and graduation	2.29	2.17	2.89	2.70	2.58	2.44	2.55	HA	1.79^{ns}	0.133
13. Research data analysis	2.29	2.17	2.44	2.50	2.58	2.67	2.47	HA	0.77^{ns}	0.574
Mean	2.30	2.13	2.61	2.50	2.58	2.44	2.46	HA		
DE	MA	MA	HA	HA	HA	HA				

** - significant ns – not significant

Legend:

1.0 - 1.69 = not appropriate
1.7 - 2.39 = moderately appropriate
2.4 - 3.00 = highly appropriate

Degree of Relevance of FFS Features
and Characteristics for the Future
FFS Implementation

The degree of relevance of the features and characteristics of FFS - IPM is high. However, differences among trainers in the six provinces are not significant (Table 12). The hypothesis therefore that there is no significant difference in the relevance of the principles, features and characteristics of the FFS – IPM is accepted. This finding implies that whether the ratings are high or moderate, there are no differences between and among the provinces.

The moderate relevant ratings obtained in the number of participants, time of the day, number of hours, and the conduct of insect/disease zoos suggests serious evaluation for efficient and effective FFS program implementation.

Comparing the overall means of provinces, the provinces of Apayao, Benguet, Ifugao and Kalinga showed high relevance of the features and characteristics while Abra and Mt. Province had moderate relevance.

Table 12. Degree of relevance of the FFS features and characteristics for future implementation

FEATURES AND CHARACTERISTICS	DEGREE OF RELEVANCE						MEAN	DE	F-VALUE	SIG
	Abra	Apayao	Benguet	Ifugao	Kalinga	Mt. Prov.				
1. Methodology	2.57	2.50	2.67	2.40	2.75	2.56	2.58	HR	0.46 ns	0.806
2. Duration	2.57	2.33	2.67	2.40	2.75	2.56	2.57	HR	0.65 ns	0.664
3. Number of participants	2.57	2.33	2.33	2.20	2.67	1.89	2.34	MR	1.71 ns	0.150
4. Time of day	2.14	2.33	2.33	2.40	2.67	2.22	2.38	MR	0.92 ns	0.478
5. Number of hours	2.14	2.33	2.11	2.40	2.58	2.22	2.32	MR	0.84 ns	0.531
6. Subject matter/focus topic	2.43	2.33	2.33	2.60	2.67	2.56	2.51	HR	0.69 ns	0.632
7. Sequence of activities	2.57	2.50	2.56	2.70	2.50	2.33	2.53	HR	0.38 ns	0.859
8. Research theme: IPM	2.57	2.33	2.67	2.50	2.42	2.33	2.47	HR	0.56 ns	0.730
9. Research design	2.29	2.67	2.44	2.40	2.47	2.56	2.45	HR	0.39 ns	0.850
10. Field monitoring (AESA)	2.29	2.50	2.56	2.50	2.67	2.75	2.57	HR	0.68 ns	0.642
11. Conduct insect/disease zoos	2.00	2.33	2.22	2.40	2.17	1.67	2.13	MR	1.40 ns	0.242
12. Conduct of field day/ and graduation	2.29	2.50	2.67	2.50	2.83	2.44	2.57	HR	1.41 ns	0.237
13. Research data analysis	2.29	2.50	2.89	2.50	2.67	2.67	2.60	HR	1.23ns	0.311
Mean	2.36	2.42	2.50	2.45	2.60	2.37	2.46	HR		
DE	MR	HR	HR	HR	HR	MR				

** - significant ns – not significant

Legend:

1.0 - 1.69 = not relevant (NR)
1.7 - 2.39 = moderately relevant (MR)
2.4 - 3.00 = highly relevant (HR)

Perceived Degree of Effect of FFS on the
Income and Profit and Adoption of IPM

Table 13 shows the perceived degree of effect of FFS-IPM on the income - profit and adoption of IPM. The overall average shows a moderate degree of effect of FFS from the different provinces of CAR with mean ratings of 2.37 and 2.36, respectively.

It was noted that the degree of effect of FFS on income and profit was strong in the provinces of Ifugao, Kalinga and Mt. Province, while the trainers from the provinces of Abra, Apayao and Benguet perceived the effects of FFS-IPM on the income and profit of their farmers as moderate.

A moderate degree of adoption of IPM was noted significantly different among the provinces. The provinces with high degree of effect of FFS on the income and profit, also had a high degree of IPM adoption. The provinces with moderate degree of effect of the FFS-IPM on income and profit, had moderate degree of IPM adoption. When trainers were asked how many percent of their farmer graduates adopted their learning, majority claimed that about 70% are applied what they learned. The most evident observed technology that farmers adopted was their being more selective in planting materials and varieties. This implies that farmers today consider and continue to seek for quality planting materials and excellent varieties that can give them better income and profit.

Table 13. Perceived degree of effect of the FFS on the income - profit, and application of IPM technologies

PARAMETERS	PERCEIVED DEGREE OF EFFECT OF THE FFS						MEAN	DE	F-VALUE	SIG
	Abra	Apayao	Benguet	Ifugao	Kalinga	Mt. Prov.				
Income and profit	2.14	2.17	2.11	2.50	2.75	2.56	2.37	MS	3.26**	0.013
Adoption of IPM	2.14	2.17	2.11	2.40	2.75	2.56	2.36	MS	3.21**	0.014

** - significant ns – not significant

Legend:
1.0 - 1.69 = weak
1.7 - 2.39 = moderately strong
2.4 - 3.00 = very strong

Relationship Between Socio-Economic Factors of Trainers and Extent of FFS – IPM Features and Characteristics Implementation

This section presents the socio-economic factors of trainers along sex, experiences on FFS and the short courses attended in relation to FFS-IPM features and characteristics implementation with respect to adaptability, appropriateness and relevance.

A significant relationship between the sex and adaptability of the features and characteristics FFS - IPM exists (Table 14). In Table 2, there are 31 females and 22 male respondents. The male respondents had lower perceived adaptability of the features and characteristics of FFS – IPM than females. The hypothesis therefore is rejected. This result disagrees with the findings of Domanog (2007) that gender, civil status and educational attainment do not affect the level of job performance of teachers.

Significant negative relationships exist between the trainers attendance in Season Long Training FFS – IPM training on vegetables and rice and the appropriateness of the features and characteristics of FFS – IPM. The more attendance in season long training FFS – IPM on vegetables and rice, the lesser appropriate are the features and characteristics of the FFS – IPM. The more attendance to season long training in vegetables, the less relevant are the features and characteristics of the FFS – IPM.

Table 14. Relationship between socio-economic factors and extent of FFS – IPM features and characteristics implementation

SOCIO-ECONOMIC FACTORS	EXTENT OF FFS -IPM FEATURES AND CHARACTERISTICS IMPLEMENTATION		
	Adaptability	Appropria-teness	Relevance
Socio-Economic			
Sex	-0.32*	-0.25	-0.08
Age	-0.04	-0.09	-0.11
Educational Attainment	-0.14	-0.11	-0.10
Experiences on FFS			
a. Season Long FFS – IPM Training Attended:			
Vegetable	-0.09	-0.35**	-0.28*
Rice	-0.05	-0.35**	-0.24
Corn	-0.09	-0.21	-0.15
b. Short Courses Attended:			
Crash/Refresher Courses	-0.17	-0.02	-0.05
Other Related Training	-0.01	-0.15	0.19
Related Consultation/ Workshops	-0.21	-0.31*	-0.20

$r_{.05} = \pm 0.27$ $r_{.01} = \pm 0.35$

** - highly significant

There exist significant relationship between the FFS – IPM related consultation workshops attended and the appropriateness of the features and characteristics of FFS – IPM. The more attendance of trainers in consultation workshops, the lesser is the perceived appropriateness of the features and characteristics of FFS – IPM.

Even though, the trainers attended more FFS – IPM season long training on vegetables and rice and related consultation workshops, trainers still perceived that the features and characteristics of FFS - IPM were not appropriate and relevant. These results are opposite of what may normally be expected. It appears that the agriculture technicians may have reached a stage of being bored with more of the same problems to solve, and with the same solutions addressing the complexities of implementing FFS. This includes the appropriate support from the local executives; and the availability of technical information and support needed to address what the farmers need. FFS is attractive where there is always new information, and new lesson to be learned and shared. Many of the trainers claimed that the plans they made after training workshops were not implemented because they did not have enough support from their executives.

The relationship between training and quality management established by Gee and Nystrom thus applies here. Gee and Nystrom (1999) as cited by Cooney *et al.* (2002) found that different levels of training are strategically related to different levels of quality management practices. Limited and one-off training program were associated with quality by inspection whilst comprehensive training was associated with the adoption of full total quality management program. Furthermore, Cooney *et al.* (2002) found that employee training is seemingly more effective, when it is closely combined with comprehensive quality management practices. The close alignment of the training with the development

of skills and competencies that are strategically important to the business seems to enhance the value of the training dollar. The results may indicate that the workshops attended lack quality management or the trainer may also lack quality management in the implementation of FFS – IPM training.

The finding supports the finding of Gumpeng (2008) that younger age, male, and with more number of seminars, trainings or workshops attended perceived higher availability of computer-based technologies.

Reasons of Farmers in Attending the FFS Regular Sessions

The reasons why the farmers attended the FFS/IPM program were determined (Table 15). A significant difference in the responses of farmers on why they attended regular FFS sessions is indicated by the computed Q - value. The primary reason of farmers attending the FFS was due to their expectations to learn new agricultural technologies from the training with 95.3%. This implies that there is a need for knowledge, and for new or advanced technology, to continually improve their lives. The farmers are experienced agriculturists. Nevertheless, they were not contented with doing “more of the same” things.

An indication that the trainers effectively conducted their ground work prior to the conduct of the FFS is the second reason of farmers in attending the program. Majority of the farmers (58.7%) were convinced with the objectives of the training, and that something worthy and valuable will result from the training.

Table 15. Reasons of farmer in attending the FFS regular sessions

REASONS	FREQUEN-CY	PERCENT	RANK
1. Cannot refuse trainers who invited them to join, They know her/him well, and he/she is a friend	13	8.7	7
2. Influenced by neighbors who are attending the training	37	24.7	4.5
3. Persuaded by the presence of friends in the training	21	14.0	6
4. Cannot refuse the local officials/leaders who invited them to attend	10	6.7	8
5. Expected to learn new things from the training	144	96.0	1
6. Expected to get support or material things after the training	68	45.3	3
7. Convinced with the objectives of the training	88	58.7	2
8. An inspiration to others	37	24.7	4.5
Qc = 455.77**	Sig. = 0.000		

In most training activities, especially those conducted by private agricultural companies, “give always” and “give aways” are used to attract farmers to attend. And a good number (45.3%) of farmers who attended the FFS training expected the same. Farmers expected to also get material support such as

T-shirts, caps, samples, etc. after the training program. These are small things, but they somehow show a sense of goodwill and camaraderie with the farmers.

Motivations/Goals of Farmers in Applying the Knowledge and Skills Gained from FFS

To gauge the degree of IPM technology adaptation from FFS, and the motivations farmers have in applying the knowledge and skills they gained from FFS training in their farming activities are presented in Table 16. The table shows that there is a significant difference among the responses of farmers hence, the null hypothesis is rejected. This implies that the motivations of farmers in applying what they learned from the FFS training and research significantly vary from each other.

While the trainers were firstly motivated to train farmers to produce "safer food," the most common motivation of farmers was the possibility for higher income and profit when practicing IPM (83.3%). Trainers can afford to cite "intangible" benefits such as "safe food" because they are consumers of farmers' produce. The farmers, on the other hand, are more practical and prefer economic and tangible benefits that can accrue to them. For farmers, the bottom line is still income and profit.

Table 16. Motivations/goals of farmers in applying the knowledge and skills gained from FFS

MOTIVATIONS/GOALS	FEQUENCY	PERCENT	RANK
1. Reduced pesticide cost and usage	103	68.7	3
2. Reduced fertilizer cost and usage	100	66.7	4
3. Higher income and profit	125	83.3	1
4. Higher yield	98	65.3	5
5. Safer food produced	106	70.7	2
6. Restoration and preservation of beneficial organisms	70	46.7	6.5
7. Cleaner environment	70	46.7	6.5

Qc = 77.624** Sig. = 0.000

This result corroborates the findings of Claveria *et al.* (2009) that the FFS graduates of sweetpotato production in Balutu, Concepcion, Tarlac were motivated to sustain the application of IPM techniques they learned from the FFS training. The application of the learning ensured their high incomes and profits. As a result of the FFS-IPM training, the farmer graduates served as watchdogs to their own group in applying their lessons. This is to avoid the spread of the virus disease which greatly reduces expected yields, income and profit. The FFS graduates were also motivated to form a cooperative to provide Concepcion farmers with clean, virus-free planting materials and to continuously apply what

was learned in the FFS in order to maintain a sustainable source and supply of virus-free sweet potato planting materials. The virus-free cuttings commanded a higher price than the ordinary planting materials.

The second reason why farmers practice lessons learned in IPM is the production of safer food (70.7%). This shows that after income and profit, farmers are also concerned with the quality of their produce, that it be safer to eat. Farmers also have developed social consciousness. Wanawan (2005) found out that organic producers in Benguet were one in saying that they shifted to organic farming not only for reduced cash inputs, better profit, there family's health but also as their social responsibility.

In line with producing safer food, farmers also opted for reduced pesticide cost and usage (68.7%), and for reduced fertilizer cost and usage (66.7%). These identified needs and wants should be part of scaled-up versions of the FFS on IPM in the future. Additional reasons cited by farmers in practicing lessons learned from FFS-IPM were more intangibles such as "higher yield" with 65.3%, and lastly the "restoration and preservation of beneficial organisms", and "cleaner environment" with 46.7%.

The findings are in agreement with what Pontius *et al*. (2002) stated that in Indonesia, some farmers are primarily motivated by the reduced costs and reduced production risk obtained through application of ecological principles to crop management. Some are intellectually stimulated by the subject matter and

excited by the experience of designing and carrying out their own experiments. For others, the main attraction is group interaction, discussions and debates that are important in every FFS. The most striking confirmation of this enthusiasm has been the spontaneous appearance of farmer-to-farmer FFSs, in which field school graduates begin to organize season-long FFSs for other local farmers.

Degree of Application of Knowledge and Skills Gained During the FFS

This section presents the extent of application of knowledge and skills learned during the FFS that focused on: the conduct of regular field monitoring, considering pesticide as the last resort to control pests, the use of proper amount of fertilizers at the right time, practicing crop sanitation at all times, checking for beneficial and harmful organisms in the farm regularly, assessing crop damages regularly, determining income, profit and yield increases, conducting own researches, and maintaining farm recording.

Table 17 shows that almost all the knowledge and skills gained from the FFS-IPM identified in the study differ significantly among the farmers of CAR except on farm recording that is found not significant. Farmers first applied the knowledge and skills they gained from the FFS then later they adopted these to their routine farming activities. The numerical values ranging from 1.93 to 2.01 show a moderate application of the knowledge and skills gained from the FFS – IPM training and research activities.

Table 17. Degree of application of knowledge and skills gained from the FFS

KNOWLEDGE AND SKILLS	DEGREE OF APPLICATION						MEAN	DE	F-VALUE	SIG
	Abra	Apayao	Benguet	Ifugao	Kalinga	Mt. Prov				
1. Conduct regular field monitoring	1.75	2.40	1.87	1.77	2.46	1.55	1.99	M	14.40**	0.000
2. Consider pesticide as the last resort to control pests	1.25	2.05	1.74	1.31	2.57	1.82	1.83	M	27.49**	0.000
3. Use proper amount of fertilizers at the right time	1.62	2.15	1.74	1.65	2.57	1.73	1.99	M	16.49**	0.000
4. Practice crop sanitation all the time	1.62	2.20	1.74	1.62	2.40	1.91	1.94	M	12.70**	0.000
5. Check presence of beneficial organisms regularly	1.96	2.15	1.78	1.65	2.23	1.59	1.91	M	7.11**	0.000
6. Check regularly presence of harmful organisms	2.00	2.20	1.87	1.58	2.31	1.55	1.94	M	10.32**	0.000
7. Assess regularly crop damages	1.87	2.15	1.91	1.88	2.40	1.68	2.01	M	7.56**	0.000
8. Compute income/profit, and yield increases	1.54	2.15	1.70	1.65	2.20	1.68	1.84	M	6.64**	0.001
9. Conduct own researches	1.62	1.90	1.57	1.27	1.91	1.45	1.63	M	4.17^{ns}	0.086
10. Do farm recording	1.79	2.05	1.65	1.62	1.75	1.55	1.72	M	1.97^{**}	0.001
Mean	1.72	2.14	1.73	1.60	2.28	1.65	1.90	M		

** - significant ns – not significant

Legend: 1.0 - 1.69 = weak 1.7 - 2.39 = moderate 2.4 - 3.00 = high

Results also show that Kalinga farmers had high application of their knowledge and skills particularly on the aspects of regular conduct of AESA; considering pesticide as the last resort to pest control; use of the right amount of fertilizer; practice of field sanitation; and regularly assessing crop damages. The rest of the identified learning aspects were moderately adopted. This finding is consistent with the findings in Table 13 where trainers had highly adopted the features and characteristics of FFS.

More than 50% of the learning aspects from the FFS were noted as poorly applied by farmers in Abra, Ifugao and Mt. Province while the other aspects were moderately applied. The farmers from Apayao had a moderate application of their learning from the FFS, except for the conduct of agro-ecosystems analysis which is rated as highly applied. In Benguet, the conduct of research after the training was poorly applied while all the other items were moderately applied.

The knowledge and skills gained from the FFS-IPM, particularly in the Agro-ecosystem analysis provided farmers with a more systematic manner of monitoring their fields regularly. Their regular assessment and interpretation of the observations has apparently become a habit. Farmer graduates now do regular assessment of crop damages; regular field monitoring; and are more conscious with the proper use of pesticides and the amount of fertilizers, applied at the right time. One farmer said during the interview:

> *"Tatta a ket, nadaras ti panagpasyar met idiay talon ta kitaen no anya ti problema. No idi a ket, no nalpas to raep ket mapan lang no tiempo ti panag-spray ken panag-abono".*
>
> ("Now, I visit the field very often to see the problems. Before, after planting is finished, i only go to the field when i spray and apply fertilizer").

This result is in support to the statement of Van den Berg (2004) that FFS graduates gained complex knowledge on agro-ecosystem management, retained over five years and knowledge was shared with non-FFS, however it did not readily diffuse.

Although considered mundane farm activities, the practice of crop sanitation at all times to reduce insect pest incidence and disease inocula, is now better appreciated. With this practice, a similar activity is to regularly check the presence of harmful organisms in the farm. This monitoring led to the reduction of pesticide use to 54.97% (Table 6).

Overall, the level of application of knowledge and skills learned is moderate. This result indicates that the farmers have yet to reach a level of adjustments in the application of IPM technologies.

Other constraints in the low adoption of IPM identified by Ali (1997) are the lack of full and continuous support from the local government units, lack of awareness and appreciation of IPM products, lack of specific market outlet for IPM products, and insufficient training. Tovignan and Nuppenau (2004) found that the reasons for non adopters are low yields, and lack of information while

adopters reasons are based on desire for stable income, lack of transparency in the conventional sector and health. Domoguen (2008), pointed that aside from strengthening the implementation of FFS, the local market should put a premium on products that are healthier to eat to encourage the sustenance of farmers to practice IPM and better yet, to convert to organic farming.

Degree of Changes Made and Suggestions in the FFS - IPM Features and Characteristics

This section focused on the changes made on the 13 major features and characteristics of FFS namely: methodology; duration; number of participants; time of day; number of hours; subject matter; sequence of activities; research theme; research design; field monitoring; conduct of insect/disease zoos; conduct of field days and graduation; and determining incomes and profits. It also considered the suggestions/modifications with regards to features and characteristics of FFS-IPM.

Degree of Changes Made in the FFS-IPM Features and Characteristics

Significant differences among the provinces were observed in the time of day, number of hours, subject matter or topic, research design, conduct of AESA, and conduct of field day and graduation (Table 18). It was noted that five items of

Table 18. Degree of changes made in the FFS features and characteristics

FEATURES AND CHARACTERISTICS	DEGREE OF CHANGES MADE						MEAN	DE	F-VALUE	SIG
	Abra	Apayao	Benguet	Ifugao	Kalinga	Mt. Prov.				
1. Methodology	1.57	1.50	1.44	1.40	1.08	1.33	1.39	NC	1.26	0.299
2. Duration	1.29	1.33	1.44	1.50	1.08	1.67	1.39	NC	1.86	0.121
3. Number of participants	1.43	1.33	1.44	1.30	1.25	1.67	1.40	NC	0.86	0.517
4. Time of day	1.29	1.17	1.78	1.40	1.33	1.78	1.46	NC	2.77*	0.028
5. Number of hours	1.29	1.17	1.78	1.80	1.33	1.89	1.54	M	3.34*	0.012
6. Subject matter/focus topic	1.29	1.33	1.56	1.50	1.17	1.89	1.46	M	3.46*	0.010
7. Sequence of activities	1.29	1.17	1.44	1.70	1.25	1.67	1.42	NC	1.10	0.373
8. Research theme: IPM	1.43	1.33	1.89	1.70	1.42	1.78	1.59	M	1.74	0.144
9. Research design	1.57	1.17	1.67	1.70	1.25	1.78	1.52	M	2.48*	0.045
10. Field monitoring (AESA)	1.43	1.17	1.44	1.60	1.00	1.44	1.35	NC	2.50*	0.044
11. Conduct insect/disease zoos	1.71	1.17	1.67	1.60	1.58	1.67	1.57	M	0.84	0.494
12. Conduct of field day/ and graduation	1.43	1.43	1.56	1.20	1.00	1.33	1.33	NC	2.84*	0.026
13. Research data analysis	1.14	1.14	1.00	1.10	1.00	1.22	1.10	NC	1.09	0.376
Mean	1.40	1.26	1.55	1.50	1.21	1.62	1.42			
DE	NC	NC	M	M	NC	M	NC			

** - significant ns – not significant

Legend: 1:00 – 1.49 = No change (NC)
1.50 – 2.00 = Modified (M)

the features and characteristics namely: number of hours; subject matter or topic; research theme; research design; and conduct insect/disease zoos were modified which were done in Benguet, Ifugao, and Mt. Province.

The modifications made were necessary to address all necessary topics covered under each particular commodity or topic. These were attributed to the shifting of FFS from IPM of vegetable to organic farming; to fruits trees; to agro-forestry; to livestock; to child nutrition; to rice or corn; and from rice to vegetables; to corn or other commodities. All these required flexibilities to address specific commodities.

The conduct of insect/disease zoo, though not significant is modified by all the provinces. This implies that the conduct of insect/disease zoos is somehow difficult to handle by farmers. Few indicated they omitted this part during the conduct of FFS. Insect/disease zoos require some degree of delicate handling, and need appropriate materials to be successful. The preparation of materials and the conduct of insect/disease zoo are painstaking and meticulous.

Suggested Modifications in the FFS-IPM
Features and Characteristics

There are relatively few responses on the suggested modifications with regard to the features and characteristics of FFS (Table 19). However, their suggestions were considered important for any improvement of the program.

Table19. Issues and suggested modifications in the FFS features and characteristics

ISSUES AND SUGGESTED MODIFICATIONS IN THE FFS FEATURES AND CHARACTERISTICS	FREQUEN-CY	PERCENT
1. Methodology - Discussion too long that this may cause annoyance resulting to dwindling attendance - Strengthen the participatory part of FFS. Participants should be more involved in the planning process and actual conduct of the study - Adopt Palaycheck system - Consider the use of charts, film showing	10	18.5
2. Duration - For vegetables, at least 3 cropping, every after two weeks sessions - For organic based FFS for 2 – 3 cropping season, twice meetings in a month - Farmers classes for straight 5 days	9	16.7
3. Number of participants - Reduced participants 15-25 (only interested)	5	9.3
4. Time of day - Consider scheduling on weekend to accommodate more farmers	2	3.7
5. Number of hours - Reduced number of hours to 2 -3 hours - Lengthen time if necessary	6	11.1

Table19. continued…

ISSUES AND SUGGESTED MODIFICATIONS IN THE FFS FEATURES AND CHARACTERISTICS	FREQUEN-CY	PERCENT
6. Subject matter/focus topic - Emphasize more on profit and income - In strawberry, cycles of planting material production- the critical production factor should be emphasized - Include marketing - Expand to ICM - More on soil fertility, nutrient management - Note: In fertilizer computation: it's the job of the technician, not many farmers are able to do it even with STK results - Insect, pest and diseases - Skills development in monitoring leads to better mgt techniques - Emphasize on use of cultural practices: planting distance, use of biological control agents available - Organic farming	10	18.5
7. Sequence of activities	1	1.9
8. Research theme	2	3.7
9. Research design - Include variety trials , INM trials - Improve skill in data collection and analysis	8	14.8
10. Field monitoring (AESA) - Drawing every time is not necessary, farmers already know the pests. Instead concentrate on its management, and emphasize on knowing the signs and proper timing of management and importance of monitoring, early		

Table19. continued…

ISSUES AND SUGGESTED MODIFICATIONS IN THE FFS FEATURES AND CHARACTERISTICS	FREQUEN-CY	PERCENT
detection of possible problems will lead to IPM. - Drawing may discourage those who are not skilled and loose interest in participating - Do question and answer in the field rather than drawing and presentation of groups drawings - Optional AESA – reporting of observations and remove drawing but more of insect/disease identification	6	11.11
11. Conduct of insect/disease zoos - Minimize or reduce insect/disease zoos - b. Omit the insect/disease zoo	8	14.8
12. Conduct of field day/and graduation	3	5.6
13. Calculation of incomes and profits	5	9.3
Qc = 27.165** Sig. = 0.000		

Statistical analysis shows that the varied responses are significantly different from each other as shown in Cochran's Q-test at 27.165.

The highest percentage of proposed modifications is in the methodology and the subject matter of the training with 10 (18.5%) respondents each. The identified methodology suggested improving the facilitating skills of trainers to be able to sustain interest during sessions and thus sustaining high attendance.

PalayCheck system was suggested as an upscaling FFS activity for rice systems, including the use of charts and film showing.

On the subject matter, majority of the topics are of the same subjects in the previous curriculum. Additional topics included marketing which emphasized income and profit; and organic farming. An important concern raised is the transfer of some skills that may not be necessary for farmers, such as the use of a Soil Test Kit (STK). It was mentioned that majority of the farmers may not be able to use this tool in their lives. Thus, this level of technology may be more appropriate for technicians, while the farmers are the end users of results of the STK analysis made by the technicians.

The third area with highest respondents (9) is the duration of the FFS training. The suggestions vary. Some hope to reach their goal of proving the outcome of IPM and organic farming; some suggest three cropping seasons, but with longer interval of sessions like every after two weeks, and having FFS for straight five days.

As regards research design, which is normally comparative studies between IPM practices versus the conventional farmers' crop protection practices, eight(8) respondents suggested more researches in integrated nutrient management and also variety trials. There had been arguments about making the research simple with the farmers. However, simplicity at the farmers' level is combining all available management practices aimed to increase yield. At the end

of the training-research, it was noted that many factors might have affected the results. More often, fertilizer trials were combined with many other techniques in pest management, hence, it would be more appropriate to call it integrated crop management.

Another proposal from eight(8) respondents (14.8%) was to omit or reduce the conduct of insect-disease zoos to conform to the poor adaptability results (Table 8), and thus, was modified and omitted during the FFS implementation (Table 15). This implies that the trainers have difficulties in dealing with the science of IPM not due to the lack of appreciation and understanding. On the other hand, it must be required, although in a more systematic manner. Insect and disease zoos are important tools to show and illustrate "cause and effect" of pests, and even of beneficial organisms. Trainer and farmer "friendly" insect and disease zoos should be devised for all the crops to encourage the use of the approach.

In field monitoring, using the Agro-ecosystem analysis, it was suggested that emphasis should be the skill to identify or detect early signs and symptoms of crop production problems. This will help the farmers practice IPM. Trainers felt that the drawing in AESA may not be necessary anymore. Instead, they proposed that "question and answer" be conducted in the field while actively going through their observations. The agro-ecosystem analysis is the centerpiece of the FFS in

which decision making evolves. Without observations in the field, there is no base information for discussions.

Other proposals were to reduce the number of participants per FFS from 25-30 to 15 – 20, and to select those that are truly interested and the possibility of reducing the number of hours to two to three hours per session.

Suggested Topics for Future FFS

On topics for consideration in case the FFS will be conducted again, the following were suggested: Integrated Pest Management, Integrated Soil Fertility Management, Organic Farming, Food Processing, Marketing, Good Agricultural Practices, and Farm Enterprise.

Statistical analysis shows in Table 20 that there is significant difference among responses at 74.275. Organic farming was chosen as the most preferred topic (66.7%) followed by Integrated Soil Fertility Management (58.7%) and Integrated Pest Management (52%). The results indicate that the farmers realized they needed the know how to improve soil fertility. Some farmers related during the interview that no matter how they managed pest problems if the soil is poor, they can not achieve proper pest management especially for diseases. The crop yield still suffers, thus the need for options to improve soil fertility.

This observation is in fact the foundation of organic farming. Organic farming relies primarily on proper crop nutrition. This is the commonly observed phenomenon whereby a plant that is provided with the proper nutrition from

Table 20. Suggested topics in the future FFS

TOPIC	FREQUENCY	PERCENT
1. Integrated Pest Management	78	52
2. Integrated Soil Fertility Management	88	58.7
3. Organic Farming	100	66.7
4. Food Processing	35	23.3
5. Marketing	61	40.7
6. Good Agricultural Practices	59	39.3
7. Farm Enterprise	67	44.7
Qc = 74.275*	Sig. - 0.000	

natural sources, will be healthy and highly productive even without the use of synthetic pesticides and fertilizers. A naturally healthy plant can better withstand and counter the effects of insect pests and diseases. As the Soil Association believes that "organic farming is the only way that high quality food production can go hand in hand with caring for our health, the countryside, and its wildlife" (http://www.sheepdrove.com/203.htm).

The least topic chosen by the respondents was food processing (23.3%). This implies that generally farmers do not go for processing their produce instead they produce for the processing institutions.

Summary

The purpose of the study was to gather information on the implementation of Farmer Field School and the adoption of the IPM technologies. Specifically, the study determined: 1) the relationship between motivational factors and the extent of the adaptability, appropriateness, and relevance on the features and characteristics of FFS-IPM and reasons in the conduct of FFS-IPM; 2) the extent of the adaptability, appropriateness, and relevance on the features and characteristics of FFS-IPM; 3) the relationship between the socio-economic factors and the extent of the adaptability, appropriateness, and relevance of the features and characteristics of FFS-IPM; 4) the degree of application of IPM technologies; and 5) identified suggestions for the improvement of the FFS program.

Fifty three active trainers and 150 farmer graduates were interviewed in 22 selected municipalities in all the provinces of CAR, namely: Abra, Apayao, Benguet, Ifugao, Kalinga , and Mt. Province.

The study used a semi-structured survey questionnaire to collect data. The data base on FFS implementation from the Regional IPM Coordinating unit of DA – RFU, CAR served as source of data for the identification of respondents. Focused group discussions and triangulation was employed. The data were statistically analyzed using frequency, mean, percentages, analysis of variance,

Cochran Q-test with the SPSS program and point biserial for correlations. Comparisons were made at 0.05 level of significance.

The following are the salient findings of the study:

1.a) Most of the trainer respondents were in the middle ages (41 – 55); more females than male; 81% college graduates and 19 with masters degree in nine different disciplines; 74% graduated from TOT, 21% from TOS, and 6% from crush courses in vegetables, rice and corn; implemented an average of seven FFS in an average of three years; 45% attended five or more FFS-IPM related training courses and workshops, 30% attended less than 5 but 25% never attended other FFS related training courses.

1.b) Majority of the farmers were in the ages 41 - 55, 31% reached college, 52%finished high school, and 17 in high school; had average savings of 54.97% from cost of pesticide, 51.90% from fertilizer inputs, 43.20% from cost of labor; 16.19% increase in production, 16.68% in income, and 15.56% in profit.

2. a) The lead motivation for trainers in implementing FFS-IPM was their concern for health (production of safe food), followed by the efforts to restore and preserve beneficial organisms, reduce chemical inputs, enhance biodiversity, and increase income and profit of farmers. In addition, trainers were motivated because they have opportunities for regular encounters with farmers in the barangays with support from their heads of offices.

2.b) Reasons for implementing the FFS were to learn and share their knowledge and skills with farmers, and train farmers in IPM by research. Some trainers implemented FFS to respond to office mandate and few admittedly are challenged to test their ability as trainers of IPM.

2.c) Three motivational factors significantly influenced the adaptability, appropriateness and relevance of the features and characteristics of FFS – IPM namely: higher income and profit of farmers, safer food production, and the enhancement of biodiversity. The more motivated the trainer to effect higher income and profit by the farmers, the lesser was their adaptability of the FFS – IPM features and characteristics; the more motivated the trainer to effect the enhancement of biodiversity, the higher was their adaptability; and the more motivated the trainers to effect the production of safe food by the farmers, the higher the perceived relevance are the features and characteristics of FFS – IPM.

3.a) The overall degree of adaptability of the features and characteristics was moderate; the degree of appropriateness and relevance were both high.

3.b) Number of participants, time of the day, number of hours, and the conduct of insect/disease zoos were consistently rated moderate along adaptability, appropriateness and relevance.

3.c) High degree of adaptability was noted from the trainers of Benguet, Ifugao and Kalinga, moderate from Abra, Apayao and Mt. Province. High level of appropriateness was found from trainers in Benguet, Ifugao, Kalinga and Mt.

Province; moderate from Abra and Apayao; and high degree of relevance from Apayao, Benguet, Ifugao, Kalinga and moderate from Abra and Mt. Province.

3.d) The effects of FFS on the income and profit as well as the adoption of IPM technologies were moderate.

4.a) Gender, season long training in FFS – IPM on vegetables and rice and attendance to FFS –IPM related consultation workshops had negative significant relationships with the adaptability, appropriateness and relevance of the features and characteristics of FFS – IPM. The male respondents perceived a lower adaptability of the features and characteristics of FFS – IPM than the females. More attendance in season long training in FFS – IPM on vegetables and rice, the lesser appropriate are the features and characteristics of the FFS – IPM. More attendance in season long training in vegetables, relevance was less perceived; More attendance of trainers in consultation workshops, the lesser was appropriateness perceived.

4.b) Farmers attended regular FFS sessions basically 1) to learn new things as they were convinced with the objectives of the program; and 2) farmers expected to get support or material things after the training. Other reasons included the influence of neighbors attending the training and they became inspiration to others.

4.c) Major motivation in applying knowledge and skills gained were higher income and profit, safer food, reduced cost of pesticides and reduced cost of fertilizers.

4.d) Degree of knowledge and skills applied was moderate. Provinces differ significantly with Abra, Apayao, Benguet, and Kalinga had moderate level of application of the knowledge and skills while weak application of knowledge and skills was noted in Ifugao and Mt. Province.

5.a) Significant differences existed among the provinces in the degree of change along time of day, number of hours, subject matter, research design, and conduct of insect/disease zoo. Number of hours, subject matter, research theme, and field monitoring were modified.

5.b) Suggestions for modifications were on methodology, coverage of subject matter, duration, conduct of insect/disease zoo, research design, conduct of AESA and the number of hours. Topics suggested for any upcoming FFS related training activities were organic farming, soil fertility management, and integrated pest management.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the results and findings, the following conclusions and implications are drawn:

1. Middle age may be considered as a right age for trainers to conduct FFS, workshops which is coupled with high educational qualifications. On the other hand, training qualifications vary in terms of the number of trainings taken, number of crash courses attended to no training at all related to FFS-IPM. Most farmer respondents are middle aged and are economically capable to apply IPM program.

2.a) The trainers' motivation for the implementation of the program is based on the fundamental tenets of self-preservation and concern for the environment hence the trainers' main reason to conduct FFS is to share knowledge and skills to the farmers.

2.b) There are motivational factors that influence adaptability, appropriateness and relevance of the features and characteristics of FFS-IPM; others do not.

3. The degree of adaptability, appropriateness, and relevance of the features and characteristics in the implementation of the program ranges from moderate to high.

4. Socio-economic factors as used in the study reflect the trainers' need for more relevant, appropriate and adaptable aspects of the program to address the needs of the changing times. The farmers' level of application of knowledge and skills gained from FFS – IPM varies from moderate to low.

5. While there are no changes made in the features and characteristics of FFS – IPM, suggestions for modifications emphasizes aspects where trainers consider as important.

Recommendations

Based on the findings and conclusions, the following are recommended:

1. There is a need for new a breed of younger FFS as core trainers. The training programs should be selective to consider age, field of specialization that is close to the main training content and those who have potential skill and competencies for development.

2. The motivating factors of trainers in implementing the FFS –IPM program does not only benefit trainers and farmer graduates but for the entire consuming public. It is therefore recommended that the FFS be placed in a broader rural development perspective because benefits also accrue to sectors such as the public health, environmental protection, economy and education. Resources from the above sectors can be pooled to support safe food production by the local farmers not only in terms of manpower resources but funding. DA

should revive and spearhead or establish a strong coordinating body among agencies concerned to corner funds from agencies, not only from DA and LGUs to support safe food production.

3. Though the program supposes to be LGU led, the DA is still seen as the initiator of the program including full fund source. Thus, DA should institute a strong monitoring and evaluation scheme not only counting the number of FFS conducted and number of farmers trained but the impact of the FFS – IPM through the local executives. The DA should look at the FFS as a developmental program, not as stand alone, thus DA should prioritize graduates of FFS as partners in their various programs and projects, and as implementers of the agriculture interventions initiated from the agriculture sector. This way, confusions by the agriculture technicians and the farmers about programs and projects implemented by the DA is corrected.

4. All the features and characteristics contribute to the uniqueness, dynamism, and strategic effectiveness of FFS-IPM to efficiently promote the adoption of technologies. Five items namely, duration, number of participants, time of day, number of hours, and conduct of insect/disease zoos have to be re-examined to conform with norms that make a quality training program cost effective and efficiency. The cause of the differences between moderate and high degree of implementation among the provinces should also be re-examined and evaluated for future recommendations. Follow-up workshops are needed to

evaluate the adaptability, relevance and appropriateness of insect/disease zoos and other items in the features and characteristics of FFS to be able to identify the weaknesses and strengths affecting the efficiency of FFS/IPM implementation. The DA (or any institution conducting related training) should be conscientious in accepting training, workshop participants. Training should only be undertaken where it is strategically important to do so and where the training effort can have maximum effect.

5. To sustain the attendance of farmers in regular sessions, clarity on the objectives and goals of the program is very important to be understood during the ground working activities. Trainers must always have new relevant information every session to sustain and drum beat the participation and interest of farmers.

6. It is recommended that an exit plan should be developed with graduates is recommended. In similar manner, the LGUs should develop long term follow up mechanism to keep tract agricultural production management practices and activities of farmers. Farmer participants can now pay acceptable training cost for better appreciation of learning.

7. The specific suggestions and comments concerning the implementation of FFS-IPM with regards the features and characteristics be evaluated further for their usefulness in the program.

LITERATURE CITED

ALI, I. D., 1997. The Effectiveness of Farmers' Field School as a Training Strategy for Sustainable Adoption of Integrated Pest Management by Cordillera Vegetable Farmers. Unpublished Doctoral Dissertation, Benguet State University, La Trinidad, Benguet.

ANON. The Principles of Organic Farming. http://www.sheepdrove.com/203.htm. Accessed on August 26, 2009.

ANON, 1994. KASAKALIKASAN, The Philippine National IPM Program. Printed by the National Agribusiness Corporation.

ANON. 2009. Leadership Theories on Motivation and Satisfaction. http://www.essay-911.com/samples/Theories.htm. Accessed on August 26, 2009.

ATI-DA, CAR, 2008. Agricultural Workers Profile of the Cordillera Administrative Region.

ARCHER, D., 1997. The REFLECT Process at an International Level. Participation, Literacy and Empowerment. PLA Notes. IIED. Vol. 32. Pp. 31- 39.

BINAMIRA, J., 2001. Country Report submitted at the meeting of the Programme Advisory Committee, November 2001. Community Integrated Pest Management.

BROTO, A. S., 2008. Statistics Made Simple. Second Edition. National Book Store. P. 12.

CHENG, C. L. and K.V. BERSAMIRA, 1997. Pesticides: Its Hazardous Effects on the Benguet Farmers and the Environment. Unique Printing Press, Baguio City. Philippines. P.5.

CLAVERIA, C., L. PALENGLENG, and A. PEREY, 2009. Technology Assessment of Sweetpotato Clean Planting Material Production in Balutu, Conception, Tarlac. Research Paper in Technology Assessment Class 2008. Unpublished

COONEY, R., M. TERZIOVSKI and D. SAMSON., 2002. Employee Training, Quality Management and the Performance of Australian and New Zealand Manufacturers. Working Paper. Monash University. New Zealand.

COTTINGHAM, S., 1998. How can REFLECT be used widely without diluting the Participatory Nature of the Process. Participation, Literacy and Empowerment. PLA Notes. IIED. Vol. 32. Pp. 43-46.

DA-RFU, CAR, 2008. Status Report. KASAKALIKASAN, The Regional IPM Program.

DOMANOG, L. E., 2007. Job Satisfaction and Work Value of Teachers in the Vicariate Schools of Mt. Province. Unpublished Master'sThesis, Benguet State University, La Trinidad, Benguet.

DOMOGUEN, R. L., 2008. Strengthening the Farmer Field School. Agriculture Magazine. Feb. 2008.

DRIESCHE, R. V. & T. S. BELLONES, 1996. Biological Control. New York. An International Thompson Publishing Company. Pp. 76 – 81.

Employer-Employee.com (2001), as cited by Alupias, E. 2002. Capacity Development of the Researchers of Benguet State University. Unpublished Doctoral Dissertation, Benguet State University, La Trinidad, Benguet.

GALLAGHER, K. D., A. R. BRAUN and D. DUVESKOG. 2009. Demystifying Farmer Field School Concepts. Accessed on July 11, 2009. Unpublished.

GEE and NYSTROM (1999) as cited by Cooney, R., M. Terziovski & D. Samson (2002). Employee Training, Quality Management and the Performance of Australian and New Zealand Manufacturers. Working Paper. Monash University. New Zealand.

Global FFSNet. 2008.

GUMPENG, J. T., 2007. Computer-Based Technologies and the Science Teachersin the Catholic Elementary Schools in Baguio City. Unpublished Master's Thesis, Benguet State University, La Trinidad, Benguet.

IIBC, 1996. TA Final Report. Integrated Pest Management for Highland Vegetables. Volume 1.

IIBC, 1996. Farmer Field School Documentary. Integrated Pest Management for Highland Vegetables. Volume 6.

LEGASPI, A. G., 1995. Adoption of Rice Production Technologies in Pangasinan: An Assessment. Unpublished Doctoral Dissertation, Benguet State University, La Trinidad, Benguet.

MEDINA, J. R. and CALLO, J. P. Jr., 1997. Empowering Farmers: The Philippine National Integrated Pest Management Program. SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA), Los Banos, Laguna. Philippines.

PALENGLENG, L. M., 2008. Final Report. Farmer Field School. Rural Enterprise and Small Scale Commercial Agriculture Development Project. The World Bank and Ministry of Agriculture, Armenia.

PALENGLENG, L. M., 2008. Farmer Field School Training Manual for Armenia. Unpublished.

PEDON, D. G., 1998. Agroecosystem Management for Improved Human Health: Applying Principles of Integrated Pest Management to People. Proceedings of the Annual Meeting of the Canadian Society of Animal Science. Canada.

PONTIUS, J, R. DILTS, and A. BARTLETT, 2002. Ten Years of IPM Training in Asia - From Farmer Field School to Community IPM. Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific. FAO Community IPM Programme.

SMELTZER, S. C. and B. G. BARE, 2004. Textbook of Medical-Surgical Nursing. Lippingcott Williams and Wilkins., Vol.1., 10th Ed. P.5.

SCHUENEMAN, T. J., 1992. Journal of Extension. Vol. 30. No. 4. University of Florida-Belle Glade. http://www.joe.org/joe/1992winter/ent.html. Accessed on January 2009.

TOVIGNAN, D. S. and E. A. NUPPENAU. 2004. Adoption of Organic Cotton in Benin: Does Gender Play a Role? A Paper presented to the Conference on Rural Poverty Reduction through Research for Development and Transformation. Berlin.

VAN DEN BERG, H., 2004. IPM Farmer Field Schools. A Synthesis of 25 Impact Evaluations. Wageningen University

VAN DER WIELE, C. F., 2002. Using Integrated Pest Management – Farmer Field School as Development Relief. Unpublished Doctoral Dissertation Research, North Carolina State University, NC. USA.

VISAYAN, J. C., 2003. Competence and Empowerment of KASAKALIKASAN Trainers in Cordillera Region: An Assessment. Unpublished Doctoral Dissertation, Benguet State University, La Trinidad, Benguet.

WANAWAN, M. T., 2005. Determinants of Utilizing Organic Vegetable Technologies in Benguet Province. Unpublished Doctoral Dissertation, Central Luzon State University. Science City of Munoz, Nueva Ecija. p107, 143.

APPENDIX A

Letter to the Respondents

Republic of the Philippines
Benguet State University
GRADUATE SCHOOL
La Trinidad, Benguet

18 February 2009

_____
Municipal Agriculturist
Municipality of _____
Province of _____

Dear Ma'am/Sir:

The undersigned is currently working on a research study entitled "Farmer Field School as a Participatory Training and Research Approach to IPM in CAR" as a requirement for the degree in Ph. D. – Rural Development at the Benguet State University.

I choose to conduct the research with the intention that the results of the study can hopefully contribute in the development of upscaling activities of Farmer Field Schools. At the same time, this forms part of the documentation of the status of FFS as an educational material in Extension System.

In this regard, may I humbly ask your assistance through the FFS trainers to accomplish the questionnaire and identify four farmer graduates to also accomplish an appropriate survey forms. Rest assured, the information and data will be held confidential and acknowledged.

Very Truly Yours,

LUZVIMINDA M. PALENGLENG
Student Researcher

APPENDIX B

Control No. _____

Interview Schedule
(For FFS Trainers/Facilitators)

Part 1. A. Socio-economic Factors

1. Name: _____

2. Address: _____

3. Sex : ( ) female ( ) male 4. Age : _____
5. Civil Status: ( ) married ( ) single
6. Highest Educational Attainment: ( ) BS ( ) MS ( ) Ph. D
7. Field of Specialization in degree:
   ( ) Animal Husbandry/Vet Med ( ) Crop Protection (Entom/Plt Patho)
   ( ) Crop Science (Agro/Horti) ( ) Economics
   ( ) Extension/RD ( ) Farm Mechanization
   ( ) Forestry ( ) Home Mgt, Technology, Nutrition
   ( ) Soil Science

8. Position in government office:
   ( ) Agriculture technician ( ) Municipal Agriculturist/MAO
   ( ) Agriculturist 1,11 ( ) Sr. Agriculturist

9. Current designation in office: as Coordinator in
   ( ) HVCC ( ) Corn ( ) Rice
   ( ) Livestock ( ) Fisheries ( ) RIC/4-HClub
   ( ) Others, please specify: _____

B. FFS Experiences

1. Type of Training attended (TOT – Training of Trainers/TOS – Training of Specialists):
   ( ) TOS on: ( ) Vegetables ( ) Rice ( ) Corn
   ( ) TOT on: ( ) Vegetables ( ) Rice ( ) Corn

2. Year graduated from TOT/TOS: _____

3. No. of years you had been conducting FFS: _____

4. No. of FFS you conducted/co-facilitated/co-managed:

Commodity	Year	Number
1. Corn		
2. Rice		
3. Vegetable		
4. Fruits		
5. Livestock		
6. Chicken		
7. Agro-Forestry		
8. Child Nutrition		
9. Organic Farming		
10. Others, pls specify: _____		

C. FFS Related Trainings Attended

1. Type of FFS related trainings attended
   Crash course for ( )vegetable; ( )rice; ( )corn; ( )others, pls specify:_____

2. No. of FFS related training courses attended: _____

3. No. of FFS related consultations and workshops attended: _____

4. No. of FFS related consultations and workshops facilitated: _____

Part ll. Motivations in FFS Implementation

1. Why did you implement FFS training and research on IPM? Please choose two major reasons only?
   _____ to respond to an office mandate
   _____ to test the IPM program through FFS
   _____ to train farmers in IPM by research
   _____ to test my competences as FFS trainer
   _____ to learn and share knowledge and skill with farmers
   _____ others, please specify, _____

2. What are your motivations/goals in implementing FFS on IPM?
   _____ presence of strong support from local executives
   _____ incentives from the program (monetary, scholarships, trainings, others)
   _____ farmers reduce chemical inputs
   _____ higher income and profit of farmers
   _____ pesticide free produce commands better price

_____ safer food produced
_____ restoration and preservation of beneficial organisms
_____ enhancement of biodiversity
_____ regular encounter with farmers in the community
_____ others, pls specify _____

3. Please indicate the level of applicability by your farmer graduates using the scale: weak, moderate, and high.

Items Learned	Rating		
	WA	MA	HA
1. Reduce pesticide use			
2. Selective use of pesticide			
3. Use required amount of fertilizers			
4. Observe the fields regularly			
5. Selective use of planting materials and varieties			
6. Others, pls specify:_____			

4. Please indicate the degree of observability or visibility of effects manifested by your trainees using the scale.

Effects of FFS manifested by Farmer graduates	Rating		
	NO	MO	HO
1. Increase in income			
2. Better in profit			
3. Change in farming practice/s from previous to current			
4. Reduction in chemical inputs			
5. Farmer became more vocal or more involved in community affairs			
6. Farmer became generous to share his technology to co farmers			
7. Farmer do own simple experiments			
8. Others, pls specify: _____			

5. Please indicate how many percent of your farmers applied what they learned?

Items Learned	Percent (%) of farmers who applied each item							
	5-10	11-20	21-30	31-40	41-50	51-60	61-70	71 & above
1. Reduced Pesticide Use								
2. Selective use of pesticide								
3. Used required amount of fertilizers								
4. Observed the fields regularly								
5. Selective use of planting materials and varieties								

Part lll. Extent of FFS Implementation in terms of the FFS Principles, Features and Characteristics

1. Please indicate the degree of the effect of the FFS features and characteristics on the quality of FFS training and research using the scale:

FFS Features and Characteristics	Low	Mod	High
1. Methodology: uses discovery based, hands on, experiential, facilitation technique and use of guide questions			
2. Duration : one cropping period = planting to harvesting			
3. Number of Participants : 25-30 participants			
4. Time of Day (8:00 – 12; 7:00 – 11:00)			
5. Number of hours (4 hrs)			
6. Subject Matter/Focus Topic: IPM			
7. Sequence or Program of Activities (opening prayer, recap, present activity for the day, AESA, group dynamic activity/unfreezing activity, special topic, evaluation, planning and closing			
8. Research theme: IPM			
9. Research Design: Farmer Crop Protection Practices versus IPM Practices			

10. Field monitoring-conduct of weekly Agro Ecosystem Analysis			
11. Conduct insect zoos, disease zoos			
12. Conduct of Field Day and Graduation			
13. Calculation of incomes and profits of FFS			
14. Others, please specify:			

2. Please indicate the level of adaptability of each of the FFS features and characteristics in your locality when you implemented your FFS training and researches using the rating.

FFS Features and Characteristics	Low	Mod	High
1. Methodology: uses discovery based, hands on, experiential, facilitation technique and use of guide questions			
2. Duration : one cropping period = planting to harvesting			
3. Number of Participants : 25-30 participants			
4. Time of Day (8:00 – 12; 7:00 – 11:00)			
5. Number of hours (4 hrs)			
6. Subject Matter/Focus Topic: IPM			
7. Sequence or Program of Activities (opening prayer, recap, present activity for the day, AESA, group dynamic activity/unfreezing activity, special topic, evaluation, planning and closing			
8. Research theme: IPM			
9. Research Design: Farmer Crop Protection Practices versus IPM Practices			
10. Field monitoring-conduct of weekly Agro Ecosystem Analysis			
11. Conduct insect zoos, disease zoos			
12. Conduct of Field Day and Graduation			
13. Calculation of incomes and profits of FFS			
14. Others, please specify:			

3. Please indicate the level of appropriateness of each of the FFS features and characteristics in your area using the scale:

FFS Features and Characteristics	NA	MA	HA
1. Methodology: uses discovery based, hands on, experiential, facilitation technique and use of guide questions			
2. Duration : one cropping period = planting to harvesting			
3. Number of Participants : 25-30 participants			
4. Time of Day (8:00 – 12; 7:00 – 11:00)			
5. Number of hours (4 hrs)			
6. Subject Matter/Focus Topic: IPM			
7. Sequence or Program of Activities (opening prayer, recap, present activity for the day, AESA, group dynamic activity/unfreezing activity, special topic, evaluation, planning and closing			
8. Research theme: IPM			
9. Research Design: Farmer Crop Protection Practices versus IPM Practices			
10. Field monitoring-conduct of weekly Agro Ecosystem Analysis			
11. Conduct insect zoos, disease zoos			
12. Conduct of Field Day and Graduation			
13. Calculation of incomes and profits of FFS			
14. Others, please specify: _____			

4. If you are to go back to your FFS training and research graduates to conduct another FFS, please indicate the level of relevance of each of the FFS features and characteristics to the same group of farmers using the scale:

Current FFS Features and Characteristics	Rating		
	NR	MD	HR
1. Methodology: uses discovery based, hands on, experiential, facilitation technique and use of guide questions			
2. Duration : one cropping period - planting to harvesting			
3. Number of Participants : 25-30 participants			

4. Time of Day (8:00 – 12; 7:00 – 11:00)			
5. Number of hours (4 hrs)			
6. Subject Matter/Focus Topic: IPM			
7. Sequence or Program of Activities (opening prayer, recap, present activity for the day, AESA, group dynamic activity/unfreezing activity, special topic, evaluation, planning and closing			
8. Research theme: IPM			
9. Research Design: Farmer Crop Protection Practices versus IPM Practices			
10. Field monitoring-conduct of weekly Agro Ecosystem Analysis			
11. Conduct insect zoos, disease zoos			
12. Conduct of Field Day and Graduation			
13. Calculation of incomes and profits of FFS			
14. Others, please specify:			

5. Please indicate the degree of effect of the IPM-FFS principles, features and characteristics on the income and profit of farmer using the scale: ( )weak, ( )moderately strong, ( )very strong

6. Please indicate the degree of effect of the IPM-FFS principles, features and characteristics on the adaptability of IPM technologies by farmers using the following scale: ( )weak, ( )moderately strong, ( )very strong

Part lV. Changes made in the IPM – FFS Principles, Features and Characteristics

1. Please indicate the changes or modifications you made in the FFS features and characteristics to fit the conduct of your FFS training and research?

FFS Features and Characteristics	No change	Modified
1. Methodology: uses discovery based, hands on, experiential, facilitation technique and use of guide questions		
2. Duration : one cropping period - planting to harvesting		
3. Number of Participants : 25-30 participants		
4. Time of Day (8:00 – 12; 7:00 – 11:00)		

5. Number of hours (4 hrs)		
6. Subject Matter/Focus Topic: IPM		
7. Sequence or Program of Activities (opening prayer, recap, present activity for the day, AESA, group dynamic activity/unfreezing activity, special topic, evaluation, planning and closing		
8. Research theme: IPM		
9. Research Design: Farmer Crop Protection Practices versus IPM Practices		
10. Field monitoring-conduct of weekly Agro Ecosystem Analysis		
11. Conduct insect zoos, disease zoos		
12. Conduct of Field Day and Graduation		
13. Calculation of incomes and profits of FFS		
14. Others, please specify:		

2. If you are to go back to your FFS training and research graduates to conduct another FFS, what do you recommend to modify or improve in the principles, features and characteristics of FFS to improve the profitability of farming activities the farmers?

FFS Features	Suggested Changes
1. Methodology: uses discovery based, hands on, experiential, facilitation technique and use of guide questions	
2. Duration : one cropping period = planting to harvesting	
3. Number of Participants : 25-30 participants	
4. Time of Day (8:00 – 12; 7:00 – 11:00)	
5. Number of hours (4 hrs)	
6. Subject Matter/Focus Topic: IPM	
7. Sequence or Program of Activities (opening prayer, recap, present activity for the day, AESA, group dynamic activity/unfreezing activity, special topic, evaluation, planning and closing	
8. Research theme: IPM	
9. Research Design: Farmer Crop Protection Practices versus IPM Practices	

10. Field monitoring-conduct of weekly Agro Ecosystem Analysis	
11. Conduct insect zoos, disease zoos	
12. Conduct of Field Day and Graduation	
13. Calculation of incomes and profits of FFS	
14. Others, please specify:	

3. If you will conduct FFS training and research in the future for other crops/commodity, what crop/commodity do you suggest?_____

APPENDIX C

Control No. _____

Interview Schedule
(For Farmer FFS Graduates)

Part 1: A. Socio-economic Factors

1. Name: _____

2. Address: _____

3. Sex : ( ) Female ( ) Male 4. Age: _____

5. Highest Educational Attainment: ( ) Elementary ( ) High School ( ) College

6. Year when trained in FFS _____

7. During your FFS training, what crop did you use?, and what variety?

Crop	Variety
1	1
2	2
3	3

8. What crop/s do you plant now?, and what variety/ies?

Crop	Variety
1	1
2	2
3	3

9. Can you estimate an average (per hectare) (or per land area for vegetables) of how much you saved and earned from practicing what you learned when you attended FFS?

Benefits	Amount/Vol.
1. Cost of pesticide inputs	
2. Cost of fertilizer inputs	
3. Cost of labor	
4. Increase in production	
5. Increase in income	
6. Increase in profit	

Part ll. Motivations in Attending and Applying Learning from FFS on IPM

1. What were your motivations/goals in attending the FFS training and research before?
   _____cannot refuse trainers who invited me to join, i know her/him well, and he/she is a friend
   _____ influenced by my neighbor who is attending the training
   _____ persuaded by the presence of friends in the training
   _____ cannot refuse the local officials/leaders who invited them to attend
   _____ expected to learn new things from the training
   _____ expected to get any support or material things after the training
   _____ convinced with the objectives of the training
   _____ was an inspiration to others
   _____ others, pls specify _____

2. What are your motivations/goals in applying what you learned from the FFS training and research?
   _____ reduced pesticide cost and usage
   _____ reduced fertilizer cost and usage
   _____ higher income and profit
   _____ higher yield
   _____ safer food produced
   _____ restoration and preservation of beneficial organisms
   _____ cleaner environment
   _____ others, pls specify _____

Part lll. Application of Lessons Learned in FFS on IPM

1. Was it easy to practice or apply what you learned from the FFS-IPM training?
   ( )Yes, Why? _____
   ( )No, Why? _____

2. Please indicate the level of your application of learning using the scale of weak, moderate and high.

Learning	W	M	H
1. Conduct regular field monitoring			
2. Consider pesticide as the last resort to control pests			
3. Use proper amount of fertilizers at the right time			

4. Practice crop sanitation at all time			
5. Check presence of beneficial organisms in the farm regularly			
6. Check presence of harmful organisms in the farm regularly			
7. Assess crop damages regularly			
8. Compute income, profit, and yield increase from FFS practice			
9. Conduct own research in my field			
10. Do farm recording			
11. Others: please specify:_____			

3. Please indicate the level of effects of applying your learning using the scale: ( ) Weak, ( ) Moderate, ( ) High.

4. Please give your reason/s for applying what you learned from IPM - FFS training and research?

Learning	Reason for applying
1. Conduct regular field monitoring	
2. Consider pesticide as the last resort to control pests	
3. Use proper amount of fertilizers at the right time	
4. Practice crop sanitation at all time	
5. Check presence of beneficial organisms in the farm regularly	
6. Check presence of harmful organisms in the farm regularly	
7. Assess crop damages regularly	
8. Compute income, profit, and yield increase from FFS practice	
9. Conduct own research in my field	
10. Do farm recording	
11. Others: please specify:_____	

5. If FFS training and research will be organized again, do you want to follow or modify any of the FFS features and characteristics to better address the profitability of your farming activity? Please suggest any modification.

FFS Features and characteristics	Follow	Modify	Suggested Modification
1. Methodology: uses discovery based, hands on, experiential, facilitation technique and use of guide questions			
2. Duration : one cropping period = planting to harvesting			
3. Number of Participants : 25-30 participants			
4. Time of Day (8:00 – 12; 7:00 – 11:00)			
5. Number of hours (4 hrs)			
6. Subject Matter/Focus Topic: IPM			
7. Sequence or Program of Activities (opening prayer, recap, present activity for the day, AESA, group dynamic activity/unfreezing activity, special topic, evaluation, planning and closing			
8. Research theme: IPM			
9. Research Design: Farmer Crop Protection Practices versus IPM Practices			
10. Field monitoring-conduct of weekly Agro Ecosystem Analysis			
11. Conduct insect zoos, disease zoos			
12. Conduct of Field Day and Graduation			
13. Calculation of incomes and profits of FFS			
14. Others, please specify:			

6. If you are to attend FFS training and research again, what particular topic would like to talk about?

Number	Topics	Reason
	Integrated Pest Management	
	Integrated Soil Fertility Management	
	Organic Farming	
	Food Processing	
	Marketing	
	Good Agricultural Practices	
	Farm Enterprise	
	Others; please specify:	

7. Any other Comment about the FFS on IPM:

_____

APPENDIX D

Acronyms

AESA	Agro Ecosystem Analysis
ATI	Agricultural Training Institute
DA	Department of Agriculture
CAR	Cordillera Administrative Region
FFS	Farmer Field School
FCPP	Farmer Crop Protection Practices
HADP	Highland Agriculture Development Project
HVCC	High Value Commercial Crops
IIBC	International Institute of Biological Control
IPM	Integrated Pest Management
LGU	Local Government Units
OAS	Office of the Agricultural Services
OPAg	Office of the Provincial Agriculturist
PAENRO	Provincial Agriculture, Environment and Natural Resource Office
RFU	Regional Field Unit
TOS	Training of Specialists
TOT	Training of Trainers
UNFAO	United Nations Food and Agriculture Organization

BIOGRAPHICAL SKETCH

The author was born on 21 July 1964 in Gueday, Besao, Mt. Province. She finished her elementary education at Agawa Elementary School and secondary education at St. James' High School, Besao, Mt. Province. She finished Bachelor Science in Agriculture major in Plant Pathology and minor in Soil Science in 1988 and Master of Science in Plant Pathology in 2004 at the Benguet State University. While studying, she served as an Assistant Dormitory Matron, and Dormitory Matron of the then St. Ursula's Dormitory, an Anglican church institution at Km 5, La Trinidad, Benguet from 1987 to 1990.

In October 1987 to June 1989, she worked as sales clerk and promoter of biopesticide (*Bacillus thuringensis*) with ABBOT AgroChemical Company. Stationed in the agro-store not only exposed her to the variety of agrochemicals that ranged from the most toxic to biological pesticides used in agriculture not only in the region but also in nearby regions. She also witnessed how fast pesticides were dislodged from the shelves of the store.

As a research assistant of the RP-German Biological Plant Protection Project, from July 1989 to May 1990, she had been rearing biological control agents: *Diadegma semiclausum* and *Cotesia plutella* together with their host – *Plutella xyllostella* (diamond back moth) which is also a host for the production of *Bauveria sp.* at the laboratory of the Northern Philippine Root Crop Research and Training Center (NPRCTC), BSU, La Trinidad, Benguet.

In June 1990 to May 1994, she landed as agriculturist of the Highland Agriculture Development Project (HADP) where she started to acquire knowledge, skill and processes in farmer participatory research, extension and training. Researches conducted with farmers focused on adaptability trials including the use of *Diadegma sp*. These skills were further enhanced through works with the International Institute of Biological Control (IIBC – CAB International), from May 1994 to Sept. 1996. This was the massive promotion of Biological Control as the flagship of Integrated Pest Management through the Farmer Field School approach of research, extension and training. Through this works, the author was able to share these skills and knowledge to her colleagues in the agriculture sector as trainer-facilitator in the conduct of National and Regional Vegetable Integrated Pest Management Training of Specialists (TOS), Training of Trainers (TOT), Crash Courses, Refresher Courses, and Farmer Field Schools in various barangays in selected parts of the country.

This background also has brought the author to international trainings and workshops as resource person and consultant, to the Masters Training Ecological Crop Management of Vegetable in Trinidad and Tobago, West Indies in 2002, Sensitization Workshop on Farmer Participatory Approaches for Policy Makers in the Caribbean Region in 2002; Regional Workshop on Farmer Participatory Approaches to Ecological Crop Management in Trinidad & Tobago, West Indies, 2000, and the International Training Course and Workshop on the Evaluation of

Pesticide Effects on Natural Enemies and its Implication to Pesticide Registration in Malaysia, 1995.

In her commitment to reach out more Filipino farmers, she joined the Agricultural Training Institute – Cordillera Administrative Region as Training Specialist ll from 1997 until March 2009.

The author further served as FFS international consultant to the Rural Enterprise and Small Scale Commercial Agriculture Development Project (RESCADP) with the World Bank in the Republic of Armenia in August and November 2008; and to the UNDP Tsunami Recovery Program – Livelihoods Project in the Republic of Maldives from August 2007 – March 2008.