

IMPACT OF THE IMPLEMENTATION OF THE PARTI-
CIPATORY APPROACH BY FIELD EXTENSION
WORKERS ON RICE FARMING: A CASE
STUDY IN THE DAERAH ISTIMEWA
YOGYAKARTA

By

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Scope and Method of Study: This study analyzed the extent of the implementation of the participatory approach by Field Extension Workers (FEWs) and its effects on bringing about permanent changes in rice farming. It is a case study restricted to the Daerah Istimewa Yogyakarta, Indonesia, with areas covered of those where farmers grow rice and are served by the T & V Extension System, and with 156 FEWs and 140 Contact Farmer Leaders involved.

Three groups of FEWs, named as Lower, Middle, and Upper-Group, as classified from 142 FEWs population due to the degree of the implementation of the participatory approach were subjects for the analyzes. Various measurements were implemented. The emphasis was put on the comparison measurement of the specific characteristics and the degree of the working accomplishment of the three groups.

Findings and Conclusions: The Upper-Group exceeded the two other groups in most cases being analyzed: the implementation of the participatory approach, being familiar with farm life, living close-by and knowing the working area, capabilities for developing farmer groups, perceiving positively the supporting agencies, and accomplishments of the seven selected extension targets. It appears that the effects of the implementation of the participatory approach were real and positive as they could be traced through the better performances of the Upper-Group and the well acceptance of the T & V. Extension System by the farmers.

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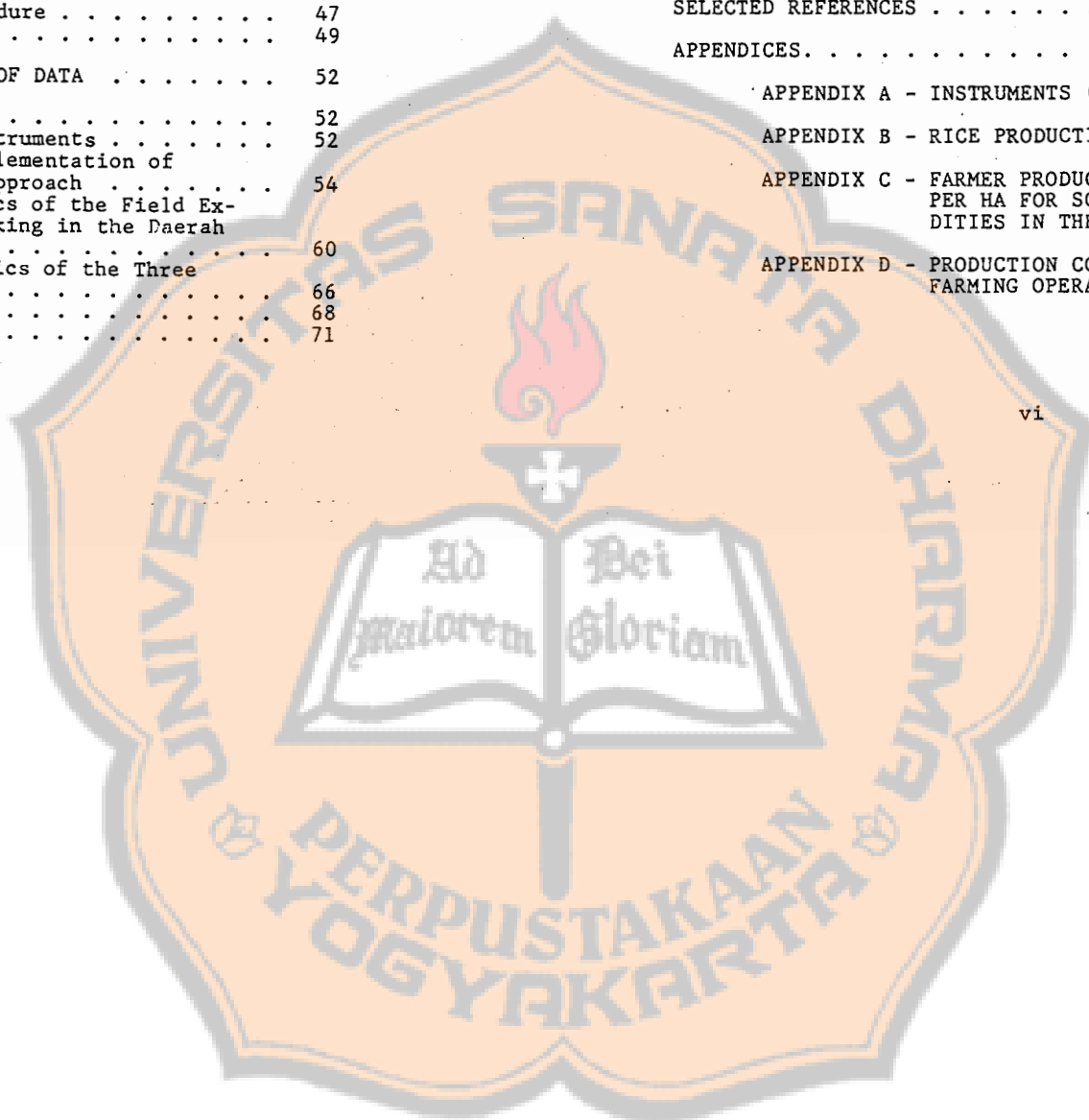
Sincere appreciation is given to Rev. William T. Wood, S. J., who in the name of the New York Province Society of



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CHAPTER I

INTRODUCTION

Rice production increased in Indonesia from 10,435,000 metric tons in 1968 to 20,163,000 metric tons in 1980. Many feel that this increase resulted from the willingness of rice farmers to adopt new and more effective technology as related to production. However, after the initial spurt early in the period, there was a leveling-off period which began in about 1974 and lasted until about 1978, during which time rice production remained fairly constant.

In 1977, the Indonesian Ministry of Agriculture introduced a new agricultural extension system called a "Training and Visit" system and then followed it by a special rice intensification program ("INTensifikasi khuSUS" = INSUS) in which farmers were grouped for extension purposes by irrigation units. Farmers were then given information and training regarding new rice varieties, fertilizer usage, insecticide usage, pesticide usage, water requirements, cropping systems, post-harvest treatments, and the economics in the input/output ratios. More importantly, the groups were given freedom to decide which of the technical inputs they would adopt for their particular conditions. Thus, the major roles of the extension agents were to educate and guide the farm-

farmers, providing credit for purchase of inputs if needed and requested. Results of a 1980 study in East Java indicated that when organized into INSUS groups, rice production increased from an average of 4.8 tons/Ha to 8.7 tons/Ha (AARD, 1981).

Statement of the Problem

The participatory approach, just as described and implemented by Field Extension Workers in Indonesia, appears to have caused long-term changes in the rates of adoption of new technologies for use in increasing rice production, and it appears that these changes are real and might become permanent. However, to determine if these benefits are real, it will be necessary to determine to what extent the Field Extension Workers, by implementing the participatory approach, have actually brought about desired changes in rice production. The Daerah Istimewa Yogyakarta (DIY), an Indonesian province, was chosen as the location of this case study because of its long experience in conducting an agricultural development pilot project as well as for its great educational influences. Rice production was chosen to be the subject of this study because it is the major staple crop in Indonesia and has higher production potential, even on the densely-populated island of Java.



Purpose of the Study

The purpose of this study was to determine if the level of implementation of the participatory approach by the Field Extension Workers (FEWs) had influenced rice farming and production in the Daerah Istimewa Yogyakarta.

Objectives

The objectives formulated to accomplish the purpose of the study were as follows:

1. To measure the degree that the FEWs in the DIY had implemented the participatory approach in their extension works.
2. To classify the FEWs in the DIY into three different groups based upon the extent of their implementation of the participatory approach.
3. To describe the specific characteristics of the three groups.
4. To compare the accomplishments of the three groups in bringing about changes in rice farming through these seven selected extension targets: 1) the appropriateness of recommendations, 2) number of farmers who adopted the recommended practices, 3) the ability of FEW to readily identify farmer problems, 4) the ability of FEW to solve farmer problems, 5) the development of the abilities of farmer groups to work as group, 6) rice production by farmers, and 7) rice farmer incomes.

Assumptions

Certain assumptions were accepted as basic to the study, including:

1. It was assumed that FEWs who had been working under the Training and Visit Extension System for more than 1 year had some degree of experience in implementing the participatory approach principles as developed by the system.
2. It was assumed that FEWs could be ranked on the basis of the degree that the individuals implemented the participatory approach.
3. It was assumed that the FEWs chosen to be the respondents at the preliminary test had sufficient knowledge and experience that enabled them to provide valid information.
4. It was assumed that the degree of accomplishment by Field Extension Workers could be judged by their close-partners in the field, the contact farmers.
5. It was assumed that all village administration units had up-to-date quantitative data relating to the area of rice farming, total production, production per hectare, and estimation of rice farmer income for one hectare of rice farming operation.

Scope and Limitations of the Study

In this study the participatory approach refers to a new system developed within the Indonesian Training and Visit Extension System which allows for a more active



participation by the farmers. No fixed pattern has been established, as the approach is developing. However, national guidelines have been given to FEWs who have freedom to develop detailed procedures. The key to success is the FEWs' abilities to develop relations with farmer groups in order to merge the inputs of farmers with those of the FEWs. This study was restricted to the Daerah Istimewa Yogyakarta, Indonesia, which was one of the early adopters of the Training and Visit Extension System. Areas being covered were those where farmers grow rice as their main crop. The FEWs were limited to only those still working in the field. There were 156 FEWs and 140 contact farmer leaders involved in this study. Fourteen of the FEWs were involved in dealing with the carrying of the one-month test-retest procedure to measure the reliability of the instruments.

Definition of Terms

For the purpose of this study the following definitions are given:

1. Field Extension Worker (FEW) = An agricultural extension agent who works at the village level and supervising about 16 contact farmer leaders and about 1,600 - 3,200 farmers. The Indonesian equivalent is Penyuluh Pertanian Lapangan (PPL).

2. Agricultural Extension Officer (AEO) = An agricultural extension agent who supervises and provides

technical support to the FEWs. The Indonesian equivalent is Penyuluh Pertanian Madya (PPM).

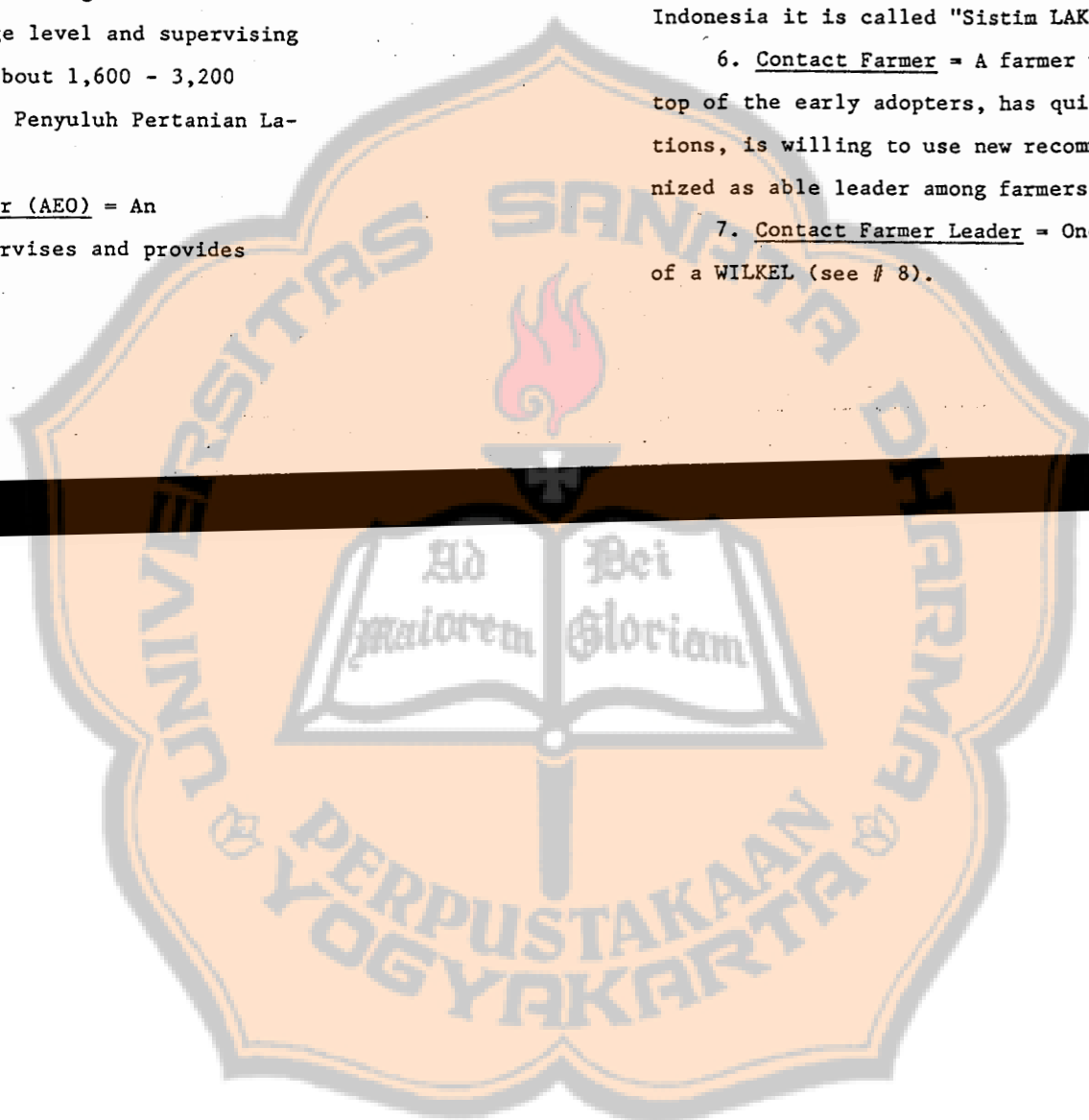
3. Subject Matter Specialist (SMS) = An agricultural extension agent who has University training background in specialized subjects. The Indonesian equivalent is Penyuluh Pertanian Spesialis (PPS).

4. Participatory Approach = An approach which allows more active participation from the farmers so that adoption process of innovations becomes a "bottom-up" process. It is a decision making process by farmers in dealing with the selection of innovations introduced by the extension agents, the development of group program planning, its execution and evaluation, the provision of information and services needed by farmer group members, and the organization of the activities groups.

5. Training and Visit Agricultural Extension System (T&V System) = One in which extension activities are concentrated on the extension agent trainings and farmer visits, scheduled on a regular basis and directed toward providing superior information, advice, and service to farmers. In Indonesia it is called "Sistim LAKU".

6. Contact Farmer = A farmer who is classified as the top of the early adopters, has quick response to innovations, is willing to use new recommendations, and is recognized as able leader among farmers.

7. Contact Farmer Leader = One chosen to be the leader of a WILKEL (see # 8).



8. WILKEL = A Group-Area-Unit, the operation area for a large farmer group (100 farmers) under the leadership of a Contact Farmer Leader.

9. Farmer Group = A group of farmers formed under the Training and Visit Extension System in which the farmers meet regularly for discussing field problems, for reviewing the implications of the agricultural recommendations, and for implementing innovations that were chosen by the group after many discussions. A farmer group consists of around 100 farmers and is based on contiguous field areas covering one WILKEL (see # 8).

10. Activity Groups = Those that consist of adult, young farmers, farmer wives, and rural women, which have specific activities, such as: radio listening, watching television, reading books/bulletins/brochures, pest and disease control, irrigation water distribution, or various women activities. Some Activity Groups have Indonesian names, such as: "Klompén", "Klompér", "KPT", "KTW", "OPPA", "RPH", "KTDH".

11. "Panca-Usaha" = A package of agricultural technology that was developed in Indonesia since the 1960s, consisting of five-farm principles: 1) the use of high-yielding rice varieties, 2) the use of water-management systems in accord with the water requirement of the crops concerned, 3) the proper use of fertilizers, 4) the use of proper methods

for the control of pests and diseases, and 5) the use of appropriate cropping techniques.

12. Variable = A factor in this study which can be measured quantitatively for analysis purpose. There are nine variables in this research project of which two were used for classification purposes (Variables A & B) and seven were used for comparison purposes (Variables C, D, E, F, G, H, and I).



CHAPTER II

REVIEW OF LITERATURE

This review, which presents an overview of materials related to the subject of the study, is divided into four major areas plus a summary, as follows: 1) The Participatory Approach as Developed in Agricultural Research and Development, 2) Benefits of the Participatory Approach, 3) The Participatory Approach for Field Extension Workers, 4) The Adoption of Training and Visit Extension System in Indonesia, and 5) Summary.

The Participatory Approach as Developed in Agricultural Research & Development

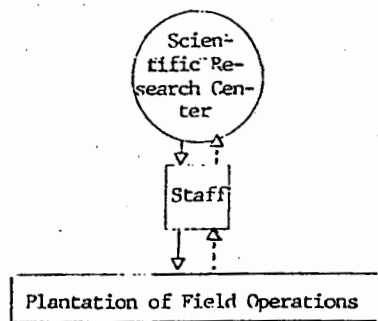
Whyte (1981) reported that there are at least three models of agricultural research and development which were developed in developing countries. The first model is known as the "European colonial" model, the second is called the "transplanted", or the "United States" model, and the third is called the "participatory" model. In terms of structure, the first is described as a "vertical" one where initiations of changes usually come from above; initiation of changes from below is rare. The second model is the "horizontal"

model where flow of communications is at the same level. In the third model, communications are more integrated permitting a "bottom-up" approach in which farmers as a group participate in the decision making process as regards to which technologies to adopt. The main differences can be seen by a study of Figure 1.

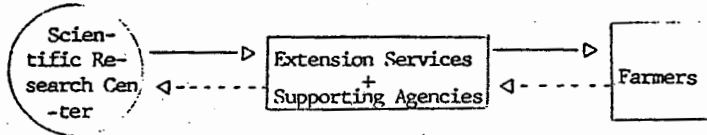
The third model is indicative of the general approach developed in projects, such as: Commilla in Bangladesh, CADU in Ethiopia, Puebla in Mexico, Caquenza in Colombia, ICTA in Guatemala, PNIA in Honduras, On-Farm Adaptive Research (OFAR) in Guinea, MIDAS in Ghana, and On-Farm Collaborative Research in India (Whyte, 1981; ICRISAT, 1982; IITA, 1983). It appears that the third model can be used to represent new agricultural development approach that was developed in several developing countries around the principles of the participatory approach.

Compton (date unknown), after reminding the readers of the evolutionary stages of agricultural development as influenced by research and extension, suggested that there must be interaction among researchers, extension agents and farmers if any program is to become effective over a long time period. Therefore, he suggested another name for the participatory approach, the Interactive-Knowledge-Creation-Diffusion-Utilization approach. Its implication, he reports, is that in order for any program to be effective, the new scientific knowledge resulting from the works of scientists must match the needs and problems of farmers, as they view

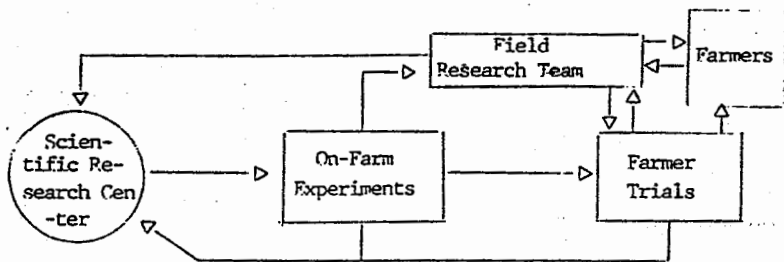




A. "Vertical" Model of Agricultural R & D.



B. "Horizontal" Model of Agricultural R & D.



C. "Integrated" Model of Agricultural R & D

———— = High Frequency of Communication and Initiation of Action.
 ----- = Low Frequency of Communication and Initiation of Action.

Figure 1. Three Different Models of Agricultural Research and Development

these. Otherwise the farmers may adopt the technologies resulting therefrom. In this system, the extension agents must be the "middle men": they must understand the new technologies but must also serve as educators to explain these as well as the cost/benefits of these when applied. Farmers, in turn, when armed with this knowledge choose the technologies that they wish to use.

Since "participatory approach" and "interactive-knowledge creation-diffusion-utilization approach" refers to the same approach it was decided to use the term "participatory approach" to refer to this.

Many people have pointed to the importance of the participatory approach for developing countries, feeling that the problems of lack of food and the prevalence of poverty in these countries cannot be alleviated unless the millions of small farmers, living in the agricultural areas, are given opportunities to become active participants in the total agricultural development process (Whyte, 1983). The European Colonial approach and the transplanted approach used in the United States failed to create the necessary changes in these millions of small farmers. The Green Revolution, supported by the two previous approaches, was partially effective for the farmers at the top level and much less so with the small subsistence farmers. Wickramasinghe (1982) reported that the Green Revolution benefitted the affluent farmers more than the small farmers, an idea advanced by Mosher (1971), Bradford (1974), Castillo (1976), Oluwasanmi



(1976), Rhoades (1977), Wittwer (1977), Khan (1978), and the IADS (1982).

Inequality problems, related to the failure of the Green Revolution to alleviate the problems of small farmers in the developing countries didn't appear to be empirically evident when the packets developed by the Green Revolution were put into practice. According to Hayami (1984) empirical evidence indicates that growing inequality in rural sectors of developing countries was not a result of the Green Revolution, but resulted from insufficient progress of the Green Revolution technology in overcoming the growing population pressure on land. The man:land ratio deteriorated rapidly in many developing countries. For example, within a fifty-year period, the average number of workers per hectare of arable land doubled. Micro studies (Ruttan, 1977) for various parts of Asia indicates that neither farm size nor land tenure were serious constraints to the adoption of the Green Revolution technology. Also, neither farm size nor land tenure were important sources of differential growth in productivity in this region. In other words, it appears that the Green Revolution can benefit the small farmers as much as the more affluent ones and that inequality problems have no direct relation to the effectiveness of the utilization of Green Revolution technology.

Other critiques have been directed to the kind of extension approach used during the implementation of the Green Revolution campaign. It appears that the extension approach

implemented at that time bypassed many important factors, such as, indigenous agricultural knowledge, innovative skills of local farmers, and even those needs and interests which the farmer thought were important (Compton, 1983).

Lionberger (1982) described the kind of approach above as the "hard-sell-approaches". In order to be effective, the hard-sell approach has to be implemented selectively: extension agents would work with only "seeker-first-farmers" who are classified as innovator farmers and early adopter farmers. It has been pointed out that extension agents were able to show more progress when working only with these farmers, who are usually financially better-off, are better educated, have more available resources, and can make better use of the services and assistance provided. The hard-sell-approach has been used in many parts of the world and those who advocate it believe that by the diffusion process, the technology will be trickled down from the innovator and early adopter farmers to the other farmers, who are classified as the later adopters and laggard farmers. Unfortunately, the trickle-down process does not always work as expected. Since nonseeker farmers do not adopt, only innovators and early adopter farmers reap the benefits of the extension program.

The participatory approach has been promoted by many as the best alternative for the solution of the problem of the widening gap between the small group of innovators plus early adopter farmers and the majority of farmers. However,



the cost of developing this extension program is much higher than that of the older systems. Also achievements of this by extension agents are slower and less dramatic than in other approaches. Extension agents are required to be able to listen in order to learn more from their contact with farmers. Relationships with farmers at the same times must be established on a one-to-one basis. In fact, Lionberger (1982) has reported that in order to reduce the knowledge gap between the two farmer groups, innovations (information, concepts, and technology) must be developed in a manner disproportionately suited to the needs of the majority of the farmers. In order to accomplish this, more agricultural researches and extension works must be done close by or on farmer fields. Researchers, extension agents, and farmers must be able to interact and work together on a more equal basis.

Benefits of the Participatory Approach

Hofstede (1971), through his study dealing with processes of community decision-making in four West Javanese rural villages, found that the participation of formal and informal leaders, and common villagers in the community decision-making processes reduced delays in the implementation and carrying out of the village projects. When only formal and informal leaders participated in the decision-making process, there were sporadic delays in the execution of the projects. The participation of the informal leaders

appeared to be the most important because if informal leaders did not participate, many of the common villagers also did not participate. Hofstede (1971) also described the usual process of decision making in villages, finding two phases as follows: 1) an initiation phase, and 2) a legitimization phase. In the initiation phase participation of the villagers was not so important. However, in the legitimization phase, participation of the villagers was most important. It appears that the more intensive the participation of the villagers in the decision making process, the more efficient and smooth is the execution of the projects.

Rogers (1971) reported that there is one big difference between what he called "authoritative" and "participative" approaches: the first provides for faster changes but these do not become permanent, while the second provides for slower but more permanent changes. Therefore, in a long term process, the participatory approach appears to offer better prospects for success. Other beneficial effects that one might expect from the participatory approach are the possible growth and use of the indigenous system of agricultural knowledge, an increase in farmer interests, and recognition of those innovations that come from the farmers (Compton, 1984). These tend to make for their stronger commitment to the program.

In general, community educators feel that there will be no developments unless people participate actively in the whole process. All the concerned people must be involved



from the very beginning of the process related to the development of a program for increasing rice yields and it is only through participation that people will learn how to take charge of their lives and solve their own problems (Bunch, 1982; United Nations, 1978; Hunter, 1971). Increased rice production will follow these developments.

The participatory approach in the management field was discussed in the study of Coch and French (1960). This study provided evidence that in a factory where managers and employees were able to discuss together their proposed technological changes, productivity increased and resistance to change decreased.

In the management field, Hersey (1972) introduced two different concepts of change cycle. The first was named "participative change cycle" while the second was called the "coerced change cycle". The participative change cycle lasts longer than the coerced one as it occurred when the whole group was able to develop a positive attitude and commitment for the desired change. For this to happen, the group must be mature and the members must have a degree of knowledge and experience that will allow them develop the kinds of strategies to accomplish the desired goal.

It is clear that the participatory approach works effectively only if there are certain degrees of knowledge and experience within the group and certain conditions in terms of problematic leadership situations (Likert, 1967; Fiedler, 1967; Korman, 1966; Hare, 1965; Gibb, 1964; Pelz, 1961).

Whether the participatory approach can work effectively in the developing countries also depends on the local cultures (Bunch, 1982).

The essence of the participatory approach implemented in adult education should be "helping people change themselves." It assumes a change agent is sincere in his desire to work with people; understands thoroughly people's needs, motivations, desires, and resources; uses no coercion or force to obtain his ends; and does not underrate those he wishes to help. The role of a change agent is to prepare people so that they notice something, want something, do something, and get something (Maunder, 1972). The participatory approach creates conditions where adult learners can involve themselves in the process of education. Through use of the participatory approach, the extension agent is able to find out how the farmers think and feel, what are their attitudes, customs, fears, inhibitions, habits, and skills. All of these internal factors can influence farmers in the decision-making process as to whether to adopt or reject proposed innovations.

Returning to the problem of the millions of small farmers living in the Third World countries, there still remain many questions, such as: How can opportunities be arranged and taught so as to help these small farmers become active participants? In what ways can the participatory approach be implemented at the small farmer level? Do these farmers have enough knowledge and skills for effective participation?



These questions and many others are discussed in the following section.

The Participatory Approach for Field Extension Workers

Many of the empirical studies on this subject were done in the form of case studies (Allo and Schwass, 1982; Compton, 1982; Sharland, 1982; Wickramasinge, 1982; Maeda, Ghai, and Green, 1981; Brandt, 1980; Ratnapala, 1980). These studies make it evident that success in using the participatory approach is due not only to the condition of a Field Extension Worker but to the conditions of the people. In a village where people do not yet have experiences on the decision-making process on a group basis the participatory approach might be more destructive than constructive (Bunch, 1982). The success of the participatory approach depends upon the beliefs of Field Extension Workers and people they serve. For example, the Sarvodaya movement in Sri Lanka developed the participatory approach successfully because social workers in the movement and the people that they serve believe in "dana" (sharing), "priyavacana" (pleasant speech), "arthacharya" (constructive activeness), and "samanathmatha" (equality). These traditional Buddhist principles have functioned as the foundation for the participatory approach (Compton, 1982). The success of the participatory approach also depends upon the willingness of the people to involve themselves in the programs. For exam-

ple, the "Ujamaa" movement in Tanzania is considered to be a good example of an effective participative movement because the village people there have shown a strong willingness to participate in communal activities (Maeda, Ghai, and Green, 1981).

The participatory approach as it has developed in Indonesia deals with the formation of farmer groups based upon the spirit of the traditional rural cooperatives such as: a farmer association for use of irrigation water ("subak"), farmers' self-help associations ("gotong-royong"), and a farmer mutual assistance association ("mapalus") (Sukaryo, 1983). The Indonesian government has always attempted to adapt traditional socio-cultural associations (subak, gotong-royong, and mapalus) in forming groups for agricultural extension purposes. The traditional group activities seem to have a close parallel with the kinds of groups developed within the Training and Visit Extension System. The formation of farmer groups in Indonesia has given a good insight on the use of traditional communal structures as a basis for the development of an effective participatory approach in Indonesian villages.

Lionberger (1982) reported that at the field level, the participatory approach assumes an existence of mental capabilities in the farmers. For example, farmers are assumed to have capabilities for making good management decisions. But the most important is that these capabilities be recognized by the Field Extension Workers (FEWs). The perceptions of



the FEWs of their farmer clientele determine the probabilities for implementing the participatory approach. In fact, before FEWs are able to implement this approach, they must prepare the farmers in order to have the specific kinds of capabilities needed; this requires effort and training. Also, the participatory approach should be implemented gradually, (Bunch, 1982) as it is a process. Benor (1977) discussed a self-reinforcing process for building self-confidence in the FEWs and farmers, resulting in enthusiasm in both. The FEWs must have strong motivation in order to work hand in hand with the farmers, and farmers must have confidence in their FEWs in order for the endeavor to be successful.

The situation of extension services in the developing countries is rather different from one in the developed countries. Such a situation was described by Adams (1982) as follows:

In economically advanced countries, the ratio of extension workers to farmers lies between 1 : 350 and 1 : 1,000, whereas most developing countries are lucky if they have one to every 5,000 farmers (p. 2).

The situation is made worse by other problems such as: poor roads, no telephones, poor postal services, low salaries of the FEWs, and others. In such situations the participatory approach must be implemented in a selective manner, that is the putting forth of efforts to attract the participation of a selected group of farmers who can influence the majority. In the Training and Visit Extension System such a selected group are the contact farmer group. If Rogers' (1971) theory

of diffusion of innovation is applied, these are the early adopters.

The FEWs and the contact farmers are the most crucial members of the development process at the village level (Benor, 1977; Shields, 1967). They can then choose group members, which consist of early adopter farmers, who have more abilities for developing heterophily types of interrelationship, more mobility, more enthusiasm, and other positive characteristics (Rogers, 1971). There is no question that these key farmers can be used to serve as "linkers" (a link between FEWs and all farmers) or those who can take some linking roles, that are usually played by the FEWs. It is almost impossible for a FEW, who is responsible for about 3,200 farmers, to work effectively unless he shares his linking roles with the selected contact farmers.

Lionberger (1982) listed 16 prominent linking roles for FEWs to carry out everywhere and these are: 1) information carrier, 2) friendly listener, 3) motivator, 4) process facilitator, 5) agency linker, 6) ability builder of people, 7) teacher of skills, 8) work helper, 9) program administrator, 10) group worker, 11) fence keeper, 12) promoter, 13) local leader, 14) counselor, 15) protector, and 16) institution builder. It is unusual in the developing countries for FEWs to share the linking roles with the researchers; it is more common to share the linking roles with contact farmers.

The linking process has two kinds of functions: "control" and "assistance" (Leonard and Marshall, 1983, p.



36). If a FEW shares his linking roles with the contact farmers, he can obtain more effective control because under the leadership of the contact farmers, farmer groups can develop better self-control. Through the sharing of the linking role assistance in terms of services, technical assistances, and personal assistances can be provided by the key farmers, and not by the FEWs only.

The Adoption of the Training & Visit Extension System in Indonesia

The Training & Visit (T & V) Extension System was introduced into Indonesia in 1977 under the sponsorship of the World Bank. The T & V Extension System originated in India which has many cultural traditions that are similar to those in Indonesia.; however Indonesia has applied the system more rigorously and systematically (Benor, 1977).

In adoption of the new system, the GOI did not abolish the previous systems. Rather, the Government integrated the new system into those already in place. One system, known by its popular name, BIMAS (Mass Guidance), still exists. Also, the package-program called "Panca-Usaha" is still being implemented. In fact, the purpose of introducing the T & V System into Indonesia was to strengthen the existing systems at the village level.

The integration of the T & V System into the older systems is in congruence with the T & V System, since it is not a comprehensive or exclusive one. Rather, it is one which

permits the obtaining of better working programs at the village level. Adams (1982, p. 78) feels that a "program of work" is the essence of the T & V System.

In the beginning, Indonesia selected nine provinces to adopt the T & V System as follows: West Java, Central Java, Daerah Istimewa Yogyakarta, East Java, South Sulawesi, South Kalimantan, North Sumatra, West Sumatra, and South Sumatra. It was expanded in 1978 to include five other provinces followed: Daerah Istimewa Aceh, Bali, West Nusa Tenggara, West Kalimantan, and Lampung.

The adoption of T & V System was followed by significant increases in rice production and many authorities feel that this resulted from the stronger organization of farmers into smaller groups and the disappearance of the "leveling-off" phenomenon in agricultural development throughout the country (Departemen Pertanian Republik Indonesia, 1979). However, Departmental leaders feel that there is still a need to develop the T & V System further. The development of the system to its maximal capacity has been given priority by the World Bank (Compton, date unknown) and the country has made modifications in order to make the system more acceptable to its people. However, the basic principles of the system are applied everywhere. All consider the T & V System as one which concentrates its services on training and visit at village level as an intensive effort to quickly reach large numbers of farmers with advice covering the entire production cycle (Benor, 1977). The system, by using one



command structure, is simpler, more unified, and more flexible than the old system, thus each country is able to concentrate its services more fully on agricultural extension. As indicated earlier, FEWs can concentrate their visits on selected key farmers and their direct attention on the most important crops. FEWs are well-trained as they are supported by senior extension officers (PPM) and subject matter specialists (PPS) and their training sessions are concentrated only on the most important subjects and skills that are timely in the production cycle. The schedules of work, duties, and responsibilities are clearly specified and closely supervised at all levels. The system has a built-in capacity for monitoring and self-evaluation so that it can be continuously modified and strengthened to meet the changing requirements of the farmers. The basic principles of the T & V System are being applied in Indonesia; therefore the application of the principles at the field level will be discussed briefly.

The basic principles of the T & V System were set out by the Central Basic Guidelines, the GOI's official standard for the implementation of the system in all provinces. However, some modifications of these Guidelines are permissible, at all provincial level. An evaluation study at the national level was done in 1981 by the National Food Crops Extension Project (NFCEP) in cooperation with the Faculty of Agriculture, Padjadjaran University, Bandung. This study indicated that adaptive modifications of the Central Basic

Guidelines were necessary because of size and difficult accessibility of the varying extension working areas. Also working facilities, funds, and transportation were limiting in many areas.

Modifications of the central basic guidelines were necessary not only for the technical-operational aspects but also with the methodology. The result of this study also indicated that inspite of many weaknesses, the T & V System has worked very well in Indonesia because of the good cooperation of extension agents with the village officials and local informal leaders, and especially of the dynamism of the farmer groups. Most of the Indonesian farmer groups took the spirit of "subak", "gotong-royong", and "mapalus" as their inner life. It is the way Indonesian farmer groups have been formed for years: by adapting the traditional socio-cultural associations to form groups for agricultural extension purposes (Sukaryo, 1983).

According to the above evaluation study, rice production had increased in some provinces outside Java (Riau, East-Kalimantan, and South-Sulawesi) and the factors making this possible were as follows: increase in the application level of "Panca-Usaha" programs, increase of the quantity and quality of the extension personnel, increase of the quantity and quality of the extension methodology, improvements in transportation facilities, improvements in the irrigation system, and improvements in other institutions concerned with supply of production inputs. The increases in



rice production in the three above provinces were not the result of the implementation of the T & V System but as the result of many other factors. It appears that the T & V System cannot cause increase in rice production unless it is supported by many external factors. Also, these factors must be integrated in a such way that they will be able to influence the operation of the T & V System at the field level.

Russell (1983) proposed a basic premise as follows:

To service large numbers of small farmers is costly --- rarely can any country afford the luxury of having more than 1 Village Extension Worker per 600-800 farmers --- and so to reach all farmers one has to work through a group approach, or at least with individuals in a defined group (p. 26).

The Russell premise would put the group approach as the "key" for the success of extension services in conditions that are found in the developing countries. The group approach is receiving a lot of attention in the adoption of the T & V System in Indonesia. More of the attention is usually put on the formation of farmer groups, the development of the farmer groups, and the selection of contact farmer leaders. Before a farmer group is formed in a village, farmers must first be divided into two strata: 1) upper stratum consisting of "petani maju" (the more progressive farmers who are considered responsive to new technology and willing to do more progress in their farming practices), and 2) lower stratum consisting of "petani biasa" or "follower farmers" (the more reluctant or nonadoptive farmers). In forming a farmer group both strata should be included so that lower-stratum farmers benefit from the upper-stratum

ones. Also, groups are formed on the basis of farmers' fields being close to others in the group. The contact farmer for each group should be selected by the members in a democratic way. FEWs expect farmer groups to develop abilities to plan program, to implement the planned program, to improve knowledge and skills of its members, and to develop an appropriate farm management system that maximizes profit.

The final purpose of organizing farmers into groups in Indonesia is to enable them to consider and make their own decision when dealing with problems related to the adoption of innovations (supply of high-yielding seeds, fertilizers, pesticides & insecticides, services for credits, pricing policy at the village market, etc.) as well as other problems (Departemen Pertanian Republik Indonesia, 1979). For this purpose, farmer groups are expected to be able to build a strong self-confidence and sense of independence among themselves.

The implementation of INSUS program (special intensification program) in Indonesia since 1979 followed the strategy of farmer grouping. Farmers were grouped by irrigation area units. Freedom was given to the INSUS groups to decide which of the technical inputs they would adopt for their particular conditions, and to plan and implement their own plans. Support services were given by extension agents working under the T & V System, by the village unit banks, by the village unit cooperatives, and by the kiosks, the delivery units at village level which cooperated closely with the



INSUS farmer groups. Teken and Herman Suwardi (1982) reported that the total rice production in 1980 jumped 13.3% above the 1979 production as the result of around 1.2 million hectares or 20% of the total area of intensification program being covered by the INSUS program.

Russell (1983) also presented another basic premise as follows:

The stronger the participation of beneficiaries in all aspects of a program --- from planning to evaluation, not just in implementation --- the more successful the program is likely to be (p. 26).

Russell wrote his two basic premises, one of which was mentioned earlier, in his comment to the Indonesian paper presented at the Asian Regional Workshop on the Training & Visit Systems of Extension held at Chiang Mai, Thailand, in late 1982. He found that Indonesia had implemented the two basic premises so far. He felt that in Indonesia participation of farmers in all aspects of program enhanced the "feedback" mechanism. Feedback from farmers on the planned and implemented programs was desired and asked by the PPL, PPM, and PPS usually through regular contacts with farmers. These officers involved farmers in choosing the topics and materials for visitation, making the mini-survey to collect suggested impact points from them, and in the seasonal evaluation programs.

Feedback from farmers affected the revision of topics of training and topics of visits for the next season. Diaries had been distributed to all PPL, PPM, and PPS in order to be

used for collecting any kinds of feedback from farmers including the new complaints and problems and bringing them to the weekly Rural Extension Center meetings for group discussions.

Some successful farmers known as "kontak tani andalan" (the reliable contact farmers) were chosen to be members in the technical committees which worked as coordinators for activities involving researchers, extension agents, and farmers. A technical committee was established at national, provincial, and district levels. In these sites, the successful farmers usually functioned as technical resources for PPLs, PPMs, and PPSs.

Summary

The Review of Literature was divided into four sections:

1. The General Participatory Approach.
2. The Benefits of Participatory Approach.
3. The Participatory Approach for Field Extension Workers.
4. The Adoption of Training and Visit Extension System in Indonesia.

The Participatory Approach as Developed in Agricultural Research & Development was defined as one in which the farmers participate in the decision-making process as regards use of modern technology and other inputs in their production system. By the use of diagrams, the operation of the



participatory approach was compared to the "vertical" and "horizontal" models representing those of Western Europe and the United States models. Also, the history of the development of the participatory approach, often called the Training and Visit system of extension, was discussed, pointing out the roles of the International Agencies in this development. Some authorities have referred to the participatory approach as the "interactive-knowledge creation-diffusion utilization" approach in which, the creation of new agricultural knowledge is the function of agricultural researchers, while the function of the extension agents is the diffusion of this knowledge to the farmers, who utilize it. However, in order for effective utilization to take place, there must be "interaction" among researchers, extension agents, and farmers. If the farmer's needs and views are considered, the researcher's works will match the farmer's real needs, and the extension agent will serve to communicate to the farmers the available technologies along with its input/output relations. This will permit the farmer an opportunity to use or reject the possible inputs. In turn the farmers can, and will, indicate the kinds of research needed in their farming systems. A distinct advantage of the participatory approach concerns the fact that both extension agents and research specialists are able to become more knowledgeable about the prevailing farming systems in use by the farmers whom they serve. The importance of implementing participatory approach selectively was discussed in relation

to the problems of millions of small farmers in the developing countries who need to be lifted up from their disadvantageous position.

The Benefits of the Participatory Approach appear to be many, as these would arise from the exploration of human resources, something that the participatory approach tries to do as far as possible. It is based upon the premise that people can be motivated to use their abilities to do what they want to do if the proper approach is used. In agriculture, changes resulting from an educational process that involves people from the very beginning offer to be more permanent. A target formulated by the farmers in terms of productivity offers greater potential of being achieved if those who work for this target are given an opportunity to discuss that target with their research and extension agents, and especially before the project is initiated. There are many benefits that can be expected from the implementation of the participatory approach in the fields of education, community development, management, and agricultural development. However, due to space limitations, few of them were discussed in this Review of Literature.

The Participatory Approach for Field Extension Workers was discussed in some detail pointing to experiences in Sri Lanka, Tanzania, and elsewhere, and to some of the difficulties in using any extension system, such as: shortage of extension personnel, poor roads, lack of telephones, low literacy level and others. The importance of using linking



roles by Field Extension Agents was discussed; sixteen linking roles were listed.

The Adoption of Training & Visit Extension System in Indonesia was discussed to some extent in order to highlight the need for solving the "leveling-off" process in rice production. The system appears to offer some prospects for improvement in the development of agriculture in Indonesia. Other discussions focused on the need for doing adaptive modifications on the Central Basic Guidelines due to the variations in conditions of agriculture and in the people found there. It appears that the strength of the modified Training & Visit System in Indonesia lies on the formation of farmer groups, by adapting the traditional sociocultural associations, and on the feedback mechanism developed in the relationship between farmers and PPL, PPM, and PPS. The importance of the implementation of INSUS program into the T & V System was discussed. The final purpose of the grouping strategy in the T & V System is to enable farmers to take care themselves especially in dealing with solving problems related to the adoption of innovations.



CHAPTER III

DESIGN AND METHODOLOGY

This chapter of the dissertation is used to describe the basic rationale of the study, its location, its design, the instrument used, the data collection procedure, and the methods used in the analysis of data.

Basic Rationale of the Study

This study is concentrated on the comparison of three groups of FEWs in their relative effectiveness in carrying out certain extension functions. The three groups were differentiated in terms of the degree to which they implemented the participatory approach and then experienced the benefits of this approach. These measurements offer to reveal the real effects of the participatory approach in bringing about agricultural changes that result in increased production of rice.

The participatory approach appears to raise some promising expectations as follows: more feedback from farmers, good information about the conditions of the farmers, and well designed extension programs which offer to be appropriate to the needs of farmers. As the future programs offer to become more decentralized, they will probably more

flexible, thereby providing greater possibilities for adjustment to various conditions of the fields and levels of local resources available. The system, as it matures, offers greater applicability for use in multiplecrop farming as well as mixed farming which involves animal agriculture. It appears that when farmers realize the FEWs can provide sound and practical information that was derived from research and experiment, there could be more interest in attending the regular meetings with the FEWs. When the system is in place, the production of rice and the "palawija" crops are expected to increase because the farmers themselves will become motivated to increase the production of these crops.

The Location of the Study

The Daerah Istimewa Yogyakarta (DIY) was chosen as the location of the study for several reasons: 1) it has a long experience in conducting agricultural development pilot projects based on which the Government of Indonesia (GOI) has developed its policies in agriculture, 2) it has very great educational influences, 3) its farmers are well trained and have higher educational background than most provinces, and 4) it is a small province in terms of size that was within the capacity of the researcher for conducting this study to cover.

This province has 3,185.80 Km² with a population of 2,884,667 in 1984 and divided into five districts called "kabupaten"s: Kotamadya Yogyakarta, Kabupaten Sleman,



Kabupaten Bantul, Kabupaten Kulon-Progo, and Kabupaten Gunung-Kidul. However, the Extension Services uses its own administration system in which the DIY is considered to be an Agricultural Development Region which in Indonesian is "Wilayah Pengembangan Pertanian" (WPP). Under the WPP there are 15 Extension Center Working Areas called in Indonesian "Wilayah Kerja Balai Penyuluhan Pertanian" (WKBPP). At the lowest level there are 3,884 Group Areas called in Indonesian "Wilayah Kelompok" (WILKEL).

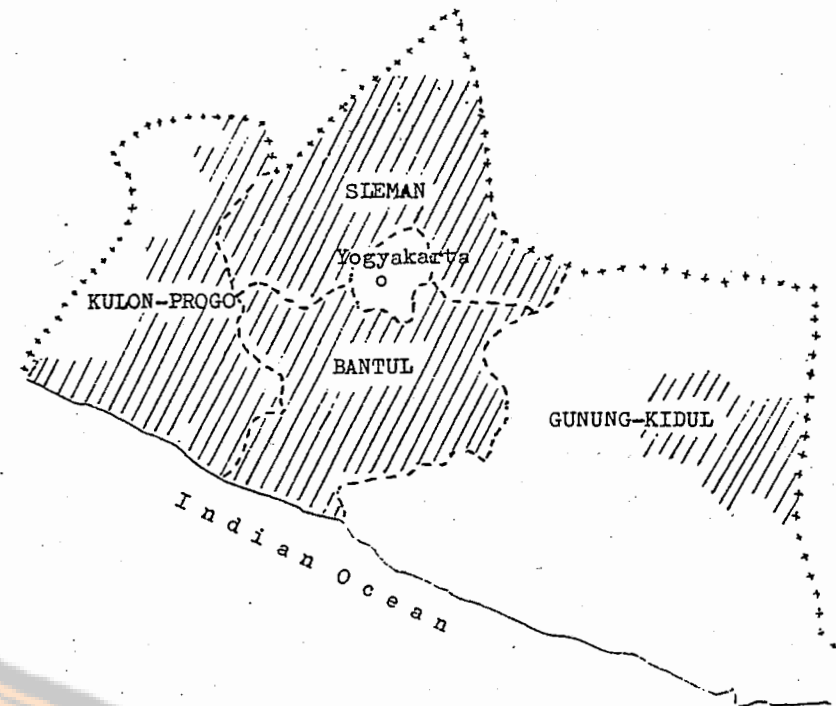
The types of land-use found in the DIY are wet field consisting of 63,384,96 Ha (19.90%), dry field consisting of 89,624.49 Ha (28.13%), back yard consisting of 83,756.22 Ha (26.29%), forest consisting of 16,830.00 Ha (5.28%), and others including the settlements consisting of 64,983.99 Ha (20.40%).

In 1980 there were 403,805 farm families including land-holders, land-tenants, and share-croppers. In terms of land-size they are divided into three categories: (1) 201,689 families (49.94%) covered farm units containing less than 0.25 Ha; (2) 98,653 families (24.43%) covered farm units containing between 0.25 Ha and 0.50 Ha; and (3) 103,463 families (25.63%) covered farm units containing more than 0.50 Ha.

The Provincial Agricultural Department's extension personnel consist of 2 Coordinators ("Kepala Bagian's), 12 Subject Matter Specialists (PPS), 38 Senior Agricultural Extension Officers (PPM), and 243 Field Extension Workers

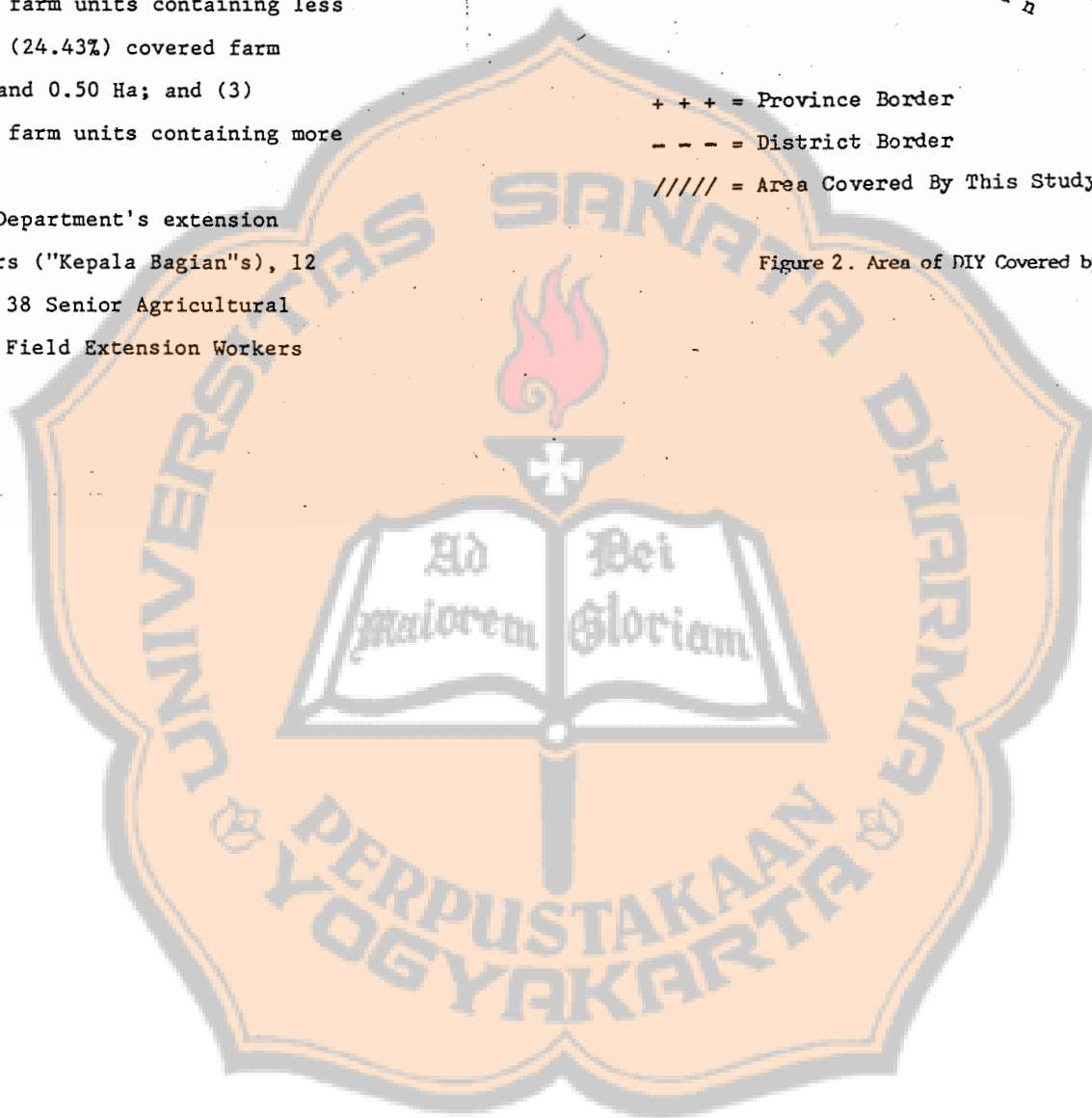
DAERAH ISTIMEWA YOGYAKARTA

Scale 1 : 375,000



+++ = Province Border
 --- = District Border
 ///// = Area Covered By This Study

Figure 2. Area of DIY Covered by this Study



(PPL). In 1984 there were about 4,270 contact farmers, 63,965 progressive farmers, and 467,266 follower farmers, that were involved in the extension programs. All were organized into farmer groups of which there were 12,539 farmer groups in 1984, and this represented an increase of 72.78% over 1983. There were about 2,627 farmer groups involved in the INSUS program.

Rice is the main crop and is planted in both wet and dry-rice fields. Other crops are secondary to rice and consist of corn, cassava, sorghum, ground-nut, soy-bean, sweet potatoes, and small-green pea. In Indonesian, these are called "palawija" crops. Vegetables such as pepper, cabbage, tomatoes, shallots or red onion, long bean, and others are becoming very important as food sources to farmers and these are planted especially at the upland areas. Sugar cane and tobacco are two other commonly planted commodities in this province. Rice, palawija, and vegetables are planted in the "intensification" as well as "non intensification" areas. For the 1983/1984 planting season there were 10,219 Ha rice, 128,535 Ha "palawija", and 4,544 Ha vegetable, while in 1984 planting season there were 58,969 Ha rice, 40,710 Ha "palawija", and 5,925 Ha vegetables in the intensification system. The level of production of rice crop can be seen at Appendix B.

The area of Daerah Istimewa Yogyakarta covered by this study is shown as the "lined area" in Figure 2. The reason

for restricting this area concerns the fact that the GOI rice intensification programs has been carried out here since 1960's; therefore, the farming system and the extension programs were well-developed, and the farmers have been involved in the programs. It was felt that this area would be more appropriate for this study than the rest of the province.

Design of the Study

A case study research approach was chosen because it appeared to be quite appropriate for exploratory studies that involve various kinds of data.

This study was carried out through three different stages: the first dealt with the classification of the FEWs into three groups, the second dealt with the exploration of special characteristics of the individual groups, while the third dealt with the evaluation of the working accomplishment of each group.

1. Classification of FEWs

The FEWs were classified into three social units for analysis purpose. It involved 142 FEWs who were evaluated concerning the extent they implemented the participatory approach (Variable A) and experienced the benefits of such an approach (Variable B). The investigation was administered in a form of "self-assessment" test and the instrument used will be discussed later in this section.



The main reason of using two variables instead of one as criteria for classification was an attempt to optimize the results, and especially since the classification was based upon rankings. It is felt that the FEWs that were ranked as the lowest by using two criteria would better represent the bottom group than if so ranked by using one criterion. By the same reasoning, the FEWs ranked as the highest by using two criteria would be more representative than if only one criterion was used. The other reason to use one more variable, which is Variable B, was an attempt to control the unexpected high scoring of Variable B done by FEWs who implemented participatory approach not as a result of their "self-discovery" learning processes but as a result of other processes such as: implementing participatory approach based on an "boss-oriented" mentality, lack of seriousness in doing the self-scoring, expecting a reward by high self-scoring, etc.

The three groups resulted from the above classification were then referred to as the Lower, Middle, and Upper-Group. For the classification, a ranking procedure was implemented using the "percentile rank" to determine the group for each FEW. The Lower-Group consists of those FEWs with average scores below the thirty-third percentile at Variable A and Variable B scores. The Middle-Group consists of those FEWs with average scores between the 33rd and 67th percentile, while the Upper-Group consists of FEWs with average scores above the 67th percentile (See Figure 3). Afterwards, three

sample groups, each of which consists of 12 FEWs, were chosen using a "purposive sampling" technique; its purposiveness refers to the representativeness for the whole province.

FEW	Variable A.			Variable B.			Group
	Percentile Rank			Percentile Rank			
	33th	33-67 th	67th	33th	33-67 th	67th	
1	x				x		-
2	x			x			Lower
3		x		x			-
4		x				x	-
5		x			x		Middle
6	x					x	-
7			x		x		-
8			x			x	Upper
9			x	x			-
n							

Figure 3. Classification of FEWs into Three Groups

Variable A and B are considered to be closely associated. Questionnaires used to test both variables in the first test were repeated later in a "one-month-test-retest" procedure that involved 14 FEWs outside the 142 mentioned above. A "Spearman Rank Correlation Coefficient" test was used to test the degree of the association and



reliability. Results of this test are interpreted to indicate that Variable A and B are closely associated with each other and that both tests were reliable.

2. Exploration of Group Characteristics

Then, the second stage of the investigation was carried out in order to explore the special characteristics of each group, and the four characteristics chosen were as follows: 1) familiarity of FEWs with farming life of their farmers and families, 2) FEW residence closeness to working area and his knowledge about it, 3) capabilities of FEWs to develop farmer groups, and 4) personal perceptions of FEWs about the supporting agencies.

3. Evaluation of Working Accomplishment

The third stage of investigation, which was considered as the main investigation, dealt with a test of the degree that the three groups differed in their working accomplishments. Four contact farmer leaders were chosen for independent evaluation of each FEW within the three groups. The accomplishments of the FEWs were the following seven extension targets: 1) The appropriateness of FEW recommendations for farmer use (Variable C), 2) numbers of adopter farmers in the farmer groups (Variable D), 3) the ability of FEW to readily identify farmer problems (Variable E), 4) the ability of the FEW to solve farmer problems (Variable F), 5) the abilities of farmer groups to work as group (Variable G),

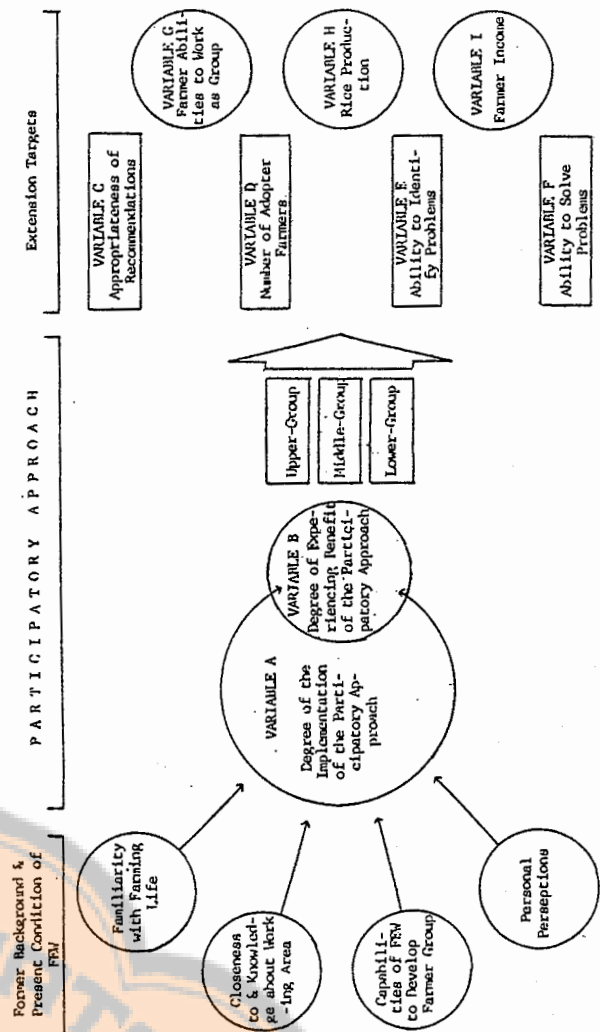


Figure 4. Interrelationship among Variables Analyzed in this Study

6) quantitative rice productions (Variable H), and 7) rice farmer incomes (Variable I). Differences were tested for statistical significance by using three tests: 1) the Kruskal-Wallis H Statistic Test, 2) the Kruskal-Wallis Formula Test, and 3) the Post-Hoc Multiple Comparisons Test. These three statistical tests, which are non parametric tests, were considered to be the most appropriate ones to use in the analysis. It was assumed that the seven variables (Variable : C, D, E, F, G, H, and I) have underlying continuous distributions and that are drawn from the same population (Siegel, 1956). Before being tested for significance the score data were changed into ordered or rank data.

Figure 4 (see the previous page) exhibits the interrelationship of the variables in this study. Variable A & B were treated as the independent variables and were tested for possible association. Variable C, D, E, F, G, H, and I were treated as the dependent variables.

Instruments

The "instruments" used herein were the three questionnaires which were used in the collection of data through three different stages as follows: 1) the questionnaire for classification, 2) the questionnaire for exploration, and 3) the questionnaire for evaluation; all were designed to be structured questionnaires and used a combination of multiple choice and essay questions.

A "self-assessment" questionnaire for use by FEWs for measuring Variable A and B in the first stage of investigation was designed in the form of a "five-options-rating scale" as follows: 1 = Never, 2 = Seldom, 3 = Occasionally, 4 = Often, and 5 = Always; it was similar to the Likert-type rating scale. Twenty four items were used for studying Variable A and these were the twenty four principles of the participatory approach that were developed for use in the Training & Visit Extension System. Then sixteen items were used for studying Variable B, and these are referred to as the sixteen benefits that can be expected from the implementation of the participatory approach within the T & V Extension System (See Appendix A, Form 1). Respondents were the 142 FEWs, the entire population of FEWs involved in this study.

Also, a "self-assessment" questionnaire, involving twenty two-questions was used to explore the special characteristics of each sample group in the second investigation. It was a multiple-choice questionnaire that requested the best fitting answer of the respondent's own situation, or they could write a complete answer (See Appendix A, Form 2).

Then, in the third study an "evaluation" questionnaire was used involving contact farmer leaders. Four contact farmer leaders were chosen for an evaluation of the accomplishment of each FEW sample by the use of a "five-options-rating scale" that was similar to the Likert-type rating scale. The contact-farmer-leaders rated the FEWs on how well



they carried out the principles of the T & V Extension System.

Beside the collection of the primary data by using the three above questionnaires, the researcher collected secondary data from the local village administration offices by use of a special form that was designed for this purpose. This form is commonly used by the Social Economic Department of the Agricultural Faculty, Gadjah Mada University, Yogyakarta, for directing the two-week supervised experience program for students.

Data Collection Procedure

The data were collected in three consecutive stages, each of which used a different questionnaire that involved a different group of respondents. Stage 1, the classification study, had to be first, and it was followed by the exploration study (stage 2). Stage 3 was the evaluation study. Because of limited time, stage 2 and 3 were conducted at the same time, because the chosen FEW samples were fixed when the studies were carried out and two different groups of respondents involved could be handled simultaneously. The procedure is shown in Figure 5.

The distribution of the three questionnaires to the respondents was done by the researcher who was assisted by the AEOs at the RECs and three co-assistants from the Social Economic Department of the Agricultural Faculty, Gadjah Mada University.

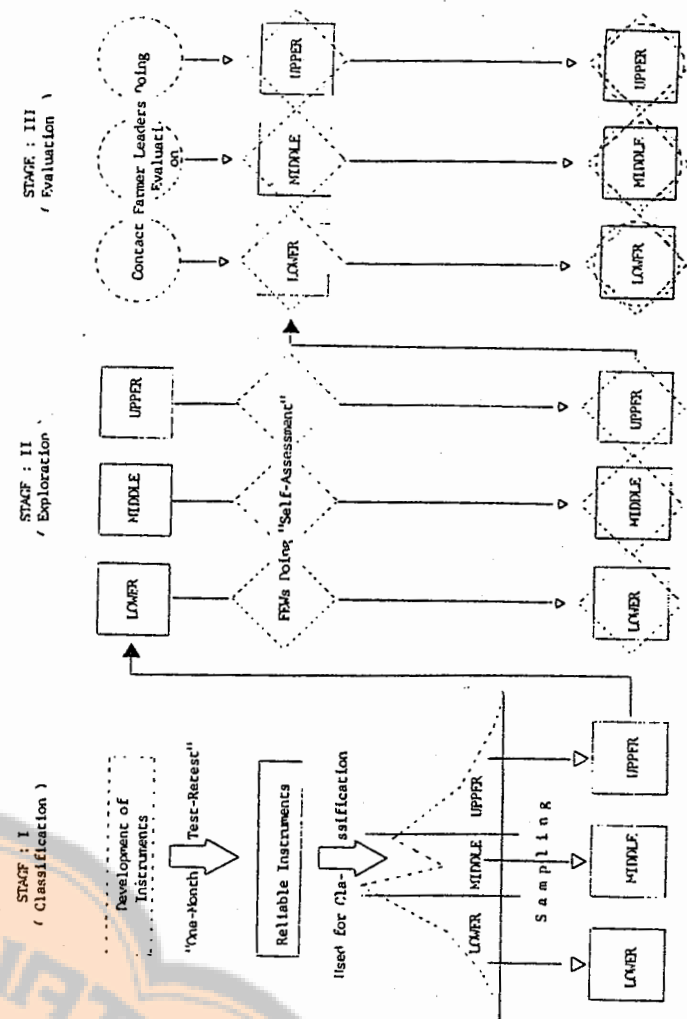


Figure 5. Data Collection Procedure

Analysis of the Data

Analysis of the data were carried out for possible correlations between age, period of working as FEWs and period of stay at the present WKPPs, and the degree to which the FEWs implemented the participatory approach, by using Pearson Product-Moment-Correlation Coefficient test. This analysis employed all data collected from the 142 FEWs in the DIY.

A Spearman Rank Correlation Coefficient Test was implemented to test the degree of association and reliability of Variable A and B.

Analysis of data collected under objective 4 was done by using a Kruskal-Wallis H Statistic test. It is called a "One-Way-Analysis of Variance by Ranks", a non parametric type of test (Marascuilo & Mc Sweeney, 1977; Linton & Gallo, 1975; and Siegel, 1956). The analysis used the following formula:

$$H = \frac{12}{N(N+1)} \sum_{j=1}^k \frac{R_j^2}{n_j} - 3(N+1) \frac{C}{N}$$

where H = Value for the test statistic for the ranks
 k = Number of samples
 N = Number of cases in all samples combined.
 R_j = Sum of ranks in jth sample (column)
 n_j = Directs one to sum over the k samples (column)

C = Correction factor for the tied values

$$= 1 - \frac{1}{N - N} \sum_{s=1}^d (t_s^3 - t_s) , \text{ where } t_s \text{ de-}$$

notes the number of observations tied at rank S.

Having the observed value of H equal to or larger than the critical value of Chi Square at degree of freedom (df) = k - 1 , and level of significance (α) = 0.05 which was = 5.99 for this study was used to determine the possible rejection of null hypothesis.

In case there were significant differences two additional analyses were conducted: 1) the Post-Hoc Multiple Comparison Test in order to find the precise location of the significant differences among the three possible pairwise contrasts (L-M; L-U; M-U), and 2) the Kruskal-Wallis η^2 Formula Test in order to determine the strength of association between variables being analyzed.

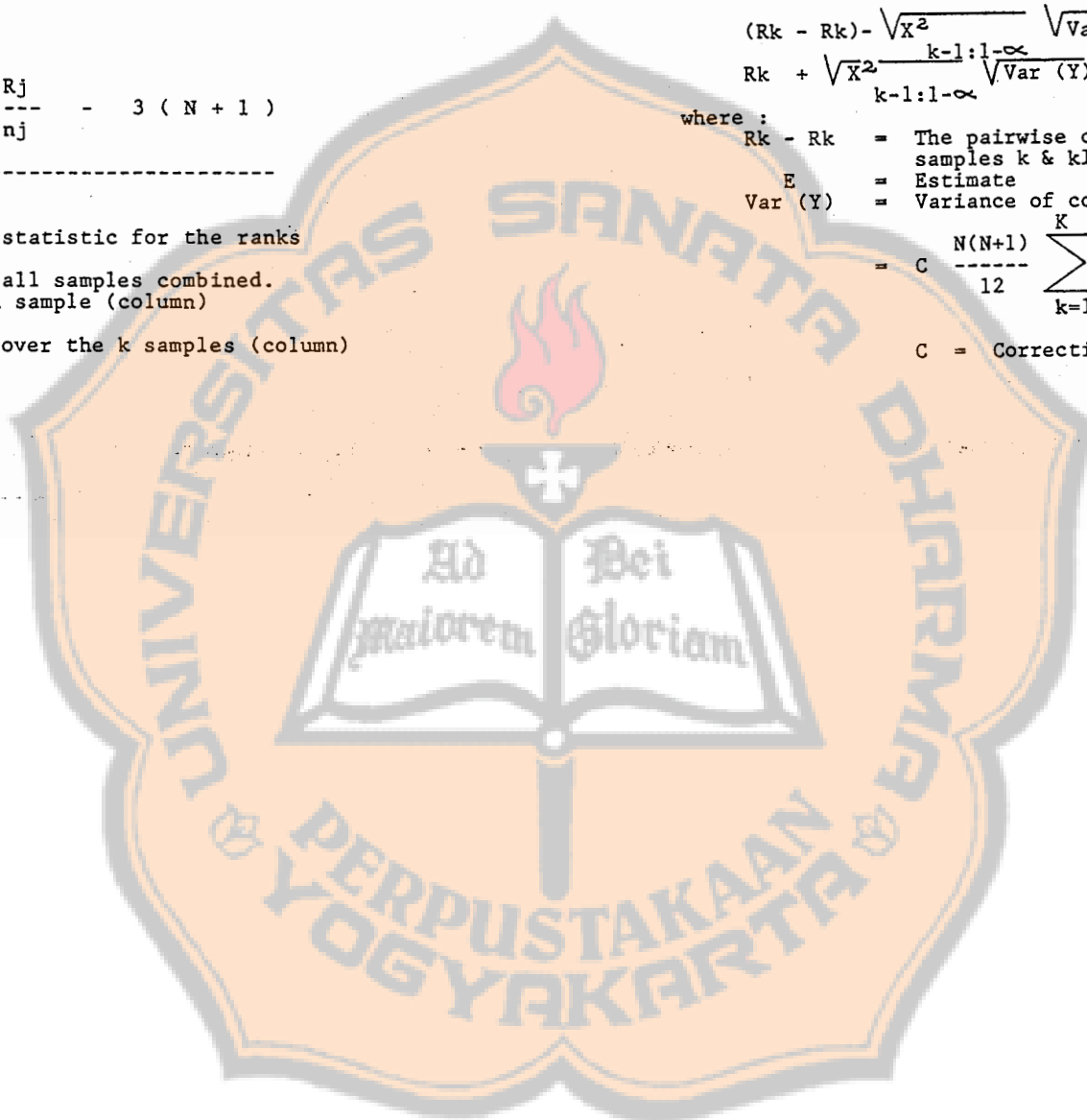
The Post-Hoc Multiple Comparison Test uses formula as follows:

$$\frac{(R_k - R_{k'}) - \sqrt{\frac{X^2}{k-1:1-\alpha}} \sqrt{\text{Var}(Y)}}{\sqrt{\frac{X^2}{k-1:1-\alpha}} \sqrt{\text{Var}(Y)}} < E(R_k) - E(R_{k'}) < \frac{(R_k - R_{k'}) + \sqrt{\frac{X^2}{k-1:1-\alpha}} \sqrt{\text{Var}(Y)}}{\sqrt{\frac{X^2}{k-1:1-\alpha}} \sqrt{\text{Var}(Y)}}$$

where :
 R_k - R_{k'} = The pairwise contrast in the mean ranks of samples k & k'
 E = Estimate
 Var (Y) = Variance of contrast

$$= C \frac{N(N+1)}{12} \sum_{k=1}^K \frac{a_k^2}{n_k}$$

C = Correction factor for tied values.



$\chi^2_{k-1;1-\alpha}$ = The critical value of Chi Square at
df = (k-1) and level of significance = α

The Kruskal-Wallis η^2 Formula Test uses formula as follows:

where:

$$H = \frac{12}{N(N+1)} \sum_{j=1}^k n_j(\bar{r}_j - \bar{r})^2$$

H = Strength of association
 N = Value of the test statistic for the ranks
 N = Number of cases in all samples combined.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

The purposes of this chapter are to present an evaluation of the instrument used in this study and to describe the characteristics and accomplishments of the three groups of FEWs as evaluated by their contact farmer leaders. The evaluation of the instrument is presented in the first section while in the second section are presented the levels that the FEWs implemented the participatory approach and experienced the benefits of the implementation. The third section is used to describe the characteristics of the population of FEWs from which the three main groups were chosen, while the fourth presents a description of the characteristics of FEWs in the three chosen groups. The fifth section presents the accomplishment of the three groups in dealing with seven extension targets. The fifth section presents a summary of the major finding analyses done by this study.

Evaluation of the Instruments

The reliabilities of the individual instruments were tested by using "one-month test-retest" procedure.



implemented to 14 FEWs outside the 142 FEWs that were used in this study. This procedure was used also to determine the degree of association between Variable A and B.

The first test was administered from 20th to 25th July 1985 while the second followed 1 month later. The 14 FEWs used in the test worked in Kabupaten Gunung Kidul, which is located outside of the areas covered in the overall study. The paired scores, which were taken from the two tests, were analyzed by using Spearman Rank Coefficient Correlation Test which determines the correlation coefficients between the test scores. A r-value of 0.74 was obtained when the 24 items measuring the implementation of the participatory approach were tested and it was statistically significant. A r-value of 0.53, obtained when the 16 items which measured the experience of the benefits were tested; this value, also, was significant. Therefore there was a significant correlation between scores obtained in the first and second tests, thereby indicating that the instruments for studying Variable A and B were reliable.

A strong association between Variable A and B was indicated also through this one-month test-retest procedure. The scores of both variables taken from the first and second tests were analyzed by using Spearman Rank Correlation Coefficient Test. A r-value of 0.65 was obtained in the first while a r-value of 0.83 was obtained from the second test conducted one month later. Since both r-values were

highly significant, these indicate that Variable A and B are strongly associated.

The Degree of the Implementation of the Participatory Approach

Twenty four items were used for testing the degrees of implementation of the participatory approach by the FEWs while 16 items were used to measure the degree of experiencing the benefits of the approach. All items were rated by the 142 FEWs and these represented 97.3% of the 146 FEWs that were expected to participate in this study, four were unable to complete the rating because they were out of town when the researcher came to distribute the questionnaires.

Table I shows the distribution of scores among the 24 items that measure the degree of implementation of the participatory approach by the 142 FEWs. The average score indicates the extent that these 142 FEWs implemented the 24 principles of the participatory approach in the T & V Extension System in the DIY Province.

No item had a score below 2.50, the upper limit of "seldom", and above 4.50, the lower limit of "always"; therefore, it appears that, on the average, the 24 principles were implemented "occasionally" to "often". The average score for the 24 principles was 3.67, indicating "often". The lowest score was 2.82 for principle number 6



TABLE I
COMPARISONS OF EXTENT OF IMPLEMENTATION OF
THE PARTICIPATORY APPROACH BY 142 FEWS

Selected Principles of Participatory Approach as Developed within the T & V Extension System.	The Extent of Implementation (Average Score)
1. Involving farmers in the process of planning & developing extension activities at farmer group level.	3.47
2. Encouraging farmer group to choose their own leader.	3.98
3. Letting farmer group determine themselves whether they will accept or refuse recommendations given from outside.	3.59
4. Allowing farmer group to modify recommendations as needed.	2.97
5. Involving contact farmers in choosing topics & materials for visitation meetings.	3.32
6. Involving farmers, outside contact farmer group, in choosing topics & materials for visitation meetings.	2.82
7. Utilizing knowledge of progressive farmer group in collecting materials used to develop better programs.	3.46
8. Utilizing failure experiences of farmer groups in collecting materials to be used to develop better programs.	3.45
9. Utilizing success experiences of farmer groups in collecting materials to be used to develop better programs.	3.87
10. Conducting a mini survey of social & economic life of farmer group early in the program.	3.34
11. Encouraging regular feedback from contact farmer leaders.	3.96

TABLE I (Continued)

12. Encouraging regular feedback from contact farmers outside the leader group.	3.49
13. Encouraging regular feedback from progressive farmers within the groups.	3.55
14. Encouraging regular feedback from follower farmers within the groups.	3.29
15. Encouraging farmer group to identify their own problems.	3.51
16. Encouraging farmer group to discuss and solve their own problems.	3.67
17. Allowing farmer group to seek information assistance outside Government's network.	3.65
18. Encouraging farmer groups to use their own initiatives in solving problems.	3.76
19. Helping farmer group members to build courage to be able to express their own opinions.	4.37
20. Avoiding "dictating" to the farmers in providing recommendations.	4.10
21. Using more "dialog" in providing extension to farmers.	4.13
22. Channeling the interests of farmers by involving them in program planning in order to obtain more involvement in the execution of the program.	4.05
23. Channeling the farmer complaints to those who have competency to give the right answers.	4.14
24. Helping farmer groups establish a self-confidence and a sense of independence.	4.19
Average	3.67



(Involving farmers outside contact farmer group in choosing topics & materials for visitation meetings), while the highest score was 4.37 for principle number 19 (Helping farmer groups build courage to express their own opinions). In fact, it appears that all principles that deal with learning activities (number 1, 5, and 6), FEW recommendations (number 3 and 4), and program development (number 7, 8, 9, and 10) had lower scores compared to scores for those principles that deal with "teaching methods" (number 19, 20, 21, and 24) and "channelling farmer interests and complaints" (number 22 and 23). The higher scores obtained in the principles that dealt with "teaching method" or "communication technique" such as: the building of courage; the avoidance of dictating; encouraging the use of more dialog; and the establishing of more self-confidence and sense of independence in farmers, and the channeling of farmers' interests and complaints indicate that the FEWs had good training in these areas.

To principles dealing with the encouraging of farmers to identify and solve their own problems (number 15 and 16), allowing farmers to seek information and assistances elsewhere (number 17), and encouraging farmers to use their own initiative (number 18), the FEWs gave relatively lower scores when compared to those dealing with teaching methods.

The distribution of scores of the 16 items that measured the extent that the 142 FEWs experienced the

benefits of implementing the participatory approach are shown in Table II.

TABLE II
COMPARISONS OF EXTENT OF BENEFIT THAT 142
FEWS EXPERIENCED IN IMPLEMENTING THE
PARTICIPATORY APPROACH

Benefits of Implementing the Participatory Approach.	The Extent of Experience (Average Score)
1. Farmer group is able to select recommendations which are appropriate for adoption.	3.24
2. Adoption by members of farmer group becomes more compact and in togetherness.	3.50
3. Sense of responsibility increases among the farmer group members.	3.58
4. Sense of self-confidence within the group increases when they face new problems.	3.65
5. Sense of belonging among the group members increases.	3.56
6. Materials presented during visitation meetings become more fitting to the needs of farmers.	3.77
7. Materials presented during visitation meetings become easier to understand.	3.83
8. Presentations become more attractive to farmers.	3.68
9. Creativeness within the farmer group increases.	3.63
10. Relationship & cooperation among group's members improve continuously.	3.72
11. Adoption of "Panca-Usaha" programs by group members becomes more complete.	3.46



TABLE II (Continued)

12. Various kinds of skill and ability owned by group members can be more utilized.	3.51
13. Farmers become more willing to attend regular meetings.	3.34
14. Interest of farmers for agricultural innovations increases.	3.47
15. Farmers can see more alternative solutions of their problems.	3.65
16. More problems can be solved by the farmers themselves.	3.42
A v e r a g e	3.56

Compared to scores which measured the implementation of the participatory approach, the scores in Table II were lower in terms of average score and shorter in terms of range; scores in Table II ranged from 3.24 to 3.83 while scores in Table I range from 2.82 to 4.37.

In Table II the lowest score was obtained in number 1 (Farmer group is able to select recommendations which are appropriate to adoption), while the highest score was obtained in number 7 (Materials presented during visitation meetings become easier to understand). These findings indicate that the better teaching method used by the FEWs or their improved communication techniques stimulated the use of dialog, the avoidance of dictating, thereby helping farmers to build self-confidence, and that they improved the

easeness by which materials were understood by the farmers. Better teachings method also had an effect on the fact that materials became more fitting to the needs of farmers (number 6), and that FEW presentations became more attractive (number 8).

It is interesting to note that benefit number 13 (Farmers become more willing to attend regular meeting) appeared to have a relatively lower score. In fact, regularity of attending meetings for farmers depends greatly on whether the FEWs can come regularly. Other data indicate that only a few of the FEWs were regular in attending farmer meetings because of several reasons: the distance of FEW residence from the working area, the extensiveness of the working area, the excessive number of farmers who need to be served, and transportation problems.

General Characteristics of the Field
Extension Workers Working in the
Daerah Istimewa Yogyakarta.

Data collected from the 142 FEWs dealt with age, period of working as FEWs, and working period at the present WKPPs. Most FEWs had finished Vocational Agricultural School (SPMA) seven years ago or less. Their average age was 27.65 year, with an age range of 22 to 45 year. There were 121 men and 22 women, and their working experiences as FEWs ranged from 2 to 14 years with an average of 6.7 years. Seven had working experiences of more than 10 years. The periods of



working at the present WKPPs ranged from 1 to 13 years; only four had been in their present WKPPs position for more than 8 years.

FEWs working in the DIY as well as in all of Indonesia area are relatively young, less than 35 year old with average working experience of less than 10 years; the one who was 45 year old as well as those with experiences of more than 10 years are exceptions. Figure 6 shows the ages of the 142 FEWs in a graphic form. The increasing line in Figure 6 is smooth and is everincreasing, while the decreasing line is less smooth and goes down slowly.

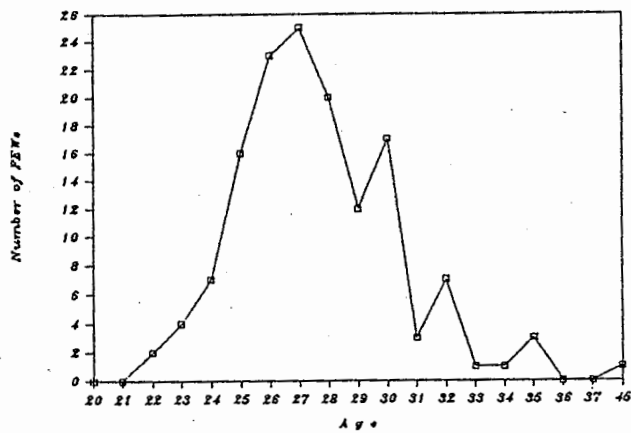


Figure 6. Ages of the 142 FEWs Working in the Daerah Istimewa Yogyakarta

These lines indicate the path of the FEW careers: Transfers of FEWs to the higher positions and to other areas of responsibility are not as smooth as is the entering of the FEWs to the present positions. This is to be expected of an expanding system.

Figure 7 shows the period of working experiences and the length of stay at the present WKPPs for the 142 FEWs. The decreasing lines of both figures go down very drastically from 7 to 9 years then down slowly from 9 to

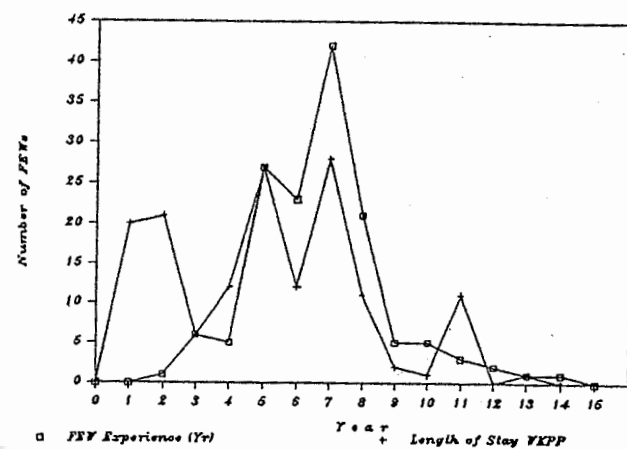


Figure 7. The Period of Working Experience and the Period of Staying at the Present WKPPs of the 142 FEWs

14 years, indicating that the 8th year is the critical one for the FEWs in regards to being moved to other positions or to other areas of responsibilities.

Age, length of working experience, and period of stay at the present WKPP showed no relationship to the extent the FEWs implemented the participatory approach, as the Pearson r-Correlation Analysis indicated no significant correlation in these parameters.

As mentioned earlier, the 142 FEWs were classified into three groups based on the extent they implemented the participatory approach and to the extent that they obtained positive benefits of such an approach. The data are shown at Figure 8 and 9, while the procedure was shown already by Figure 3 in the section instrument.

Firstly, scores that measured the extent that FEWs implemented the participatory approach were presented in the form of a score distribution. Then the whole area of distribution was divided equally into three sub-areas called Lower, Middle, and Upper area. When the percentile rank of score was considered, it is clear that the Lower area was below the 33rd percentile, the Middle area between the 33rd and 67th percentile, and the Upper area was above the 67th percentile. Scores which measured the benefits of participatory approach had a similar profile.

Since the classification of the FEWs was based on two combined criteria, not all 142 FEWs could be classified into the three groups. Therefore, only those who met the both criteria were used to obtain Lower, Middle, and Upper-Groups. As a result, only 88 FEWs (61.54%) met the classification criteria, thereby giving 29 FEWs in the

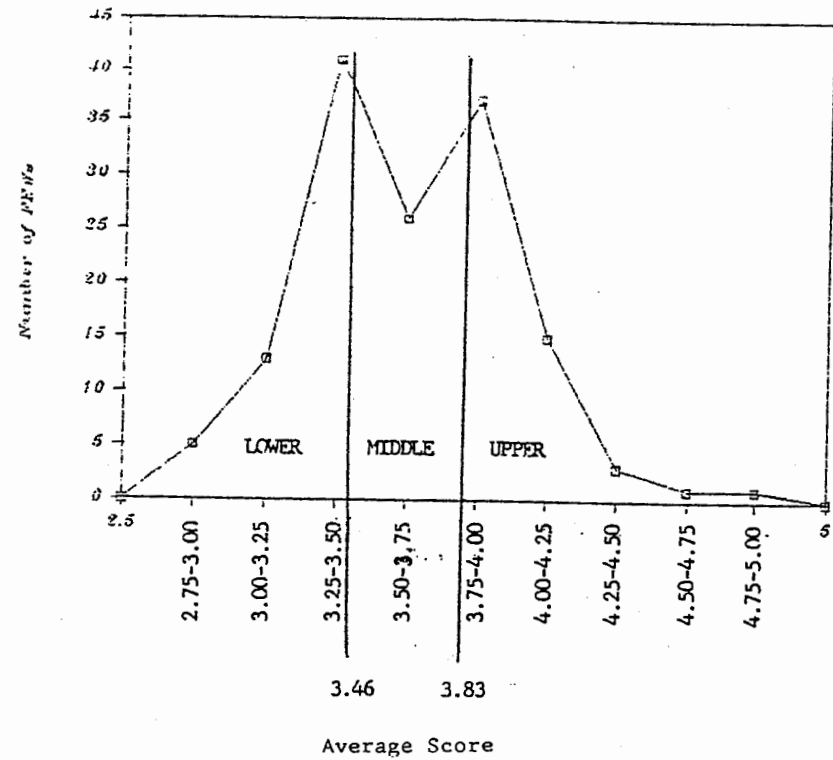


Figure 8. The Division of 142 FEWs into Three Groups Based on the Extent that They Implemented the Participatory Approach



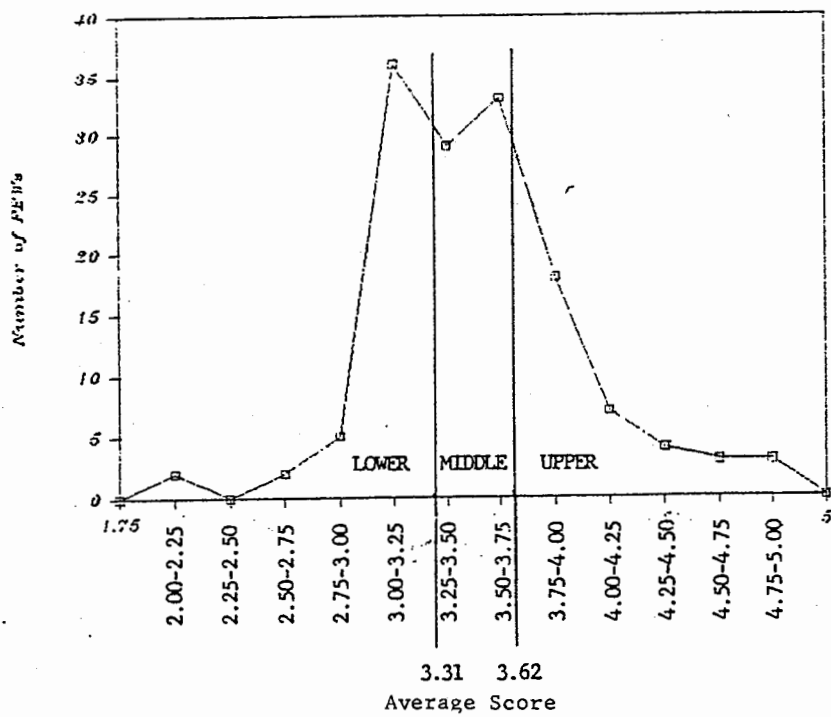


Figure 9. The Division of 142 FEWs into Three Groups Based on the Extent that They Experienced the Benefits of Implementing the Participatory Approach

Lower-Group, 28 in the Middle-Group, and 31 in the Upper-Group. Then, these ratings were discussed by the researcher with the AEOs at the RECs. It is conforiting to note that the results of the rating did not differ from the general perceptions of the AEOs regarding the relative performances of their FEWs.

Specific Characteristics of the Three Groups

The sample groups were selected by using a purposive sampling technique with purposiveness being based upon two considerations: 1) the representativeness to the various rice farming conditions in the DIY and 2) the acceptability of the rating results when compared to the general perceptions of the AEOs at RECs. The AEO perceptions were based upon four times a year evaluations which involved both FEWs and contact farmers.

To strengthen the representativeness of the various rice farming conditions in the province, the numbers of samples were increased from 10 FEWs as proposed in the original Project Proposal to 12 for each group, thereby providing 36 FEWs for the samples. One of the 36 FEWs was dropped when it was discovered that his WKPP had only a small amount of rice field, less than 50 Ha. Therefore, the composition of the three sample groups were respectively 12, 11, and 12 FEWs in the Lower, Middle, and Upper-Group.



Four districts in the DIY were represented proportionally due to the number of FEWs in each district: Kabupaten Sleman had 14 FEWs (40.0%), Kabupaten Bantul by 12 FEWs (34.3%), and Kabupaten Kulon Progo by 7 FEWs (20.0%). Kabupaten Gunung-Kidul was represented by only 2 FEW (5.7%) of total samples. In general, these represent the irrigated rice-growing areas.

Tables III shows how the 35 FEW samples were selected from FEWs who met criteria for classification and how they were distributed among the four districts.

TABLE III
NUMBER OF FEWS WHO MET CRITERIA FOR CLASSIFICATION AND SELECTED AS SAMPLES FOR REPRESENTING THE DIY

Group	Number of FEWs Who Met Criteria for Classification.	Number of FEWs Selected as Samples for the DIY	Distribution among Districts.			
			Kab. Sle-man.	Kab. Ban-tul.	Kab. Kl. Progo.	Kab. Gn.Ki-dul.
Lower-Group	29	12	4	4	4	0
Middle-Group	28	11	6	4	0	1
Upper-Group	31	12	4	4	3	1
T o t a l	88	35	14	12	7	2

The size of sample group, which is about 40% of the

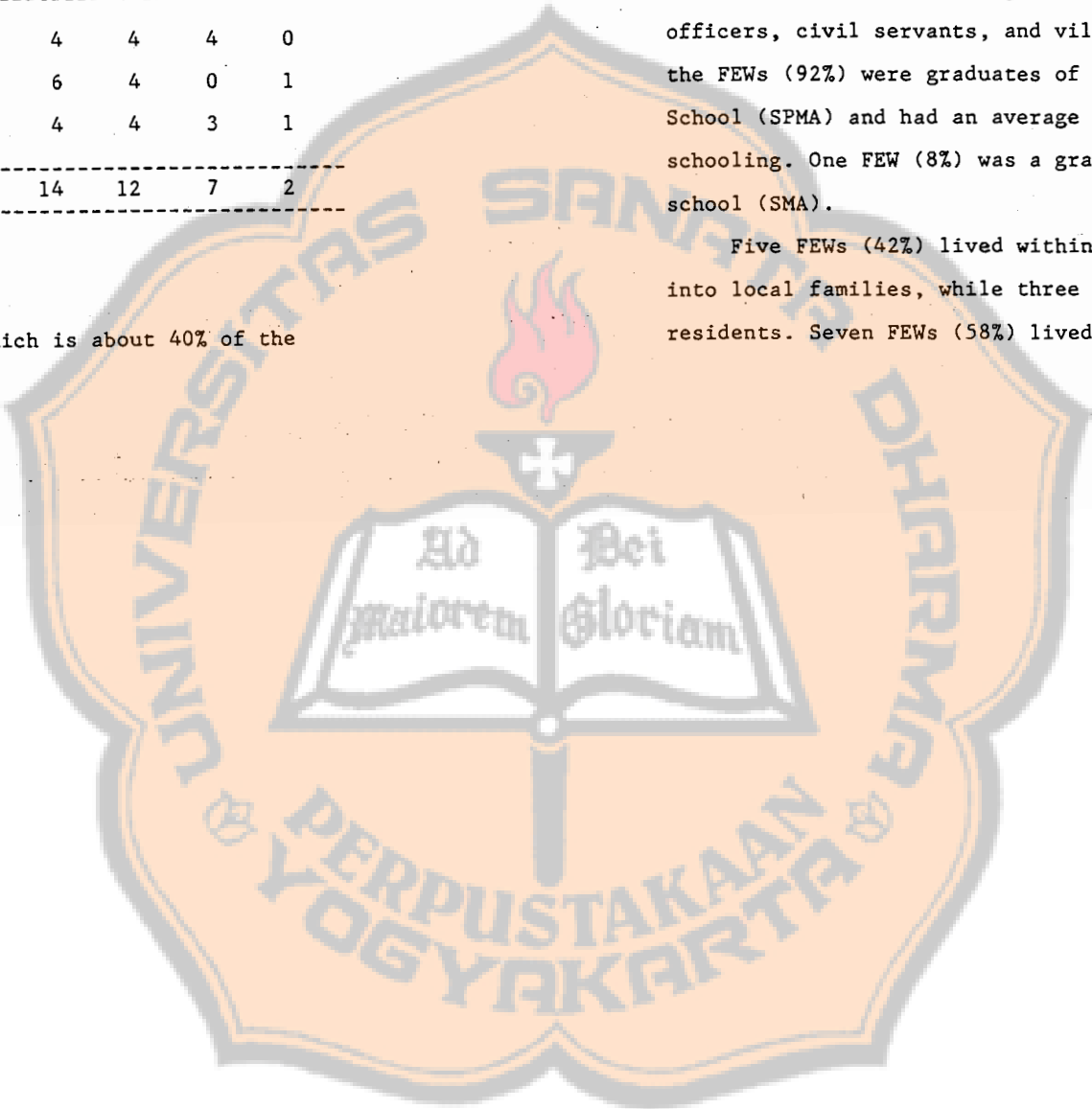
total FEWs which met criteria for classification, or about 25% of total FEWs involved in this study, may be too large to function as a sample group. However, there are so many advantages of larger sample group that it was chosen. These advantages are: 1) larger groups better represent the total population, 2) statistical analysis will be stronger, and 3) the purpose of doing a case study will be met better. The disadvantages are: 1) it takes more effort and time for data collection, and 3) it is more expensive.

The following subsections are used to describe the individual groups within the three sample groups. Data were collected on each FEW by using a "self-assessment" test.

Lower-Group

The Lower-Group FEWs on the average were 28.9 year of age, had worked as FEW for 7.3 years, and had been at the present WKPPs for 4.4 years. Four (33%) came from a farmer family background, three (25%) from farm labor families, and five (42%) from non farming families, such as: military officers, civil servants, and village officials. Eleven of the FEWs (92%) were graduates of the Vocational Agricultural School (SPMA) and had an average of 12.82 years of total schooling. One FEW (8%) was a graduate of a general high school (SMA).

Five FEWs (42%) lived within the WKPPs, two had married into local families, while three were temporary non residents. Seven FEWs (58%) lived outside the WKPPs, two of



which lived about 30 Km away, while the five others lived about 12 Km away.

Ten FEWs (83%) owned their motorcycles and used these for their transportation needs, while the other two (17%) had bicycles for transportation.

Four FEWs (33%) had secondary jobs, of which two were in farming operations, while the other two worked outside farming. Most of the group (67%) did not have secondary jobs. Reasons for secondary jobs concerned the need for additional incomes.

The FEWs served an average of 33 farmer and activity groups (16 "KTDH", 3 "Klompén", 1 "Klompér", 3 "KTW", 2 "KPT", 4 "OPPA", and 4 "RPH" groups) at each WKPP. Communications with these farmer and activity groups were perceived as being smooth by three FEWs (25%), somewhat smooth by seven (58%), unsmooth by one FEW (8%), and very unsmooth by one FEW (8%). Attendance of regular meetings of the farmer groups was in the range of 25% to 50% of members by 6 FEWs (50%), while the other six (50%) reported an attendance of less than 25%.

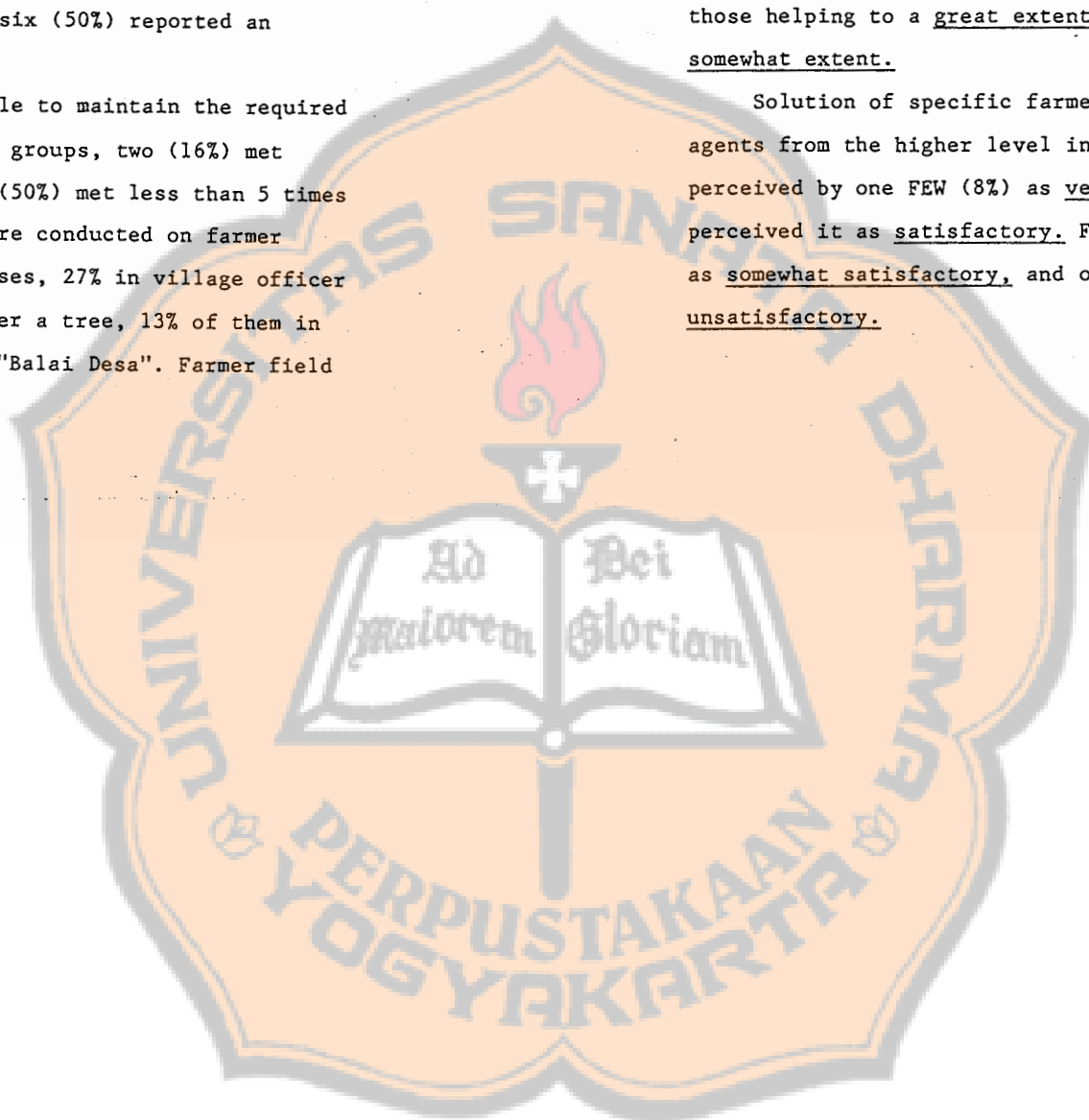
Only four FEWs (33%) were able to maintain the required 32 meetings per month with farmer groups, two (16%) met around 20 times a month, and six (50%) met less than 5 times a month. About 27% of meetings were conducted on farmer fields, 27% in contact farmer houses, 27% in village officer houses or in farmer houses or under a tree, 13% of them in the "Gubug Pertemuan", and 6% in "Balai Desa". Farmer field

was felt by six FEWs (50%) to be the most desirable place for meeting with farmer groups, primarily because the materials used were always be practical thereby permitting farmers to relate the problems under discussion to their own fields. Two FEWs (17%) chose the Gubug Pertemuan, and for the same reasons. Two FEWs (17%) chose the Balai Desa because of good local support by village officers. Two FEWs (17%) chose contact farmer homes as the most desirable places because it was easier to bring farmers together here.

Eight FEWs (67%) felt that they knew their WKPPs to a great extent for dealing with natural conditions, people conditions, agricultural economics, and cropping systems used by the local farmers, while four (33%) felt they knew those matters only to a somewhat extent.

One FEW (8%) felt that the training sessions given at the RECs helped to a very great extent in regards their efforts toward personal improvement of farmers and the handling of their complaints and problems, ten (84%) felt those helping to a great extent, while one (8%) chose the somewhat extent.

Solution of specific farmer problems by extension agents from the higher level in extension organization was perceived by one FEW (8%) as very satisfactory, six (50%) perceived it as satisfactory. Four FEWs (34%) perceived it as somewhat satisfactory, and one (8%) perceived it as unsatisfactory.



The local village officers were perceived by one FEW (8%) as being supportive of the extension activities to a very great extent, five (42%) perceived to a great extent, and six (50%) perceived them to a somewhat extent.

Middle-Group

FEWs in this group had an average age of 30.1 years, working experience as FEW of 7.7 years, and period of stay at the present WKPPs of 5.1 years. Seven FEWs (64%) came from farmer-family background, and one (9%) from a non-farming family background. Nine FEWs (82%) were graduates of the Vocational Agricultural School (SPMA), and required an average of 12.22 years to finish all schooling. Two FEWs (18%) were graduates of a general high school (SMA), while two (18%) others had studied at the university level for an average of 7.5 years.

Six FEWs (54%) lived within the WKPPs, one of which had married into a local family, while five others were non residents of their WKPPs. Five FEWs (46%) lived outside the WKPPs, three of which lived more than 10 Km away, while the other two lived in about 5 Km away from the WKPPs.

Eight FEWs (73%) owned their motorcycles that were used for their transportation needs, while three (26%) used bicycles.

In regards to secondary jobs, four FEWs (36%) did some farming, while the rest (64%) did not have secondary jobs.

Those having secondary jobs expected to earn additional incomes (2 FEWs) while one helped a friend in his business.

FEWs from this group served an average of 37 farmer and activity groups (16 KTDH, 2 Klompen, 1 Klompir, 4 KTW, 1 KPT, 6 OPPA, and 6 RPH groups) at each WKPP. Communications with farmer groups were perceived as being smooth by most of the FEWs (82%) and somewhat smooth by the rest (18%). Four FEWs (36%) reported that regular meetings with farmer groups were attended by 50% to 75% of the members, three (28%) reported an attendance of 25% to 50%, and four (36%) reported an attendance of less than 25% of the members.

There were wide variations in the frequency of meetings of the FEWs of this group with the farmer groups and this appears to be unusual. One FEW (9%) reported that he met with farmer groups about 80 times a month, one (9%) met about 60 times a month, while one other (9%) met farmer groups about 50 times a month. These reports appear to be more reasonable for individual meetings with any farmers than meetings with farmer groups. Seven FEWs (64%) reported that they met farmer groups less than 10 times a month, while another FEW (9%) reported that he met with farmer groups about 23 times a month. About 53% of the meetings were held on farmer fields, and this was reported by five FEWs (45%) to be the most desirable places for group meetings because these would be more practical permitting the farmers to relate the discussed problems to their own, and three (27%) preferred the Gubug-Pertemuan because of the



farmer-family backgrounds. One (8%) was from a farm labor family background, while three (25%) came from non farming family backgrounds: civil servant, retailer, and small bussiness. All were graduates of the Vocational Agricultural School (SPMA) and their total years to finish their entire schooling was an average of 12.17 years. One had studied at the University level for 3 years.

Five FEWs (42%) lived within their WKPPs; two were married to local people, while three others resided there temporarily. Seven (58%) lived outside of their WKPPs; five lived about 3 Km away while two lived about 13 Km away.

Motorcycles were transportation mode; ten FEWs (83%) owned their motorcycles while two (17%) borrowed these.

Five FEWs (42%) performed in secondary jobs and reported farming as this job. The remainder (58%) did not have secondary jobs. Those who held secondary jobs performed these for additional income (2 FEWs), while others (3 FEWs) desired to gain further farming practical experiences.

FEWs from this group had an average of 55 farmer and activity groups (16 KTDH, 7 Klompen, 3 Klompir, 6 KTW, 5 KPT, 7 OPPIA, and 9 RPH groups) at each WKPP. Communications with farmer groups were perceived as being very smooth by one FEW (8%), smooth by most (67%), and sowewhat smooth by three (25%).

In regards to attendance of regular meetings, seven FEWs (58%) reported that 50-75% of their farmers attended,

some reason. Two FEWs (18%) preferred meeting in contact farmer houses, because their farmers preferred this. One FEW (9%) had no preference because his farmers would meet anywhere as long as there were no restrictions.

Ten FEWs (91%) felt that they knew their WKPPs to a great extent when dealing with the natural conditions, people conditions, local agricultural economics and cropping systems. One FEW (9%) felt that he knew his WKPP in dealing with the matters mentioned above only to a somewhat extent.

Five FEWs (45%) reported that the training sessions given at the RECs helped to them to a very great extent for solving problems dealing with personal improvement, in the handling of farmer complaints, and other problems. Six FEWs (55%) reported that these training sessions helped to a great extent. Solution of specific farmer problems by extension agents from the higher level in their organization was perceived by five FEWs (45%) as satisfactory, while six others (55%) perceived this as somewhat satisfactory. The local village officers were perceived by two FEWs (18%) as being supportive to a very great extent of the extension activities, four (36%) to a great extent, and the rest (46%) only to a somewhat extent.

Upper-Group

FEWs in this group had an average age of 28.0 years, working experience as FEW of 7.0 years, and period of stay at the present WKPP of 5.8 years. Most (67%) came from



three (25%) between 25 and 50%, one (8%) over 75% and one (8%) less than 25%.

Eight FEWs (67%) were able to maintain the required frequency of meetings with farmer groups of 32 per month, one (8%) was able to meet only 14 times a month, and three (25%) were able to meet only about 5 times a month. About 34% of the meetings were conducted at the houses of contact farmers, 30% in Gubug-Pertemuan, 22% of them in the farmer fields, and 14% in other places, such as the Pak Dukuh's houses, and Balai Desa. The Gubug Pertemuan was claimed by eight FEWs (67%) as the most desirable places for meetings as these meetings could be very practical, cheap, informal, and close to farmer fields, which permitted the farmers to understand the problems in the field. Two FEWs (17%) pointed out that the farmer fields are the most desirable places for meetings because farmer can better see and understand the problems there. Two other FEWs (17%) preferred to meet with farmer groups at the house of contact farmers because their farmers preferred this.

Two FEWs (17%) reported that they knew their WKPPs to a very great extent when dealing with the natural conditions of the area, the condition of people, agricultural economics, and the cropping systems of the local farmers, another eight (66%) reported a value of to a great extent, while two (17%) reported a score of to a somewhat extent.

Ten FEWs (84%) reported that trainings given at RECs helped to a very great extent in making personal

improvements and in handling farmer complaints and problems, while one (8%) said that those trainings helped to a great extent, and another (8%) said that those trainings helped only to a somewhat extent. The solution of specific problems by extension agents from the higher level was perceived by three FEWs (24%) as very satisfactory, while four (34%) perceived it as satisfactory. Four (34%) perceived it as somewhat satisfactory and one (8%) perceived it as unsatisfactory. Local village officers were perceived by five FEWs (42%) as being supportive of the extension activities to a very great extent, four (33%) to a great extent, two (17%) to a somewhat extent, and one (8%) to a small extent.

The Relative Accomplishments of the Three Groups of FEWs as Perceived by Their Contact Farmer Leaders.

The following sub-sections present the results of the evaluations made by the contact farmer leaders concerning the performances of their FEWs in meeting each extension target. In addition, the collection of secondary data on rice production is added at the appropriate subsection.



1. Variable C: The Appropriateness of the FEW Recommendations Concerning "Panca-Usaha" and Two Additional Programs

The "Panca-Usaha" program is known in Indonesia as a type of "appropriate technology-package program", and consists of five-farm principles: 1) the use of high-yielding varieties, 2) water-management in accord with the water requirement of the crops concerned, 3) proper fertilizing by right methods and rates, 4) the carrying-out of proper control methods for pests and diseases, and 5) the carrying-out of appropriate cropping techniques.

The Panca-Usaha program was initiated nationally in 1960s and the number of farmers adopting this program increased quite rapidly. There appears to be no reason to doubt that the contact farmer leaders appointed to do the evaluation of Panca-Usaha program really know this program.

Two programs added to the Panca-Usaha are the programs of the "Pola-Tanam" (Cropping Pattern) and "Pasca-Panen" (Post-Harvest). These are relatively new as compared to the regular Panca-Usaha program. It was assumed that all contact farmer leaders know these two programs well because they have been for some years the major ones of the GOI and have received much local publicity.

Appropriateness in this study was measured by using a "five-options rating scale" (1 = Very Inappropriate, 2 = Inappropriate, 3 = Somewhat Appropriate, 4 = Appropriate, 5 = Very Appropriate) similar to the Likert-type rating scale.

The appropriateness values of FEW recommendations concerning the above three programs are presented in Table IV as mean scores calculated from each sample group. Comparisons of the three groups were made by the use of the Kruskal-Wallis H Statistic Test. A post-hoc comparison test was done by using the Post-Hoc Multiple Comparison Test, but only when differences were significant, and this was followed by the strength of association test using Kruskal-Wallis Formula Test.

In general the recommendations of the FEWs in all groups tended to be perceived as highly appropriate by the contact farmer leaders. Scores ranged from 3.37 (= Somewhat Appropriate) to 4.58 (= Very Appropriate).

Overall the recommendations of FEWs from the Upper-Group were perceived as being more appropriate than those from FEWs in the two other groups. The Post-Hoc Pairwise test indicated that the Upper-Group differed significantly from not only the Lower-Group but also from the Middle-Group, when average scores were considered. In turn, the recommendations of FEWs of the Middle-Group were perceived as being more appropriate than those of the FEWs in the Lower-Group.

When the seven areas of recommendation were considered, five of these (71%) exhibited significant differences among the three groups, while the differences concerning the two other areas were not significant. It is evident that the differences were caused by the wide contrasts between the



TABLE IV

THE APPROPRIATENESS OF FEW RECOMMENDATIONS CONCERNING PANCA-USAHA AND TWO ADDITIONAL PROGRAMS WHEN COMPARED AMONG THE THREE GROUPS

Program	Mean Score for Group:			Statistic Test		
	LOWER n=12	MIDDLE n=11	UPPER n=12	Df.T H	Post-Hoc (L-M)(L-U)(M-U)	S.A n
<u>Panca-Usaha</u>						
1.High Yield Variety Use.	3.94	4.23	4.58	Sig	*	.35
2.Water Management.	3.37	3.93	4.04	Sig	*	.22
3.Fertilizing Method.	3.98	4.11	4.33	N.S		
4.Pest & Disease Control.	3.92	4.04	4.46	Sig	*	.21
5.Cropping Technique.	3.81	4.09	4.33	Sig	*	.25
<u>Additional</u>						
6.Pola-Tanam.	4.06	4.20	4.42	N.S		
7.Pasca-Panen.	3.46	3.95	4.33	Sig	*	.31
Average	3.79	4.08	4.35	Sig	*	.42

Sig = Significant.
N.S = Non Significant.
* = There is a significant contrast.
Df.T = Difference Test.
H = Kruskal-Wallis H Statistical Test.
L-M = Contrast between Lower-Group and Middle-Group.
L-U = Contrast between Lower-Group and Upper-Group.
M-U = Contrast between Middle-Group and Upper-Group.
S.A = Strength of Association.

Lower and Upper-Groups as shown by the results of the Post-Hoc Pairwise test.

The strength of association values ranged from 0.22 to 0.42 for the six parameters exhibiting significant differences, indicating that 22 to 42% of the variance in the ranks of appropriateness of recommendations, as perceived by contact farmer leaders, may be attributed to the degree that the FEWs implemented the participatory approach.

There appears to be no statistical method that could be used to determine the strength of association among the values. Linton and Gallo (1975) reported that a value of more than 0.10 is considered to be better than that found in the vast majority of studies. Therefore, the values of 0.22 to 0.42 are considered to be high and strong.

2. Variable D: Number of Farmers Who Adopted the Recommended Practices

It was decided to use score data instead of nominal data in order to measure the number of farmers who adopted the recommended practices. The main reason concerns the fact that the contact farmers have become more familiar with an evaluation method which uses a scoring system similar to that one which is conducted by the AEOs every season in order to check adoption rates of each innovation by the farmers. Also that evaluation system always involves both FEWs and contact farmers.



A "five-options-rating scale" was used to measure the percentage of farmers making the adoption of Panca-Usaha, Pola-Tanam, and Pasca-Panen programs; 1 = 1-20% of farmers making the adoption, 2 = 21-40%, 3 = 41-60%, 4 = 61-80%, and 5 = 81-100% of farmers. Again, contact farmers were asked for their perception of the number of farmers adopting the programs found in their WILKEL areas, and only farmers who adopted the programs according to the recommendations were included in the measurement.

The results of the measurements are presented at Table V, and the statistical analyses used were discussed previously.

The contact farmers perceived that the number of farmers who adopted the recommended practices was high; scores ranged from 2.93 (= 41-60%) to 4.46 (= 61-80%). The Pola-Tanam and Pasca-Panen programs, eventhough are relatively new, have also been adopted quite readily by the farmers.

When all seven parts of the programs were considered, the mean score of the Upper-Group was always the highest, followed by that of the Middle-Group, and in the last position was the Lower-Group. In a comparison among the three groups, it was found that in five parts of the programs, the differences were significant statistically. These were: Water-Management, Pests & Diseases Control, Cropping Techniques, Pola-Tanam, and Pasca-Panen. Differences were not significant among the three groups when

TABLE V
NUMBER OF FARMERS ADOPTING THE RECOMMENDED PRACTICES (PANCA-USAHA, POLA-TANAM, AND PASCA-PANEN) AS PERCEIVED BY CONTACT FARMER LEADERS

Program	Mean Score for Group:			Statistic Test			
	LOWER n=12	MIDDLE n=11	UPPER n=12	Df.T H	Post-Hoc (L-M)(L-U)(M-U)	S.A n	
<u>Panca-Usaha</u>							
1.High Yield Variety Use.	3.89	4.09	4.37	N.S			
2.Water Ma-management.	3.27	3.91	4.04	Sig			.18
3.Fertilizing Method	3.85	3.98	4.29	N.S			
4.Pest & Di-sease Control.	3.50	3.84	4.29	Sig	*		.30
5.Cropping Techniques.	3.35	3.77	4.39	Sig	*	*	.34
<u>Additional</u>							
6.Pola-Tanam.	3.27	3.63	4.46	Sig	*	*	.41
7.Pasca-Panen.	2.93	3.41	4.00	Sig	*		.26
Average	3.44	3.80	4.26	Sig	*	*	.32

Sig = Significant.
N.S = Non Significant.
* = There is a significant contrast.
H = Kruskal-Wallis H Statistic Test.
Df.T = Difference Test.
L-M = Contrast between Lower-Group and Middle-Group.
L-U = Contrast between Lower-Group and Upper-Group.
M-U = Contrast between Middle-Group and Upper-Group.
S.A = Strength of Association.



the other programs were considered.

The Post-Hoc Pairwise test indicates that the causes of differences came from the L-U and M-U contrasts and not from the L-M contrast, thereby indicating that, when there was a significant difference based upon the Kruskal-Wallis H Statistic test, it does not necessary indicate that the significant difference will also appear in the Post-Hoc Pairwise test as shown in the case of the Water-Management program (Table V). A possible explanation concerns the fact that the Post-Hoc Pairwise test, as used in this study is a Scheffe type of Multiple Comparison test known to be strong in avoiding Type I Errors, i.e., the possibility of asserting that a difference exists when no such difference exists. Used in any experiments, the Scheffe method always reveals the smallest number of significant differences as compared to the Duncan method which reveals the largest number. Between the two methods there are two others considered as moderate, the Tukey and Newman-Keuls methods (Ferguson, 1981).

3. Variable E: The Ability of the FEW to Readily Identify Farmer Problems

The abilities of the FEW to readily identify farmer problems were determined in terms of perceptions of contact farmers of time consumed for the identification. The measurement employed a five-option-rating scale: 1 = Very

Slowly, 2 = Slowly, 3 = Normal, 4 = Quickly, and 5 = Very Quickly. The problems selected were only those that are related to the farmer realization of Panca-Usaha, Pola-Tanam, and Pasca-Panen programs, as follows: 1) Any New Explosion of Pests and Diseases, 2) Farmer Complaints, 3) Economic Problems within the Farmer Households, 4) Technological Problems, 5) Drought, Flood, and Erosion Problems, 6) Lack of Necessary Knowledge and Skills in Farmers, 7) Internal Problems in Farmer Groups, 8) Production Constraints due to the Local Customs, and 9) Post-Harvest Problems.

The statistical analyses employed in this study were described earlier. The findings and the results of analyses were presented in Table VI.

The perceptions of contact farmers regarding the relative abilities of their FEWs to readily identify farmer problems are high as the scores ranged from 3.17 (= Normal) to 4.42 (= Quickly). The Upper-Group obtained the highest score in each comparison while the Middle-Group was in the second place and the Lower-Group was in the last place.

There were significant differences among the performances of the three groups of FEW when six problem areas were considered as follows: 1) Any New Explosion of Pests & Diseases, 2) Farmer Complaints, 3) Farmer Lack of Necessary Knowledge & Skills, 4) Internal Problems in Farmer Group, 5) Constraints due to Local Farmer Custom, and 6) Post-Harvest Problems. Two of these differences resulted



TABLE IV
PERCEPTIONS OF THE ABILITY OF FEWS TO READI-
LY IDENTIFY FARMER PROBLEMS

Farmer Problems	Mean Score for Group:			Statistic Test				S.A
	LOWER n=12	MIDDLE n=11	UPPER n=12	Df.T	Post-Hoc			
				H	(L-M)	(L-U)	(M-U)	n
1.Any New Explo- sion of Pests & Diseases.	3.81	4.07	4.42	Sig		*	*	.33
2.Farmer Com- plaints.	3.50	3.84	4.14	Sig		*		.37
3.Farmer House- hold Economic Problems.	3.48	3.70	3.92	N.S				
4.Technological Problems.	3.69	3.79	3.94	N.S				
5.Drought, Flood, and Erosion.	3.56	3.68	3.81	N.S				
6.Farmer Lack of Necessary Knowledge & Skills.	3.35	3.98	4.10	Sig		*	*	.54
7.Farmer Group Internal Problems.	3.60	3.82	4.06	Sig		*	*	.26
8.Constraints due to Local Custom.	3.42	3.63	3.92	Sig		*		.25
9.Post-Harvest Problems.	3.17	3.59	3.98	Sig		*		.42
Average	3.51	3.79	4.03	Sig		*		.44

significant difference was found also at the comparison of average mean score among the three groups as a result of the significant contrast of L-U.

About 25% to 54% of variances in the ranks of ability to readily identify these six problem areas could possibly be attributed to the degree that the FEWs implemented the participatory approach.

4. Variable F: The Ability of the FEW to
Solve Farmer Problems

The nine problems that were put forth under Variable E are used once more in order to deal with perceptions of the relative abilities of the FEW groups to solve them. In this study, both of the activities, the identifiycation and solving of farmer problems, are sequential steps that can be separated for analysis.

The relative abilities of the FEW to solve farmer problems was measured in terms of the degree of success in making the solution as perceived by the contact farmers, and the measurement used a five-option type of rating scale: 1 = Very Unsuccessful, 2 = Unsuccessful, 3 = Somewhat Successful, 4 = Successful, and 5 = Very Successful.

Statistical analyses followed the previous ones and their results appear in Table VII.

The perceptions of contact farmers regarding the abilities of their FEWs to solve farmer problems are



TABLE VII
THE ABILITY OF FEWS TO SOLVE FARMER PROBLEMS
AS PERCEIVED BY CONTACT FARMER LEADERS

Farmer Problems	Mean Score for Group:			Statistic Test		
	LOWER n=12	MIDDLE n=11	UPPER n=12	Df.T	Post-Hoc	S.A
				H	(L-M)(L-U)(M-U)	n
1.Any New Explo- sion of Pests & Diseases.	3.73	3.79	4.17	Sig	*	* .46
2.Farmer Complaints.	3.77	3.84	4.14	Sig	*	.22
3.Farmer House- hold Economic Problems.	3.44	3.77	3.83	N.S		
4.Technologi- cal Problems.	3.46	3.88	4.17	Sig	*	.51
5.Drought,Flood, and Erosion.	3.31	3.77	3.98	Sig	*	.38
6.Lack of Nece- ssary Know- ledge & Skills in Farmers.	3.56	3.82	4.21	Sig	*	.37
7.Farmer Group Internal Problems.	3.50	3.86	4.08	Sig	*	.51
8.Constraints due to Local Custom.	3.25	3.68	3.85	Sig	*	.32
9.Post-Harvest Problems.	3.50	3.73	4.00	Sig	*	.27
Average	3.50	3.79	4.05	Sig	*	.47

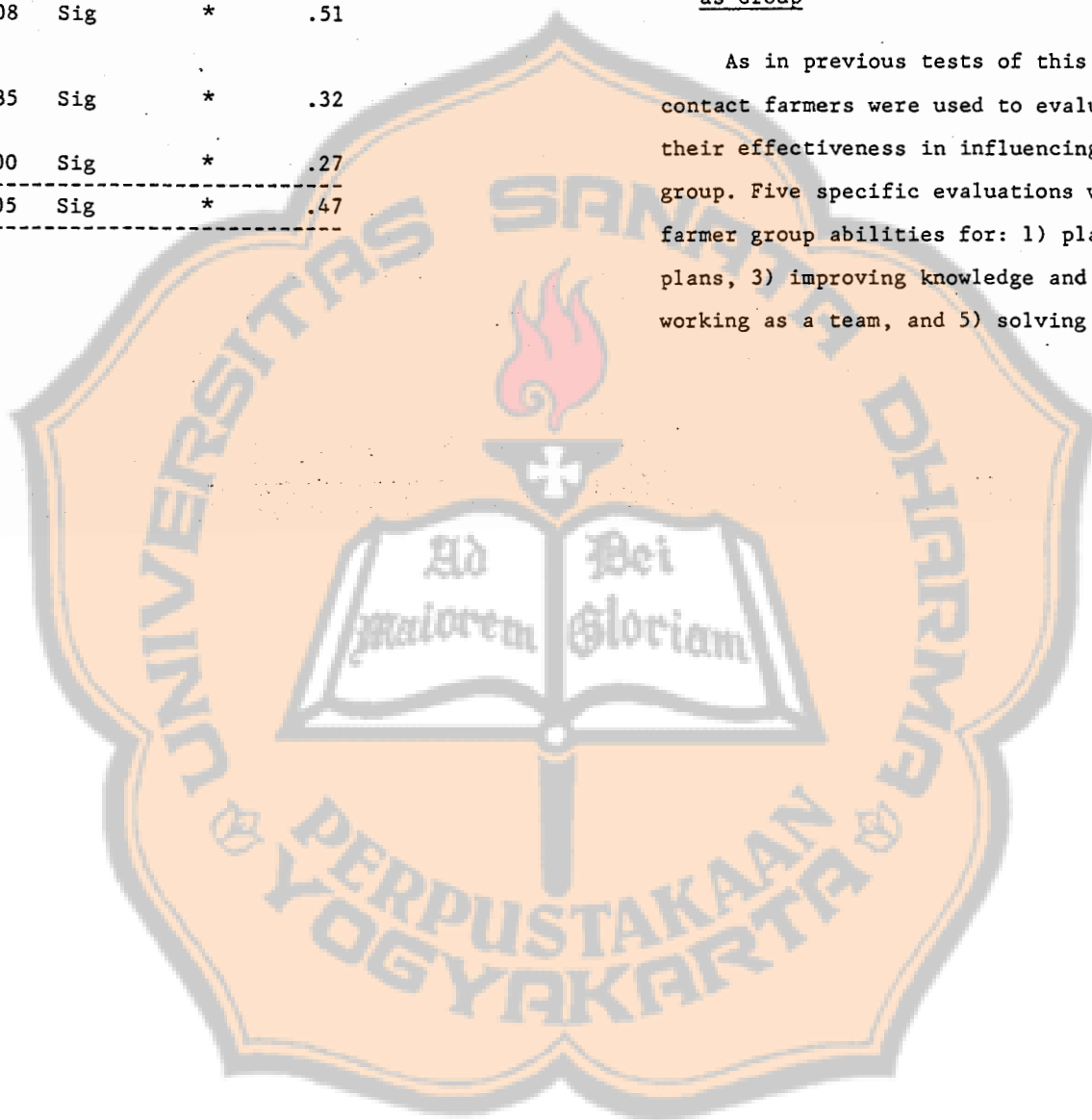
considered to be high, as scores ranged from 3.25 (= Somewhat Successful) to 4.21 (= Successful). The Upper-Group obtained the highest scores for all nine comparisons, followed by the Middle-Group, with the Lower-Group taking the last place.

There were significant differences among groups for all problems except one (Farmer Household Economic Problems). However, these differences appeared to be unbalanced because seven resulted from only the L-U significant contrasts, while one resulted from the L-U as well as the M-U significant contrasts.

Strength-of-association for all differences ranged from 0.22 to 0.51 indicating that 22% to 51% of variances in the ranks of the abilities of FEWS to solve the problems could possibly be attributed to the degree that they implemented the participatory approach.

5. Variable G: The Development of the Abilities of Farmer Groups to Work as Group

As in previous tests of this series, the perceptions of contact farmers were used to evaluate FEWS in regard to their effectiveness in influencing farmer groups to work as group. Five specific evaluations were chosen concerning farmer group abilities for: 1) planning, 2) implementing the plans, 3) improving knowledge and skills of the group, 4) working as a team, and 5) solving own problems, each of



which was evaluated on the basis of the extent that its present level had been influenced by the work of the FEW.

A five-option type of rating scale was the instrument. First for measuring the present level of the Farmer Group abilities, the scale used was : 1 = Decreases to a Great Extent, 2 = Decreases, 3 = Constant, 4 = Increases, and 5 = Increases to a Great Extent. Second for measuring the extent of being influenced by the FEW the scale was as follows: 1 = Influenced to a Very Small Extent, 2 = Influenced to a Small Extent, 3 = Influenced to a Somewhat Extent, 4 = Influenced to a Great Extent, and 5 = Influenced to a Very Great Extent.

Table VIII presents the results, and it can be seen that the perceptions of contact farmers regarding the FEWs successes in developing the abilities of farmer groups to work as group tended to be significant, as the Farmer Group ability scores ranged from 3.46 (Constant) to 4.10 (Increases), while the influence scores ranged from 3.37 (Influenced to a Somewhat Extent) to 4.12 (Influenced to a Great Extent). In all comparisons the Upper-Group had the highest scores, followed by the Middle-Group, and with the Lower-Group having the lowest scores. Only two of the five items concerning the abilities (ability to plan and to work as a team) were significantly different among the three groups. There were strong contrasts between the Lower and Upper groups (L-U) in these two items, while all five items concerning the influence had significant differences and

TABLE VIII
PERCEPTIONS OF THE DEVELOPMENT OF FARMER ABILITIES
TO WORK AS GROUP AND INFLUENCE OF FEWS TO
ACHIEVE GROUP WORK

Ability and Influence of FEW	Mean Score for Group:			Statistical Test		
	LOWER n=12	MIDDLE n=11	UPPER n=12	Df.T H	Post-Hoc (L-M)(L-U)(M-U)	S.A n
1.Ability for Planning.	3.46	3.73	4.00	Sig	*	.34
Being Influ- enced by FEW	3.37	3.91	3.98	Sig	*	.36
2.Ability to Implement the Plans.	3.62	3.88	3.94	N.S		
Being Influ- enced by FEW	3.46	3.91	4.06	Sig	*	.29
3.Ability for Improving Knowledge & Skills of the Group.	3.75	3.98	4.10	N.S		
Being Influ- enced by FEW	3.50	3.93	4.06	Sig	*	.23
4.Ability to Work as a Team.	3.73	4.00	4.06	Sig	*	.20
Being Influ- enced by FEW	3.52	3.84	4.10	Sig	*	.26
5.Ability to Solve the Problems of the Group.	3.75	3.91	4.04	N.S		
Being Influ- enced by FEW	3.62	3.93	4.12	Sig	*	.34
Average	3.66	3.90	4.03	Sig	*	.33



these appeared to result from the significant contrasts between the Lower and the Upper groups. The strength-of-association values were 0.20 and 0.34 for the ability measurement. It appears that about 20% and 34% of variances in the ranks of the ability to work as a team and to do planning might be attributed to the degree that the FEWs implemented the participatory approach. The strength-of-association values for the influence measurement in a range of 0.20 to 0.36 indicate the percentages of variances in the ranks of the influence variable that might be attributed to the degree that the FEWs implemented the participatory approach.

6. Variable H: Rice Production by Farmers

It was assumed at the beginning of this study that rice production increases within a WKPP-area could be related to the degree that FEWs implemented the participatory approach. Rice production in Kilogram per Ha and was based on data collected from the village administration offices. After this was done, the three groups of FEWs were evaluated by their contact farmer leaders as regards to a possible association of the degree of their implementation of the participatory approach upon the increased rice yields, these were obtained by comparing previous production levels to that of the present.

Areas of rice production may be divided into 1) Intensification areas which can be subdivided further into INSUS

and INMUM areas, and 2) Non Intensification areas. Intensification areas are those where the Panca-Usaha programs are implemented more intensively under the guidance and services of GOI extension agents; these areas receive special services in the form of credit by the GOI bank, high yielding seeds, fertilizers, pesticides and insecticides by the GOI through local farmers cooperatives (KUDs). INSUS is the acronym for "INTensifikasi KhusUS", which means 'Specific Intensification', a GOI program for specific groups of farmers which are found within the same block of an irrigation system; this would be one unit. INMUM is the acronym for "INTensifikasi UMUM", which is 'General Intensification'. It is a GOI program for intensification for any farmers who will adopt the Panca-Usaha programs. INSUS farmers are usually better organized, and are given more freedom for choosing the technical inputs of the Panca-Usaha programs. Non Intensification areas are where farmers are expected by the GOI to adopt innovations through the process of diffusion, and after there have been adopted in the Intensification areas. The GOI has not provided special programs for farmers in the Non Intensification areas, as they are expected to be influenced by the Panca-Usaha programs that were implemented in the Intensification areas.

Extension services were provided to both the Intensification and Non Intensification areas, and farmers were organized into groups within both areas. The FEWs serve farmers in both areas and in the same manner.



instead of total production in order to measure rice production. Since this study was designed to find out the real effect of the implementation of the participatory approach by FEWs on the increase of rice production by farmers that are being served, yield per hectare, which is more sensitive was chosen. Increases in total production can result from many factors: better climate, increases in land area, increased numbers of farmers who plant rice during a particular season, and other factors beyond the out-reach of extension strategies. Yield per hectare avoids these pitfalls.

The FEWs in each WKPP were divided, as before, into three groups, and these were evaluated in regards to their relative influences on rice production, using four measurements: 1) rice production per Ha in the INSUS area, 2) rice production per Ha in the INMUM area, 3) rice production per Ha in the combined areas (Intensification + Non Intensification), and 4) FEWs influences upon present rice production as perceived by their contact farmers. The rice production base for comparative purposes was the average production per Ha during the last five years (1981 to 1984) in each WKPP. The fourth measurement was based on the perceptions of contact farmers regarding the last year level of production as compared to levels during the previous years and the degree of influence that the FEWs had upon level of production. A five-option rating scale was used as follows: 1 =

Decreases to a Great Extent, 2 = Decreases, 3 = Constant, 4 = Increases, and 5 = Increases to a Great Extent.

Table IX presents the areas of production in Intensification scheme, the INSUS & INMUM areas, as well as that in Non Intensification areas and the total. Statistical analyses were similar to those used previously. Comparisons of the relative influences of the three groups on the areas of rice production were not tested for significance because any differences that might exist were considered to be more related to the general policies of the GOI Intensification program than to any specific extension strategies that were developed by FEWs. However, there were wide differences among the three groups as regards their assignments to the Non-Intensification areas: the Upper-Group had 70.858 Ha (11.98% of the total), the Middle-Group had 35.870 Ha (5.40% of the total), and the Lower-Group had 242.210 Ha (45.80% of the total).

Production per Ha in the total areas includes the INSUS, INMUM, and Non-Intensification areas. The FEWs in the Upper-Group had the highest levels of production per Ha from all areas, followed, respectively, by the Middle-Group and the Lower-Group. Production per Ha was higher in the INSUS than in the INMUM area, for all three groups of FEWs. Only in INSUS area were there significant differences among the three groups. These differences were the results of the L-U significant contrasts. The strength-of-association test gave

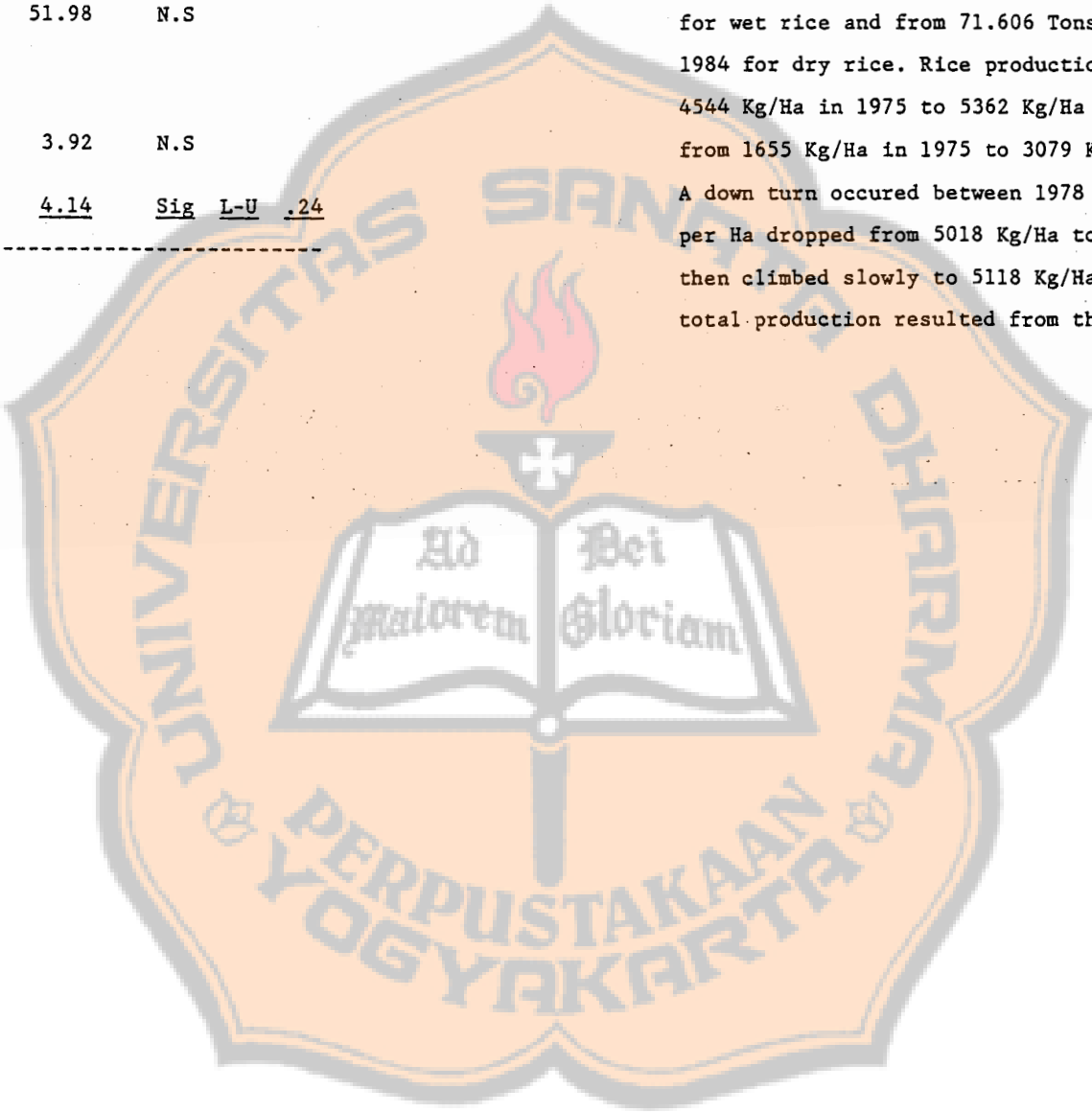


TABLE IX
RICE PRODUCTION AREAS, PRODUCTION PER HA AND
PRESENT PRODUCTION INFLUENCED BY FEWS AS
PERCEIVED BY CONTACT FARMER LEADERS

Measurement	WKPPs From:			Statistic Test	
	LOWER Group n=12	MIDDLE Group n=11	UPPER Group n=12	Df. T/Post-Hoc/S.A	H
A.Total Areas(Ha)	528.83	674.23	589.06		
Intensifica- tion:					
1.INSUS (Ha)	112.75	324.59	189.48		
(%)	21.30	48.10	32.17		
2.INMUM (Ha)	173.87	313.77	329.00		
(%)	32.90	46.50	55.85		
Non Intensifi- cation: (Ha)	242.20	35.87	70.58		
(%)	45.80	5.40	11.98		
B.Production/Ha:					
1.Total Areas (Kw/Ha)	46.35	52.80	56.28	N.S	
2.INSUS (Kw/Ha)	51.04	57.41	68.35	Sig L-U	.23
3.INMUM (Kw/Ha)	45.31	49.95	51.98	N.S	
C.Present Pro- duction as Per- ceived by Con- tact Farmer Leaders (Score)	3.73	3.61	3.92	N.S	
Being Influ- enced by FEW	3.60	4.04	4.14	Sig L-U	.24

a value of 0.25 thereby indicating that 25% of variances of INSUS peoduction per Ha was due to the degree that the FEWs implemented the participatory approach.

The contact farmers perceived that rice production in-creased during the last year when compared to the previous years. The perception scores of the contact farmers ranged from 3.61 to 3.92. Therefore they felt that the increase was influenced by the works of the FEW to a great extent; the score ranged from 3.60 to 4.14. In contrast to previous ratings, the contact farmers reversed the rankings of groups 2 and 3; group 2 had the lowest rank in this study. As differences between the Lower and Middle-Groups were not significant, this was probably a chance occurence. It is conforiting that the Upper-Group still ranked in the first position. Being compared to the overall picture of rice production in the DIY during 1975 to 1984 (see Appendix B), the perceptions of contact farmers appeared to fit the actual production figures quite well. Total production increased from 495.783 Tons in 1975 to 619.064 Tons in 1984 for wet rice and from 71.606 Tons in 1975 to 129.182 Tons in 1984 for dry rice. Rice production per Ha increased from 4544 Kg/Ha in 1975 to 5362 Kg/Ha in 1984 for wet rice and from 1655 Kg/Ha in 1975 to 3079 Kg/Ha in 1984 for dry rice. A down turn occured between 1978 and 1981 when production per Ha dropped from 5018 Kg/Ha to 3811 Kg/Ha; however, it then climbed slowly to 5118 Kg/Ha in 1982. The increases of total production resulted from the increases of production



per Ha; the areas of production were almost constant during the period.

7. Variable I: Effect of FEW Performances,
as Perceived by Their Contact Farmer
Leaders, on Farmer Incomes

The effects of the implementation of the participatory approach by FEWs on farmer incomes appeared to be quite indirect, many intervening variables could affect incomes. It was chosen to measure farmer incomes by the use of contact farmer scoring data rather than the use of nominal data. The contact farmer data was obtained by using a five-option-rating scale, as follows: 1 = Decreases to a Great Extent, 2 = Decreases, 3 = Constant, 4 = Increases, and 5 = Increases to a Great Extent. The influences of the FEWs were scored as follows: 1 = Influenced to a Very Small Extent, 2 = Influenced to a Small Extent, 3 = Influenced to a Somewhat Extent, 4 = Influenced to a Great Extent, and 5 = Influenced to a Very Great Extent. As in Variable H the views of contact farmer leaders concerned their valuations of FEWs regarding their influences on farmer income.

Rice farmer incomes include rice farming plus that from other farming operations; many are grown on the same field after the rice harvest. Also some crops are grown during the same season as rice. Both income sources are used to measure rice farmer income.

Table X presents the results of the two income measurements and the statistical analyses were similar to those used previously.

TABLE X
RICE FARMER INCOME AS PERCEIVED BY CONTACT
FARMER LEADERS

Income Source and FEW Influ- ences	Mean Score for Group:			Statistical Test		
	LOWER n=12	MIDDLE n=11	UPPER n=12	DF.T	Post-Hoc	S.A
				H	(L-M)(L-U)(M-U)	n
A.Rice Farming	3.85	3.48	3.94	N.S		
<u>Influenced by FEW</u>	<u>3.54</u>	<u>4.00</u>	<u>3.98</u>	N.S		
B.Other Farming	3.67	3.82	3.98	Sig	*	.18
<u>Influenced by FEW</u>	<u>3.76</u>	<u>3.65</u>	<u>3.96</u>			
Average Income	3.76	3.65	3.96	Sig	*	.33

The influences of FEWs on farmer incomes as perceived by the contact farmer leaders appeared to be high; the income level scores ranged from 3.48 (Constant) to 3.98 (Increases), while the influence scores ranged from 3.54 (Influenced to a Great Extent) to 4.00 (Influenced to a Great Extent). In both measurements the Upper-Group still had



highest scores except in the second item, in which case score 3.98 for the Upper-Group was equal to the score 4.00 for the Middle-Group. The Lower-Group was in the second while the Middle-Group in the third places, indicating that the two groups were quite closely in the eyes of contact farmers. Differences were not significant in any case.

When compared to the report of "Dinas Pertanian Tanaman Pangan DIY" on farmer incomes during the last four years (1981-1984) (Appendix C), the perceptions of contact farmer leaders seemed to fit only part of the reality. The perceptions ranged from "constant" to "increases", while the report revealed trends of decreasing rice yields in the irrigated area; wet rice yields showed 13.21% annual decrease. For other less important crops, the yields of soybean decreased 7.92%, cassava 10.14%, tomatoes 14.19%, and "buncis" 22.26%. In the case of wet rice, it was reported that the income decrease was caused by the 21.47% annual increase of cost, while the total production only increased 5.18% per year. The increase of production costs came mostly from the tremendous increase of the cost of farm labor, which was estimated to be about 28.35% per year. This included the labor from the farmer families as well as that from outside (See Appendix D). Since most of the farm labor cost returned to the farmer households as income outside of their own farming operations, it appears that the overall farmer incomes were improved.

The Effect of the Implementation of the Participatory Approach on the Accomplishments of the Seven Extension Targets

By its nature, Kruskal-Wallis Statistic test is an One-Way Analysis of Variance test, called by Ferguson (1981) the "Kruskal-Wallis-One-Way Analysis of Variance by Ranks". The most common use of the ANOVA is to test for the effect of certain variables on other variables. Figure 10 shows graphically the effects of the implementation of the participatory approach on the accomplishment of the seven extension targets. The locations of the three groups on the "abscissa" as determined on the basis of the Variable A average score for each group, indicate the extent of the implementation of the participatory approach. The values at the "ordinate" were the average values of the seven accomplishment variable scores. The lines indicate the trends of the effects, which appear to be positive. Because the levels of the implementation of the participatory approach are not equally spaced, the "Polynomial Trend" test, usually used in the Kruskal-Wallis model to determine whether the trend is linear, quadratic, or cubic (Keith, 1974), could not be used. However, it appears that some trend lines (Variable C, D, E, and F) are linear, which indicated that the effects were constant. The other trend lines (Variable G, H, and I) do not appear to be linear, which is interpreted to mean that the effects are changing. Unfortunately, there was no way to indicate when or at what levels of implementation of this



approach, the effect would be maximal or minimal. A more advanced study is needed to answer this question.

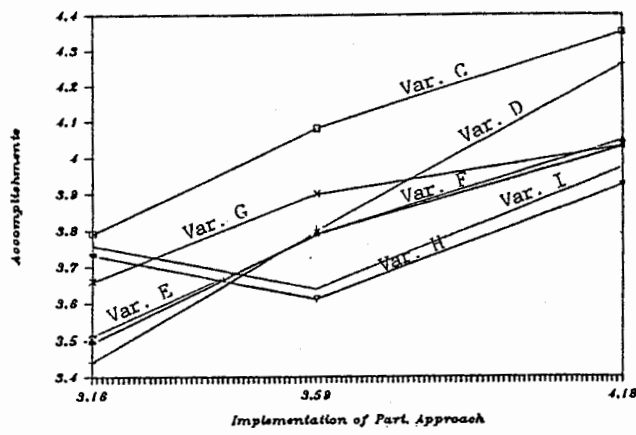


Figure 10. The Effect of the Implementation of the Participatory Approach on the Accomplishment of the Seven Extension Targets

The Upper-Group appears to exceed the two other groups in the implementation of the participatory approach as shown by the farther position of the group compared to the two others. By noticing the range of the seven accomplishment values of the Upper-Group, of which the lowest value is

still above the highest value of the Lower-Groups, it appears that the Upper-Group exceeds, and quite far, the Lower-Group in all seven areas of accomplishment. One variable, the appropriateness of the FEW recommendations, indicated to be the highest among the seven targets. No variable was constantly lower than the others.



CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purposes of this chapter are to present summaries of the following topics: purposes of the study, its basic rationale, design, its major findings, conclusions and recommendations.

Purpose and Objectives of the Study

The purpose of this study was to determine if the degree to which FEWs implemented the participatory approach influenced rice production in the Daerah Istimewa Yogyakarta. The following objectives were put forth to study the purpose: 1) to measure the degree that the FEWs in the DIY had implemented the participatory approach, 2) to classify the FEWs into three different groups based upon the measurement results of objective number 1, 3) to describe the specific characteristics of the three FEW groups, 4) to compare the accomplishments of the three groups of FEWs in bringing about changes in rice farming through the use of seven selected extension targets: (1) the appropriateness of FEW recommendations, (2) number of farmers adopting the recommended practices, (3) the ability to readily identify

farmer problems, (4) the ability to solve farmer problems, (5) the development of the abilities of farmers to work as groups, (6) the level of rice production, and (7) the level of rice farmer incomes.

Rationale of the Study

The participatory approach in the context of the development of T & V Extension System as a "bottoms-up" system appears to offer much promise. There are indications that many benefits can be expected from it when it is properly implemented at the village level. It promises to offer extension programs that are more appropriate to farmer needs, more flexible, greater applicability to various systems of farming, greater participation of farmers in attending the regular meetings, and greater feedback from farmers.

Various kinds of measurement were carried out in this study concerning the implementation of the participatory approach by the FEWs at the village level. It is hoped that by the use of these measurements, the real effects of the participatory approach were determined.

Design of the Study

This was a type of case study. Groups of FEWs working closely with rice farmers under the T & V Extension Systems were subjects for analysis.



Data collection was divided into three stages, and these were carried out consecutively, involving different people and questionnaires. The first questionnaire (Appendix A, Form 1) was a self-assessment questionnaire for completion by the entire FEW population in the DIY. The second questionnaire (Appendix A, Form 2) was also a self-assessment questionnaire but was limited to the FEW samples. The third questionnaire (Appendix A, Form 3) was an evaluation questionnaire which evaluated the performances of their FEWs.

Classification of the FEWs was accomplished by the use of ranking procedure using percentile scores. The percentile rank of each FEW determined whether he or she was placed in a Lower, Middle, or Upper-Group. The Lower-Group consisted of FEWs with average scores below the 33rd percentile for the instruments dealing with Variables A and B. The Middle-Group consisted of FEWs with average scores between the 33rd and 67th percentile, while the Upper-Group consisted of FEWs with average score above the 67th percentile.

The two instruments used for classification purposes, were tested for reliability and possible associations with each others.

In the comparison of the FEW groups, the following items were studied: family background, familiarity with the farming practices used in this area, backgrounds in education and training, regularity of meetings within their farmers, and other personal perceptions. The main

investigation was concerned with measurement of the degree by which the three groups of FEWs differed in their accomplishments in carrying out the T & V Extension System. Seven extension targets (Variable C, D, E, F, G, H, and I) were selected and each FEW was evaluated regarding how well he/she carried out these. Differences in performances of FEWs were determined and tested by using three different statistical methods. An outline of this study is exhibited in Figure 3 & 5 of Chapter III.

Major Findings of the Study

The major findings of this study were divided into four sections in keeping with the four objectives of the study. One additional section is used for a synthesis. These are as follows:

1. The Extent to which the FEWs Implemented the Participatory Approach.
2. Classification of the FEWs into Three Groups.
3. Specific Characteristics of the Three Groups.
4. A Comparison of the Accomplishments of the Three Groups:
 - a. Appropriateness of the FEW Recommendations Concerning the Panca-Usaha and Two Additional Programs.
 - b. Number of Farmers Who Adopted the Recommended Practices.
 - c. Ability of the FEWs to Readily Identify Farmer



Problems.

- d. Ability of the FEWs to Solve Farmer Problems.
- e. Development by FEWs of Farmer Abilities to Work as a Group.
- f. Farmer Rice Productions.
- g. Farmer Incomes.

5. A Synthesis: The Effect of the Implementation of the Participatory Approach on the Accomplishments of the Seven Extension Targets

The Degree of the FEWs Implementing the Participatory Approach. Evaluation on the individual items of the Variable A instrument gave evidences as follows:

1. The 24 principles of the participatory approach were implemented "occasionally" to "often" by the 142 FEWs working with the rice farmers in the DIY.
2. The principles of participatory approach that concern the development of appropriate learning activities and recommendations, programs for farmer groups, the encouragement of farmers to use their own initiatives for the identification and solving of their own problems, and the allowing of farmers to seek information and assistance elsewhere appeared to be less well implemented than those principles that concern the development of teaching methods and the channeling farmer interests and complaints.

Studies on the individual items in the Variable B instrument revealed the following results:

1. The 16 benefits resulting from the FEW implementation

of the participatory approach gave values of "occasionally" to "often".

2. The range between the lowest (3.24) and the highest scores (3.83) was very small.

3. The lowest score was obtained in the item, "Farmer group abilities to select appropriate recommendations".

4. The highest score was obtained in the item, "Materials presented during visitations meetings became easier to understand".

Classification of the FEWs into Three Groups. The study involved 142 FEWs, but only 88 (61.97%) met conditions for classification into groups as the result of the strengthening of the criteria. Only 29 FEWs met conditions for classification into Lower-Group, 28 into Middle-Group, and 31 into Upper-Group. The next step involved the selection of 12 FEW samples for the Lower-Group, 11 for the Middle-Group, and 12 for the Upper-Group; these constituted the final samples for analysis purposes.

Specific Characteristics of the Three FEW Groups.

Table XI was developed to summarize findings of the study related to characteristics of the three FEW groups.

As shown by Table XI there were wide differences among the three groups.

A greater number of the FEWs in the Upper-Group grew up on a farm, were still farming, and had an above average knowledge of the farming area. This group tended to live



TABLE XI

DIFFERENCES AMONG THE THREE GROUPS IN TERMS OF SPECIFIC CHARACTERISTICS

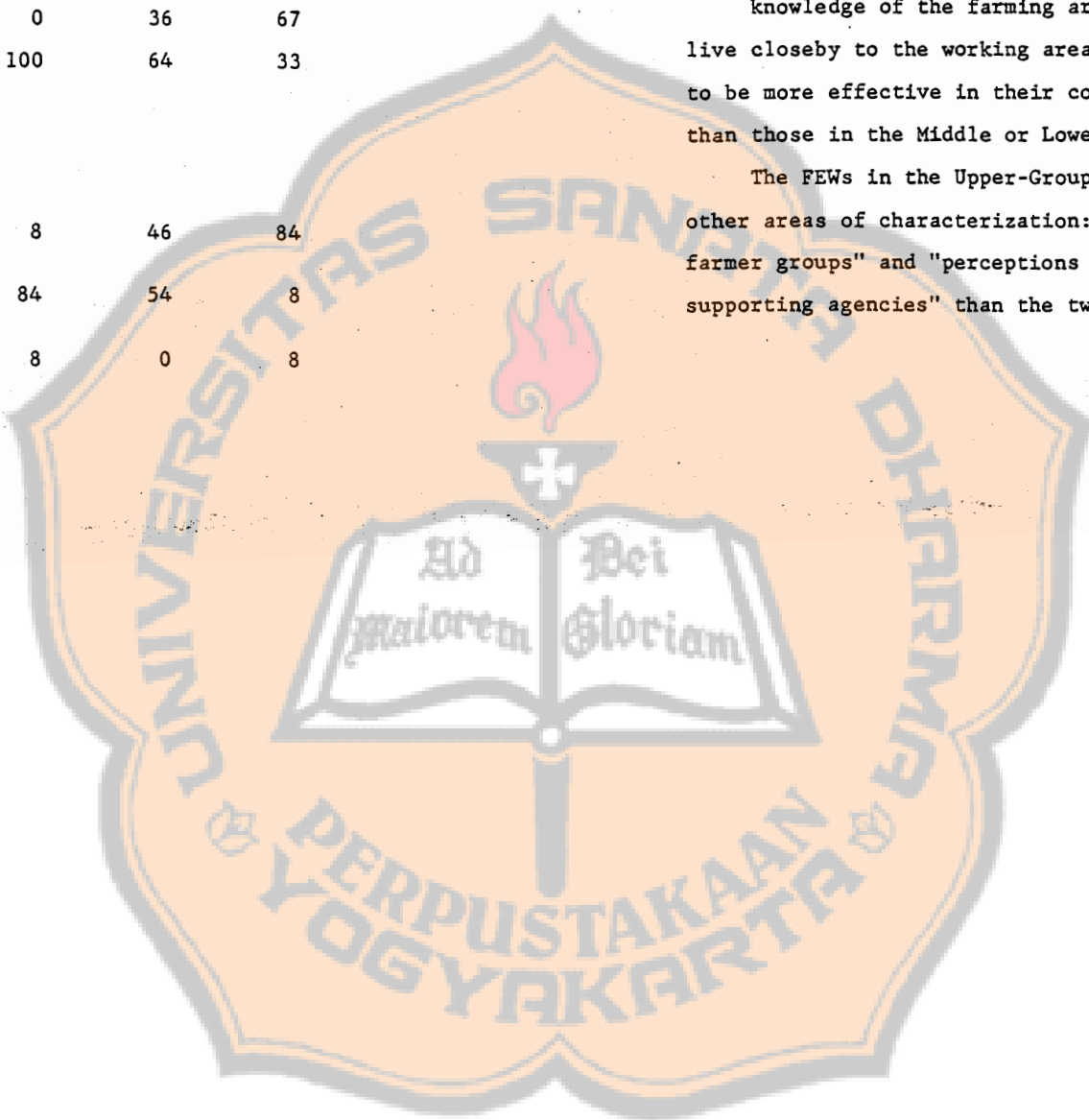
Areas of Characterization		LOWER Group	MIDDLE Group	UPPER Group
A. Familiarity with Farming Life:				
1. Grew-up on a Farm (%)		33	64	67
2. Still Farming as a Secondary Job (%)		17	36	42
B. Residence Close-By to the Working Area (Km)				
		10.1	4.3	3.3
C. Above Average Knowledge of the Working Area (%)				
		8	64	67
D. Capabilities for Developing Farmer Groups:				
1. Number of Group Already Formed (Group)		33	37	55
2. Meet Regularly With Farmer Groups (%)		33	36	67
3. Attendance of Farmers to Meetings:				
- Above 50% (%)		0	36	67
- Below 50% (%)		100	64	33
E. Perceptions of the Supporting Agencies:				
1. REC Training Programs:				
- Helps to a very great extent (%)		8	46	84
- Helps to a great extent (%)		84	54	8
- Helps to a somewhat extent (%)		8	0	8

TABLE IX (Continued)

2. Solution of Farmer Problems by Extension Officers:				
- Very Satisfactory (%)		8	0	24
- Satisfactory (%)		50	45	34
- Somewhat Satisfactory (%)		34	55	34
- Less Satisfactory (%)		8	0	0
3. Village Officers:				
- Support to a very great extent (%)		8	18	42
- Support to a great extent (%)		42	36	33
- Support to a somewhat extent (%)		50	46	17
- Support to a lesser extent (%)		0	0	8

knowledge of the farming area. This group tended to live closeby to the working area. Also this group appeared to be more effective in their communications with farmers than those in the Middle or Lower-Group.

The FEWs in the Upper-Group ranked higher in the two other areas of characterization: "capability for developing farmer groups" and "perceptions regarding the values of supporting agencies" than the two other groups. Also the two



the values of the supporting agencies to their extension program.

A Comparison of the Accomplishments of the Three Groups. Differences in the groups in regards to the relative abilities to solve farmer problems were wide. Also, there were wide differences in regards to the appropriateness of their recommendations for farmer use. Seven items which were considered appropriate, were compared and there were significant differences between groups in five of these items.

Differences between the three groups were less distinctive when the measurement were the number of adopter farmers, the abilities of FEW to readily identify farmer problems, their developments of farmer group abilities to work as group, and to increase levels of rice production.

Difference between the three groups of FEWs were not significant when farmer income was the variable.

In the following subsections, there is a consideration given to how well each group of FEWs performed in meeting the extension goals.

Differences in the performances of the three FEW groups regarding the Appropriateness of the FEW Recommendations were significant when five of the seven items were studied. The greatest differences were between the Upper and Lower-Groups, with the Middle-Group being intermediate, yet still different from either the Upper or Lower-Group. The appropriateness of all FEW recommendations as perceived by the

contact farmers were high. The Upper-Group had the highest score, followed consecutively by the Middle and the Lower Groups. The variances in the ranks of appropriateness of recommendations that could be attributed to the degree that the FEWs implemented the participatory approach were in the range of 21% to 35%.

Differences between the abilities of the three FEW groups to attract Farmers to Adopt the Recommended Practices were significant in the following practices: 1) Pest & Diseases Control, 2) Cropping Techniques, 3) Pola-Tanam, and 4) Pasca-Panen Practices. The differences were accounted for by the Lower-Upper and Middle-Upper comparisons of contrasts and never by the Lower-Middle comparison of contrast. The scores were a bit lower when compared to those obtained when the perceptions of contact farmers concerning the other extension targets were made. The Upper-Group still had the highest score, followed, respectively, by the Middle and the Lower Groups. The variances in ranks of the number of farmers adopting the recommended practices that could be attributed to the degree that the FEWs implemented the participatory approach were in the range of 26% to 41%.

In regards to the Ability of FEW to Readily Identify Farmer Problems there were significant differences in six of the nine problems being analyzed. The six problems were: 1) Control of Any New Explosions of Pests & Diseases, 2) Handling of Farmer Complaints, 3) Lack of Farmer Knowledge & Skills, 4) Solving of Farmer Group Internal Problems,



5) Constraints of Local Custom of Farmers, and 6) Post Harvest Problems. Three of the six differences were caused by Lower-Upper and Middle-Upper contrasts, while the three others were caused only by the Lower-Upper contrast. The difference in the average of the total scores was due to the Lower-Upper contrast. The scores obtained were considered to be high. The Upper Group had the highest scores, followed respectively by Middle and Lower Groups About 25% to 54% of the variances in the ranks of the ability of FEWs to readily identify farmer problems concerning the six problems mentioned above could be attributed to the degree that FEWs implemented participatory approach.

In regards to the Ability of FEW to Solve Farmer Problems there were significant differences in the relative abilities of the three groups to solve eight of the problems being analyzed, and they were: 1) Control of New Explosions of Pests & Diseases, 2) Handling of Farmer Complaints, 3) Technological Problems, 4) Drought, Flood, and Erosion, 5) Lack of Farmer Knowledge & Skills, 6) Solving of Internal Problems in Farmer Group, 7) Constraints due to the Local Farmer Customs, and 8) Post Harvest Problems. Only one difference was caused by Lower-Upper and Middle-Upper comparisons of contrast, while the seven others were caused by the Lower-Upper comparison of contrast. When the average of the total scores was the consideration, there was a significant difference in the Lower-Upper contrast. The scores were considered to be high. The Upper-Group had the

highest level, followed, respectively, by the Middle and the Lower Groups. The variances in the ranks of FEW abilities to solve the eight problems that could be attributed to the degree that the FEWs implemented the participatory approach were in the range of 22% to 51%.

Differences in the accomplishments of the three FEW groups as regards their influences on the Development of the Abilities of Farmer to Work as Group were significant in only two of the five items measured: ability for planning and ability to work as a team. These differences resulted from the Lower-Upper strong contrasts. The scores were considered to be high. The Upper-Group had the highest, followed respectively by the Middle and Lower-Group. The variances in ranks of the achievement of the two abilities that could be attributed to the degree that the FEWs implemented the participatory approach were 20% and 34%, while the variances in ranks of the FEW influences that could be attributed to the degree that the FEWs implemented the participatory approach were in the range of 23% to 36%.

In regards to Rice Production area, the Upper-Group had an average of 189.48 Ha in INSUS (32.17%), 329.00 Ha in INMUM (55.85%), and 70.58 Ha in the Non Intensification (11.98%). The Middle-Group had an average of 324.59 Ha in INSUS (48.10%), 313.77 Ha in INMUM (46.50%), and 35.37 Ha in the Non Intensification area (5.40%), while the Lower-Group had an average of 112.75 Ha in INSUS (21.30%), 173.87 Ha in INMUM (32.90%), and 242.20 Ha in the Non Intensification



area (45.80%). The Upper and Middle Groups worked primarily in the two Intensification areas, while the Lower-Group dominated in the Non Intensification area, having over 50% of the area. The Upper-Group had productions per Ha of 5628 Kg/Ha (6835 Kg/Ha from INSUS, and 5198 Kg/Ha in the INMUM area), while the Middle-Group had productions per Ha of 5280 Kg/Ha (5741 Kg/Ha in INSUS, and 4995 Kg/Ha in INMUM area), while the Lower-Group had productions per Ha of 4835 Kg/Ha (5105 Kg/Ha in INSUS, and 4531 Kg/Ha in INMUM area). Differences in the influence of the three groups of FEWs on rice production as measured by Kg/Ha were significant in the INSUS area. About 23% of the variances in the ranks of production per Ha in INSUS area could be associated with the degree that FEWs implemented the participatory approach. The scores obtained were considered to be high. The Upper-Group had the highest scores, followed respectively by the Lower and the Middle Groups. About 24% of the variances in the ranks of the FEW influence might be associated to the degree that FEWs implemented the participatory approach.

Differences in regards to Farmer Incomes were not significant as regards the perceptions of contact farmers on FEW influences. However, differences were significant when income levels from the farming enterprises outside rice were considered. These differences resulted from the significant contrasts between Lower and Upper-Groups. About 18% of the variances in the ranks of the income levels from other

farming sources could be attributed to the degree that FEWs implemented the participatory approach.

The scores as regards the perceptions of contact farmers were considered to be high. The Upper-Group had the highest score, followed, respectively, by the Lower and the Middle Groups when income from rice farming was considered. The lowest score was in the Lower-Group when other income sources were considered.

A Synthesis: The Effect of the Implementation of the Participatory Approach on the Seven Extension Targets.

Overall, it was found that the FEWs classified into the Upper-Group, indicating they had most fully implemented the participatory approach and experienced benefits of such an approach to a greater extent, was always in the first place in every accomplishment analysis that was considered. Further, even the lowest values for the Upper-Group were always higher than the highest values for the Lower-Group.

The appropriateness of the FEW recommendations, was one of the indications of the extent to which the participatory approach had been implemented. This was perceived by contact farmer leaders as the highest among the seven extension targets. When shown graphically (Figure 8), there is a constant and linear uprise, thereby giving further evidence. The same thing happens to the other target, the number of farmers who adopted the recommended practices. It appears that the performances of the FEW groups greatly influenced these two targets.



Conclusions

The analysis of data and subsequent findings were the basis for the following conclusions:

1. The participatory approach implemented by FEWs appears to have had real and positive effects on rice farming in the DIY as it could be traced through the superior performances of the Upper-Group who implemented the approach to the greatest extent. The Upper-Group had always the highest scores in the overall ratings.

2. As perceived by farmers, the appropriateness of recommendations and number of farmers who adopted them are the best indicators of success of implementation of the participatory approach.

3. A strong effect which appeared also on the INSUS program might refer to factors within the program such as: the dynamism of the INSUS farmer groups, the freedom and priority of services given to the farmers who adopted the program, and the better training of the FEWs who were responsible to the success of the program.

4. The superior performances of the Upper-Group are related to their willingness to deal more directly with the people and are supported especially by their familiarity with farm life, closeness of their residence to the working area, knowledge of the working area, capability for developing farmer groups, their positive perceptions about the supporting agencies, and their regularity in visiting farmer groups.

5. The instruments used for classification of respondents were reliable instruments and were closely related. It was essential to use both for proper classification of the respondents.

6. The 24 principles of the participatory approach were well implemented. The different degrees of implementation among the individual principles were influenced by factors such as: level of area covering, training of FEWs at the RECs, problems in the field, conditions of farmer, and the easeness of the principles to be implemented.

7. The small score range for the participatory approach benefits might simply reflect the less distinctive perceptions of the FEWs to what they experienced. The highest score indicated how the FEWs did benefit a great deal from their use of better teaching methods and improved communications with the farmers.

8. Age, length of working experience, and length of stay in the present WKPPs appeared to have no relationship to the extent that the FEWs implemented the participatory approach.

9. As they had higher farmer attendances in their more regular meetings, the FEWs from the Upper-Group appeared to be more capable in building effective communication with the farmers.

10. In addition to the evident impact on rice production and incomes, the effects of the implementation of the participatory approach on the accomplishment of the other



five extension targets appeared to be positive and significant.

11. When rice production increased from 495.783 Ton to 619.064 Ton for wet rice and from 71.606 Ton to 129.182 Ton for dry rice between 1975 and 1984, the life of farmers was really better-off as perceived by the contact farmer leaders.

12. The T & V Extension System had been well accepted. The better-off life of farmers since its installation seems to affect it. In such a situation permanent changes seem to be more likely to take place.

Recommendations

1. The GOI's farmer-grouping strategy should be continued because it helped the T & V Extension System and INSUS program work effectively in the DIY province that the rice production gained back the level as before the "levelling-off", even higher.

2. The way for developing a "bottom-up" system in extension should be through the strengthening of linkages within the triangular structure: research-extension-farmers. Only through this way can a comprehensive bottom-up system be established which can affect more permanent changes.

3. Efforts to improve the existing system should be concentrated on the most strategic area, which is the development of appropriate recommendations for farmers. First effort could be taken in the carrying out of well

designed farm trials in the farmer fields by involving farmers as much as possible.

4. The policy of the GOI to use graduates of Vocational Agricultural School should be continued. The relatively young age of these graduates should not be considered as a limiting factor to make them capable in carrying out effectively the participatory leadership functions for the farmers.

5. To be more effective in carrying out participatory approach, a FEW should be required to live close to the working area, to still practice farmings, to spend enough time in trying to know better the working area, and to maintain the regularity of visiting and conducting of the farmer meetings.

6. It is necessary that the GOI implement an incentive policy. The forms of incentive could be: better transportation means, recognition, award, chance to get advanced training, or even promotion of job. These incentives function as stimulants to encourage FEWs to perform as well as possible in implementing the participatory approach.

7. Non technical areas of farmer problems should be covered adequately in the FEW training programs at the RECs. Resource persons should be provided from outside in case that the department doesn't have qualified people. The participatory approach is the right approach in dealing with such problems.



8. Each FEW is recommended to use the Operational Guidelines developed by the GOI in a creative way by using his or her own record-book where have been recorded all steps already taken and their results in dealing with all impact points which he or she did try to carry out, field observation findings, farmer complaints, and any remedial treatments having been taken.

9. All records documented in the FEW record-book should be made available to be utilized by the members of the FKPP (= "Forum Komunikasi Penyuluhan Pertanian" : Agricultural Extension Coordinator Committee), GOI's surveyors, and those who are responsible for the development of the local agricultural extension programs. A communication network functioning as a linkage at the field level should be established involving contact farmer, FEWs, AEOs, SMSs, and administration staffs.

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APPENDIXES



APPENDIX A
(Form 1)

QUESTIONNAIRE FOR CLASSIFICATION

Name of your WKPP: _____
Your Age: _____ Years.
The length of your working experience as a FEW: _____ Years.
The length of time in your present WKPP: _____ Years

Instruction

The following questions should be answered by placing a checkmark () in the answer which best fit your situation.

1. To what extent did you implement each of the following principles/strategies in carrying out your job as a Field Extension Worker (FEW)?

Selected Principles/Strategies of the Participatory Approach as Used in the Training & Visit Extension System.	Never	Seldom	Occasionally	Often	Always
	1	2	3	4	5
1.1. Involving farmers in the process of planning & developing extension activities at the farmer group level.					
1.2. Encouraging farmer group to independently choose their own leaders.					

APPENDIX A
INSTRUMENTS

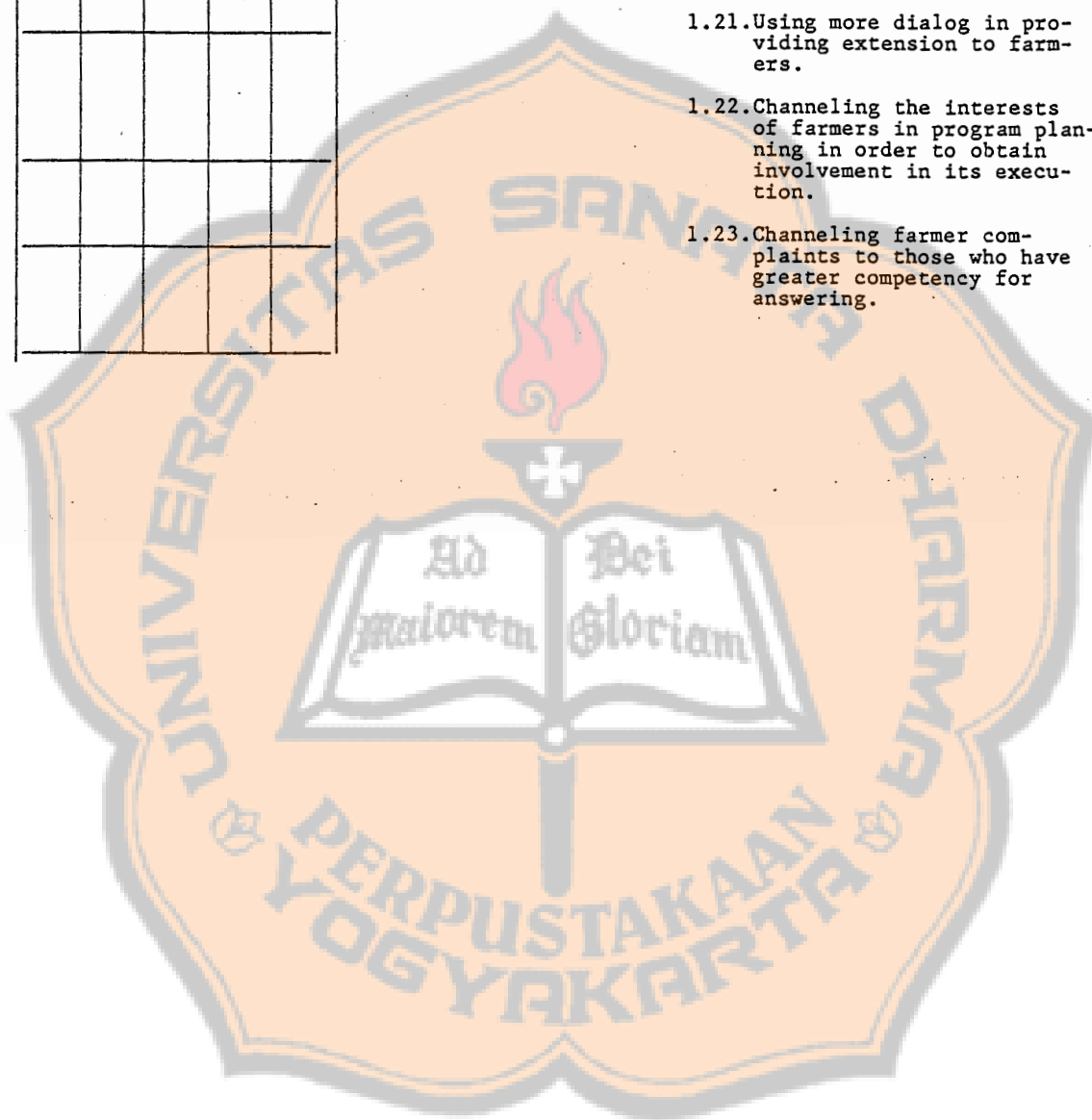


APPENDIX A. Form 1 (Continued)

	1	2	3	4	5
1.3. Permitting farmer groups to determine for themselves whether to accept or reject recommendations given from the outside.					
1.4. Allowing farmer group to modify recommendations as needed.					
1.5. Involving contact farmers in choosing topics & materials for visitation meetings.					
1.6. Involving farmers outside of the contact farmer group to choose topics & materials for visitation meetings.					
1.7. Utilizing knowledge of progressive farmer groups in collecting materials for developing better programs.					
1.8. Utilizing failure experiences of farmer groups in collecting materials for developing better programs.					
1.9. Utilizing success experiences of farmer groups in collecting materials for developing better programs.					
1.10. Conducting a mini survey of the social & economic life of the farmer group, before planning a program for that group.					
1.11. Encouraging regular feedback from contact farmer leaders.					
1.12. Encouraging regular feedback from contact farmers outside of the leader groups.					

APPENDIX A. Form 1 (Continued)

	1	2	3	4	5
1.13. Encouraging regular feedback from progressive farmers within the groups.					
1.14. Encouraging regular feedback from follower farmers within the groups.					
1.15. Encouraging farmer groups to identify their own problems.					
1.16. Encouraging farmer groups to solve their own problems.					
1.17. Allowing farmer groups to seek information and assistance outside the GOI network.					
1.18. Encouraging farmer groups to take initiatives.					
1.19. Helping farmer group members to build courage in order to better express their own opinions.					
1.20. Avoiding the tendency of FEW dictatorship in providing recommendations for farmers.					
1.21. Using more dialog in providing extension to farmers.					
1.22. Channeling the interests of farmers in program planning in order to obtain involvement in its execution.					
1.23. Channeling farmer complaints to those who have greater competency for answering.					



APPENDIX A. Form 1 (Continued)

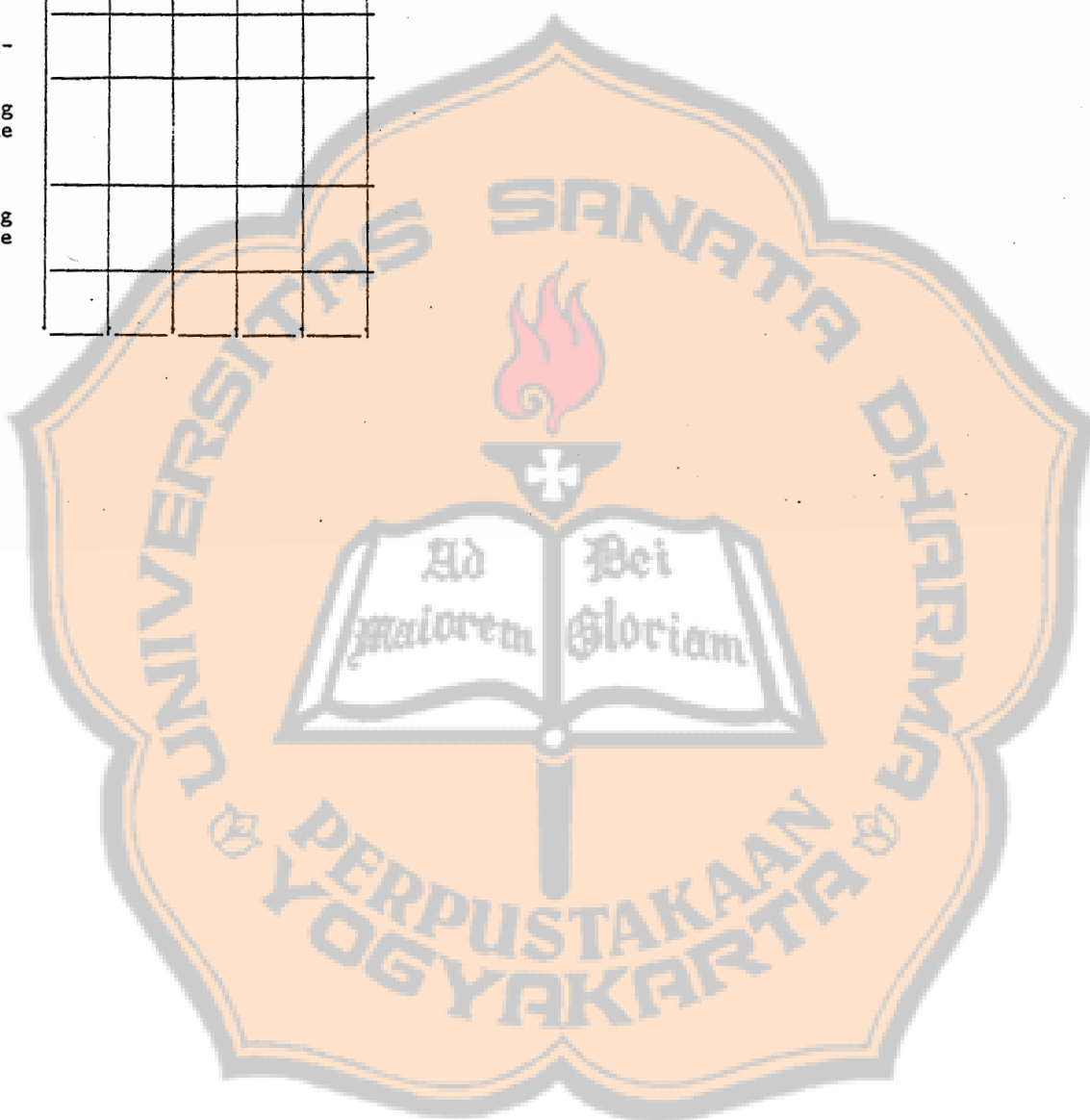
	1	2	3	4	5
1.24.Helping farmer groups to establish self-confidence and more independence.					

2.To what extent do you believe that you experienced the following benefits that might be expected from implementing the participatory approach principles/strategies in your extension work in the WKPP?

Benefits of Implementing the Participatory Approach Principles/Strategies.	1 Never	2 Seldom	3 Occasionally	4 Often	5 Always
2.1.Farmer groups are able to select recommendations which are appropriate for adoption.					
2.2.Farmer group becomes compact that makes easier in conducting uniform activities.					
2.3.Increased sense of responsibility among the group members.					
2.4.Increased sense of self-confidence of group in facing new problems.					
2.5.Increased sense of belonging by group members.					
2.6.Materials presented during visitation meetings become more fitting to the needs of its farmers.					
2.7.Materials presented during visitation meetings become easier to understand.					
2.8.Presentations have become more attractive.					

APPENDIX A. Form 1 (Continued)

	1	2	3	4	5
2.9.Increased creativeness within the group.					
2.10.Continuous improvement in relationship & cooperation among group members.					
2.11.More complete adoption of Panca-Usaha programs by group members.					
2.12.Better utilization of the various kinds of skills and abilities of the group.					
2.13.Farmers become more willing to attend their regular meetings.					
2.14.Increased interest of farmers in agricultural innovations.					
2.15.Farmers begin to see more alternatives for solution of their problems.					
2.16.Increased solution of problems by the farmers themselves.					



APPENDIX A.
(Form 2)

QUESTIONNAIRE FOR EXPLORATION

Name of your WKPP : _____, Your BPP : _____

Instruction

The following questions should be answered by placing the check-mark () by the answer which best fits your situation or you may write a complete answer in the open space provided.

1. Where do you live?

Answer:

- A. () Within the working area.
B. () Outside of the working area.

2. For those who live within the working area: What kind of status do you have now?

Answer:

- A. () Local resident living with your parents and other family's members.
B. () Non resident who married to a member of the community.
C. () Non resident who lives within the community on a temporary basis.
D. () Non resident who lives within the community only during week-days.
E. () Others: _____ (Mention!)

3. For those who live outside your working area: How far is your residence from your working area and what kind of transportation do you use to go to the working area?

Answer:

- A. The distance: _____ Km (Kilometer).
B. The transportation used: _____ (Write in!)

4. What kind of transportation do you use in carrying on your job and what is its present condition?

Answer:

- A. () Motorcycle owned by yourself. Condition: _____.
B. () Motorcycle borrowed from the office. Condition: _____.
C. () Public transportation. Condition: _____.
D. () Bicycle. Condition: _____.

5. What was the occupation of your father?

Answer:

- A. () Farmer.
B. () Farm Labor.
C. () Worked outside farming as: _____ (Mention!)

6. Mention your formal educational background and the length of the schooling years!

Answer:

- A. () Elementary School (SD) for: _____ years.
B. () Junior High School (SMP) for: _____ years.
C. () Vocational Agricultural School (SPMA) for: _____ years.
D. () General Senior High School (SMA) for: _____ years.
E. () Other School at the High School level: _____ (Mention!) for: _____ years.
F. () University/College: _____ (Mention!) for: _____ years.



7. Beside your main job as a FEW do you have a secondary job?

Answer:

- A. () Yes. It is: _____ (Mention!).
B. () No.

8. What is your motivation for having a secondary job?

Answer:

- A. () It is my hobby.
B. () Need additional income.
C. () Learning new skills to prepare other job.
D. () For escaping from the boring FEW works.
E. () To help friends.
F. () Others: _____ (Mention!).

9. How do you perceive your present work as a FEW?

Answer:

- A. () Being a FEW is my chosen career.
B. () I obtained it by accident. I could not refuse it.
C. () It is expected to be only temporary job.
D. () This work is better than being unemployed.
E. () It has fitted me well and I find myself being quite settled.
F. () Others: _____ (Mention!).

10. How many farmer groups do you have in your WKPP?

Answer:

- A. () "Klompen" (= Kelompok Pendengar : Radio Listening Group) in a number of _____ groups.
B. () "Klompir" (= Kelompok Pirsawan : TV Watching Group) in a number of _____ groups.

C. () "KTW" (= Kelompok Tani Wanita : Women Farmer Group) in a number of _____ groups.

D. () "RPH" (= Kelompok Pemuda Tani : Young Farmer Group) in a number of _____ groups.

E. () "RPH" (= Regu Pemberantas Hama : Pests & Diseases Control Group) in number of _____ groups.

F. () "KTDH" (= Kelompok Tani Dewasa Hamparan : Area Adult Farmer Group) in a number of _____ groups.

G. () Others: _____ (Mention!) in a number of _____ groups.

11. What is your perception of communication you have with your farmers?

Answer:

- A. () Very good.
B. () Good.
C. () Average.
D. () Poor.
E. () Very poor.

12. How many members usually attend your farmer group meetings?

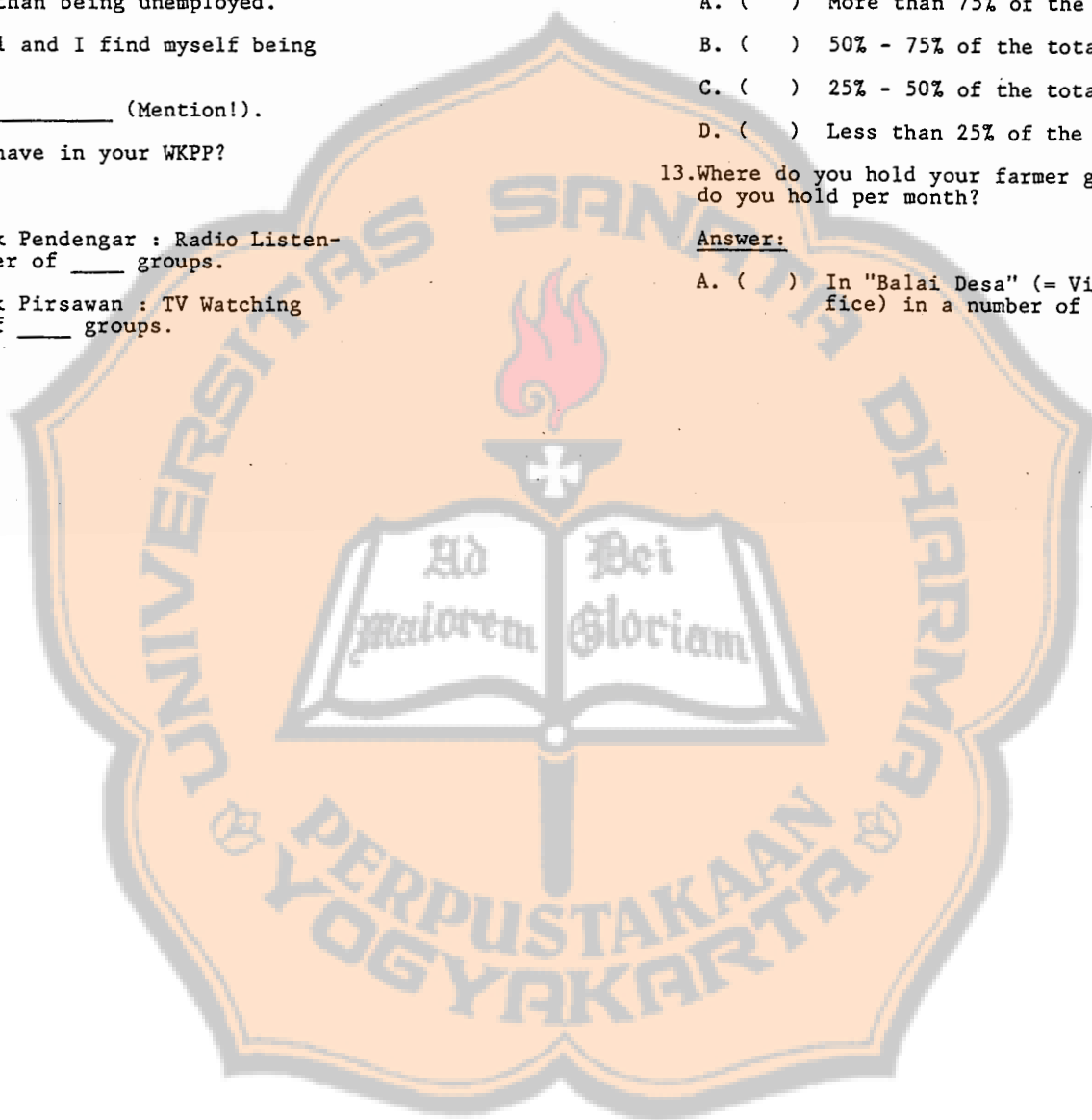
Answer:

- A. () More than 75% of the total members.
B. () 50% - 75% of the total members.
C. () 25% - 50% of the total members.
D. () Less than 25% of the total members.

13. Where do you hold your farmer group meetings and how many do you hold per month?

Answer:

- A. () In "Balai Desa" (= Village Administration Office) in a number of _____ meetings/month.



- B. () In Farmer Field in a number of ____ meetings/month.
- C. () In "Gubug Pertemuan" (= Meeting Cottage) in a number of ____ meetings/month.
- D. () In Contact Farmer Houses in a number of ____ meetings/month.
- E. () In other places: _____ (Mention!) in a number of ____ meetings/month.

14. Which place do you prefer as the most appropriate place for conducting farmer group meetings? Why?

Answer:

- A. () "Balai Desa", because: _____.
- B. () Farmer fields, because: _____.
- C. () "Gubug Pertemuan", because: _____.
- D. () Contact farmer houses, because: _____.
- E. () Other places: _____, because: _____.

15. To what extent do you have knowledge about the natural condition of your WKPP (topography, soil condition, potential for farming, etc.)?

Answer:

- A. () To a very great extent.
- B. () To a great extent.
- C. () To a somewhat extent.
- D. () To a small extent.
- E. () To a very small extent.

16. To what extent do you have knowledge about your WKPP as it concerns the social condition of its people (stratification, interaction among groups/classes, custom, land holding systems, etc.)?

Answer:

- A. () To a very great extent.
- B. () To a great extent.

- C. () To a somewhat extent.
- D. () To a small extent.
- E. () To a very small extent.

17. To what extent do you have knowledge of your WKPP as it concerns the agricultural economic systems of its farmers (labor payment, credit, savings, marketing, etc.)?

Answer:

- A. () To a very great extent.
- B. () To a great extent.
- C. () To a somewhat extent.
- D. () To a small extent.
- E. () To a very small extent.

18. To what extent do you have knowledge about your WKPP as it concerns the technical aspects of its farming system (farming technique, kind of seed/fertilizers needed, storage system, etc.)?

Answer:

- A. () To a very great extent.
- B. () To a great extent.
- C. () To a somewhat extent.
- D. () To a small extent.
- E. () To a very small extent.

19. What is your perception about the value of the training given at your REC (= Rural Extension Center) as it deals with the need of continuously improving knowledge & skills of individual FEWs for working with farmers?

Answer:

- A. () Helps in a very great extent.
- B. () Helps in a great extent.
- C. () Helps in a somewhat extent.



- D. () Helps in a small extent.
- E. () Helps in a very small extent.

20.What is your perception about the value of training given at your REC as it deals with the needs for handling farmer complaint or problems?

Answer:

- A. () Helps in a very great extent.
- B. () Helps in a great extent.
- C. () Helps in a somewhat extent.
- D. () Helps in a small extent.
- E. () Helps in a very small extent.

21.What is your perception about the way which your AEOs, SMSs, and other Extension Agents from the higher level handle farmer problems?

Answer:

- A. () Very satisfactory.
- B. () Satisfactory.
- C. () Somewhat satisfactory.
- D. () Unsatisfactory.
- E. () Very unsatisfactory.

22.What is your perception about the local village officer ("Lurah", "Carik", "Kepala Bagian Kemakmuran", "Mantri Tani") in regards to their supports?

Answer:

- A. () They support in a very great extent.
- B. () They support in a great extent.
- C. () They support in a somewhat extent.
- D. () They support in a small extent.
- E. () They support in a very small extent.

APPENDIX A.

(Form 3)

QUESTIONNAIRE FOR EVALUATION

Name of your WILKEL : _____

Name of your WKPP : _____

Your Age : ____ Years. Length of time your have served as a Contact Farmer : ____ Years. Length of time you have been a Contact Farmer Leader of a WILKEL : ____ Years.

Instruction

The following questions should be answered by placing a checking-mark () in the answer which best fits your personal judgment.

1. How appropriate are the recommendations given by uour FEW for your WILKEL as they concern the "Panca-Usaha" and the two additional programs ?

Programs	Very Un- Appropriate 1	Unappropriate 2	Somewhat Appropriate 3	Appropriate 4	Very Appropriate 5
A."Panca-Usaha" :					
1.The Use of High Yielding Seeds.					
2.Water Management.					
3.Method & Rates of Fertiliz- ing.					

APPENDIX A. Form 3 (Continued)

	1	2	3	4	5
4.Pests & Diseases Control Procedure.					
5.Cropping Techniques.					
B.Additional :					
6."Pola-Tanam".					
7."Pasca-Panen".					

2. How many farmers in your WILKEL have adopted the following Panca-Usaha and two additional programs?

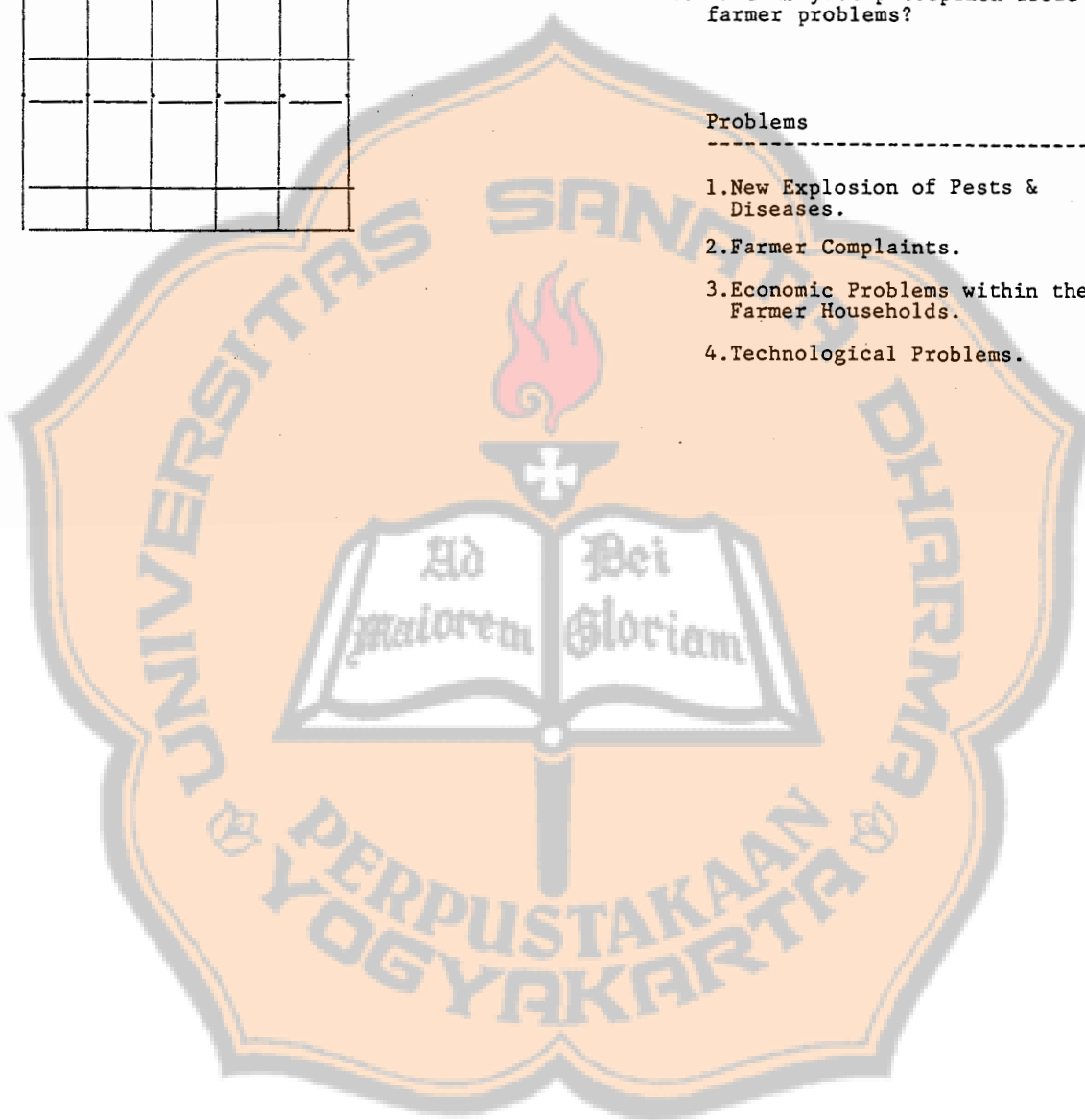
Programs	0-20% 1	21-40% 2	41-60% 3	61-80% 4	81-100% 5
A."Panca-Usaha":					
1.The Use of High Yielding Seeds.					
2.Water-Management.					
3.Method & Rates of Fertilizing.					
4.Pests & Diseases Control Procedure.					
5.Cropping Techniques.					
B.Additional:					
6.Pola-Tanam.					
7.Pasca-Panen.					

3. What is your perceptions about the ability of your FEW for proper identification of farmer problems?

The Problems.	Very Slow 1	Slow 2	Normal 3	Quick 4	Very Quick 5
1.New Explosion of Pests & Diseases.					
2.Farmer Complaints.					
3.Economic Problems within the Farmer Households.					
4.Technological Problems.					
5.Drought, Flood, and Erosion Problems.					
6.Lack of Necessary Knowledge & Skills in Farmers.					
7.Internal Problems of Farmer Groups.					
8.Constraints due to the Farmer Local Customs.					
9.Post-Harvest Problems.					

4. What is your perception about how well your FEW solves farmer problems?

Problems	Very Un-successful 1	Unsuccess-ful 2	Somewhat Success-ful 3	Success-ful 4	Very Success-ful 5
1.New Explosion of Pests & Diseases.					
2.Farmer Complaints.					
3.Economic Problems within the Farmer Households.					
4.Technological Problems.					



APPENDIX A. Form 3 (Continued)

	1	2	3	4	5
5.Drought, Flood, and Erosion Problems.					
6.Lack of Necessary Knowledge & Skills in Farmers.					
7.Internal Problems of Farmer Groups.					
8.Constraints due to the Farmer Local Customs.					
9.Post-Harvest Problems.					

5. What is your perception about farmer groups in your WILKEL as it concerns their abilities to work as group? And to what extent they were influenced by the works of your FEW?

1.Farmer group ability to make plans:

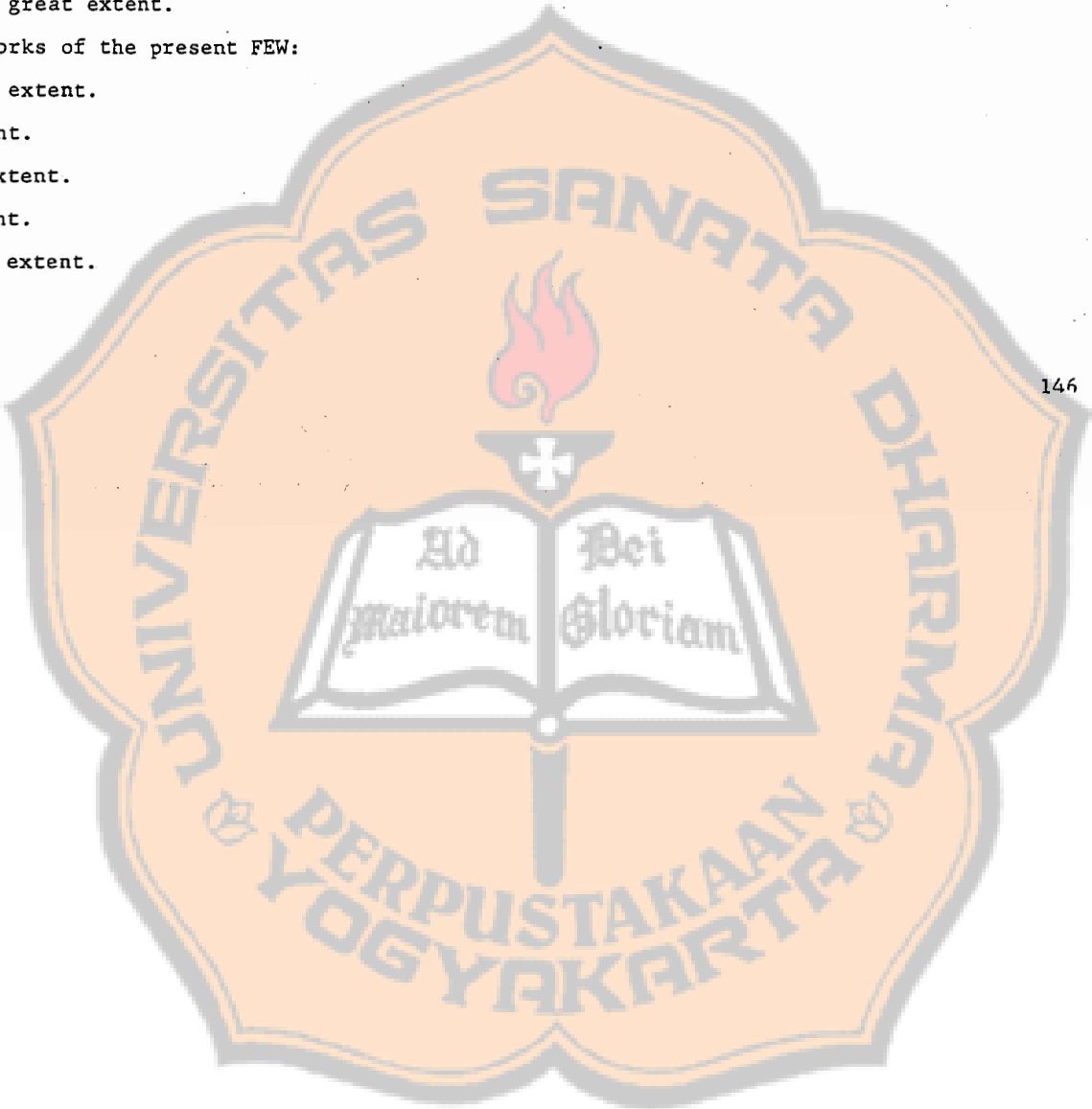
- a. In a condition of:
- A. () Decreasing to a great extent.
 - B. () Decreasing.
 - C. () Constant.
 - D. () Increasing.
 - E. () Increasing to a great extent.

b. Being influenced by the works of the present FEW:

- A. () To a very small extent.
- B. () To a small extent.
- C. () To a somewhat extent.
- D. () To a great extent.
- E. () To a very great extent.

APPENDIX B

RICE PRODUCTION IN DIY



APPENDIX B

RICE PRODUCTION IN THE DIY

Year	Type of Rice	Area of Production (Ha)	Total Production (Ton)	Productivity (Kwl/Ha)
1975	A. Wet Rice (Sawah)	108.666	495.783	45.44
	B. Dry Rice (Gogo)	43.258	71.606	16.55
	C. Total	151.924	565.389	37.21
1976	A. Wet Rice	90.505	421.317	46.78
	B. Dry Rice	42.163	65.884	15.63
	C. Total	132.668	487.201	36.72
1977	A. Wet Rice	87.056	430.238	49.42
	B. Dry Rice	35.953	65.971	18.53
	C. Total	123.009	496.209	40.34
1978	A. Wet Rice	98.184	492.688	50.18
	B. Dry Rice	44.718	68.646	15.35
	C. Total	142.902	561.334	39.28
1979	A. Wet Rice	103.626	394.937	38.11
	B. Dry Rice	16.123	9.626	5.97
	C. Total	119.749	404.563	33.75
1980	A. Wet Rice	104.213	454.427	43.36
	B. Dry Rice	29.752	66.567	22.37
	C. Total	134.565	520.994	38.72
1981	A. Wet Rice	114.110	532.825	46.69
	B. Dry Rice	43.634	92.349	21.19
	C. Total	157.744	625.174	39.64
1982	A. Wet Rice	105.624	542.651	51.38
	B. Dry Rice	41.499	88.226	21.25
	C. Total	147.123	630.877	42.88
1983	A. Wet Rice	107.946	561.712	52.04
	B. Dry Rice	34.083	107.102	31.42
	C. Total	142.029	668.814	47.09
1984	A. Wet Rice	115.449	619.064	53.62
	B. Dry Rice	41.950	129.182	30.79
	C. Total	157.399	748.246	47.54

Source: Dinas Pertanian Tanaman Pangan D.I.Y.

APPENDIX C

FARMER PRODUCTIONS, COST, AND INCOME

PER HA FOR SOME IMPORTANT COM-

MODITIES IN THE DIY

(1981-1984)

APPENDIX C

FARMER PRODUCTION, COST, AND INCOME PER HA FOR
SOME IMPORTANT COMMODITIES IN THE DIY
(1981-1984)

Year	Commodity						
	Rice			Palawija			
	Wet Rice	Dry Rice	Corn	Ground Nut	Soy-Bean	Cassava	Sweet Potatoes
1981	(Rp 1000,-)						
A. Production	680.00	-	204.25	427.50	658.92	526.25	262.50
B. Cost	338.21	-	185.81	303.65	220.00	227.00	189.85
C. Income	341.78	-	18.44	123.85	438.92	339.25	72.65
1982							
A. Production	780.00	300.00	258.00	490.00	666.00	328.00	325.87
B. Cost	395.30	262.35	236.01	318.77	218.85	269.00	233.60
C. Income	384.70	37.65	21.99	171.22	447.15	59.00	92.27
1983							
A. Production	942.50	412.37	269.50	525.00	585.00	337.50	328.50
B. Cost	644.57	376.10	244.75	346.55	247.00	276.00	231.20
C. Income	298.12	36.27	24.75	178.45	337.45	61.50	97.50
1984							
A. Production	754.00	364.00	281.25	600.00	591.50	468.00	302.40
B. Cost	544.45	320.45	248.25	412.50	252.25	377.00	205.00
C. Income	209.55	43.55	33.00	187.50	338.25	91.00	97.50
Annual Increase:							
A. Production	5.18%	12.87%	11.71%	12.01%	4.79%	- 0.86%	5.43%
B. Cost	21.47%	14.28%	10.72%	10.91%	4.99%	19.25%	11.11%
C. Income	- 13.21%	7.66%	21.71%	15.85%	- 7.92%	-10.14%	10.89%

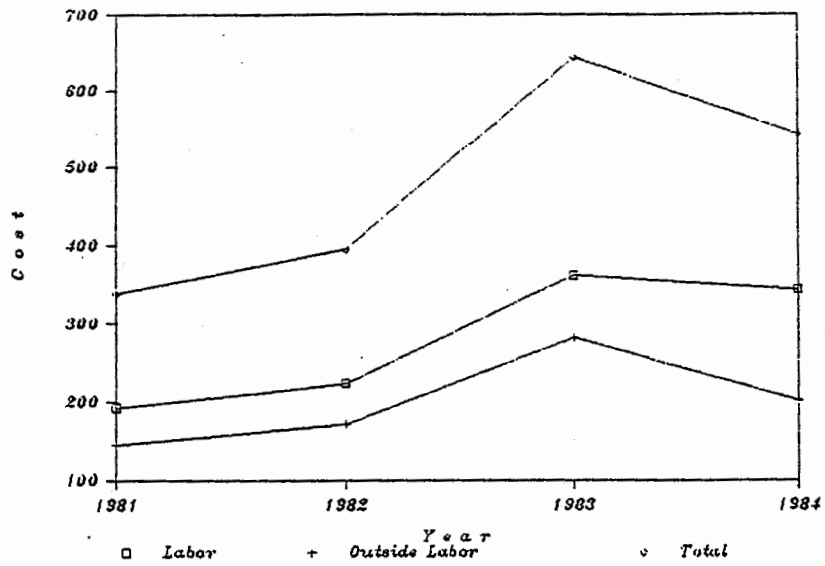
Source: Dinas Pertanian Tanaman Pangan, DIY.

APPENDIX D

PRODUCTION COST FOR 1 HA RICE
FARMING OPERATION

APPENDIX D

PRODUCTION COST FOR 1 HA RICE FARMING OPERATION



APPENDIX E

MAP OF THE DAERAH ISTIMEWA YOGYAKARTA

Type of Cost	1981	1982	1983	1984	Annual Increase (%)
(Rp 1000,-)					
A. Labor	192.78	223.50	362.00	342.95	24.21
B. Outside Labor	145.43	171.80	282.37	201.50	17.95
C. Total	338.21	395.30	644.37	544.45	21.46

Source: Dinas Pertanian Tanaman Pangan
D.I.Y.

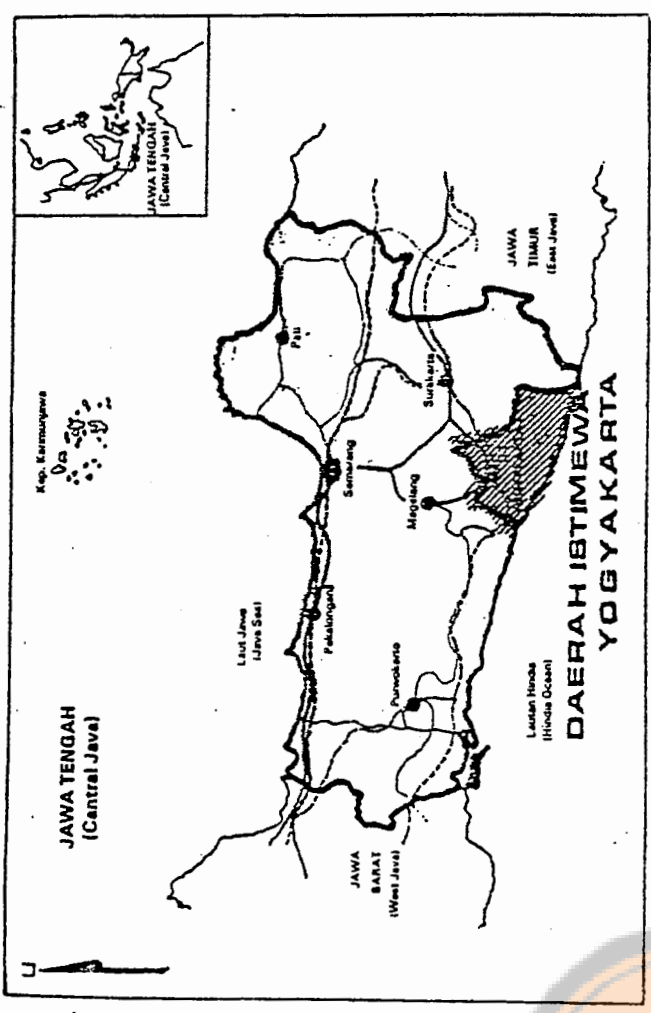


Figure 11. Daerah Istimewa Yogyakarta as Located in Central Java

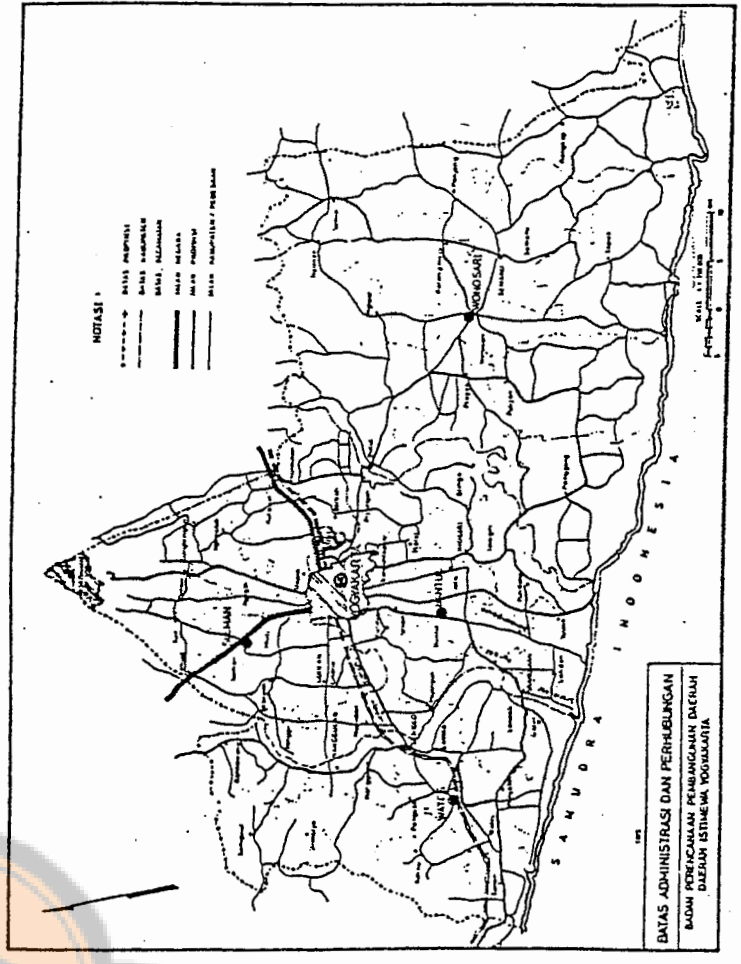


Figure 12. Daerah Istimewa Yogyakarta as a Province

