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A STUDY OF FARM FAMILIES
for
THE EAST JAVA PILOT PROJECT IN AGRICULTURAL COMMUNICATIONS
SECONDARY FOOD CROPS DEVELOPMENT PROJECT

U S A I D
and
DEPARTMENT OF AGRICULTURE REPUBLIC OF INDONESIA

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EXECUTIVE SUMMARY

1. The focus of SFCDP is palawija, secondary food crops, which in Java include the non-rice staples corn and cassava (both used also for other purposes, and cassava for export), other tubers such as sweet potatoes (which are eaten as a snack or vegetable in Java, not as a staple), legumes which are used in a dried state such as soybeans and peanuts, and seeds such as sesame.
2. In terms of socio-economic relationships which affect the practice of agriculture, rural society in Java is probably one of the most complex in the world, to be compared only with, say, India or Bangladesh. The complexity of land-tenure and labor relationships is one example of this. To understand a farmer's motivation and capacity with regard to the adoption of new technology, one needs to know first the family's land tenure and labor situation, and that of their community.
3. This study of farm families was conducted with three aims: (1) to provide information for the Pilot Project in Agricultural Communications so that the project could be tailored to suit local conditions and needs; (2) to provide an introduction to the sample areas in which various studies will continue to be conducted during the period of the pilot project, and in which the pilot project will be monitored; and (3) to design and field-test methodology for the study which could, with appropriate modifications, be applied in other areas of Indonesia.
4. The information collected in this farm family study is of two kinds: first, information directly related to the messages and media which will constitute the pilot project's intervention; and second, information which provides the background for making appropriate choices in that intervention. Examples of the first are cropping patterns, sources of agricultural information, and mass media access and habits; examples of the second are land-holding patterns, educational levels, and occupational patterns.

5. Three areas in the province of East Java were chosen for the study, and then a village chosen within each area. The areas are Wilayah Kerja Balai Penyuluhan Pertanian (WKBPP), Agricultural Extension Center Regions, each consisting of a number of sub-districts. In each of these villages, following collection of preliminary data, a household survey was conducted, case-studies of selected households were undertaken, and focus-group discussions were held. After discussions with Department of Agriculture officials at national, provincial and local levels, and with researchers at MARIF, Malang Research Institute for Foodcrops, potentially suitable WKBPPs for the pilot project's focus were pinpointed. Visits were made to these areas -- several villages in each were visited and farmers were interviewed.
6. A variety of quantitative and qualitative methods were used in the study. A household questionnaire was administered to a purposive sample in each village. Some of these respondents were interviewed again in a less structured, more in-depth interview which we called a case-study. In each village, two focus group discussions were held. A number of other interviews were conducted, of traders in agricultural produce, for example. Finally, observation of village agricultural, geographical, socio-economic and cultural conditions was conducted continuously by the researchers.
7. A questionnaire was designed to be administered in two interviews. For each interview, there was a basic questionnaire plus a series of modules tailored to particular responses in the basic questionnaire -- for example, there was one module for respondents who had never planted high yielding varieties (HYVs) of corn, another for those who had previously but not with the last crop, and another for those whose last crop of corn included an HYV.
8. The questionnaire was field-tested in the village of Pakisjajar over two days. All the researchers participated in the field-test as part of their training, and their interviewing techniques were observed. Following field-testing and discussion of this experience, the questionnaire was revised and refined, and reformatted for easier administration.
9. A case-study interview guide and the list of topics for focus group discussions were developed as the research proceeded and revised to suit the conditions in each village. Except in the case of Ledoktempuro, basic lists of questions and topics for group discussion and case studies were designed along with the questionnaire and planned for late in the visits so that we could make use of our newly acquired information about the village.

10. Research findings are presented in the report. However, a very large body of additional data is available in modular database form for further analysis.
11. Research findings dealing with cultivation practices and factors affecting adaptation of new technology were reported in Chapter Three: A wide variety of ploughing and fertilizing techniques were reported. However fertilizer useage seemed to be far below the recommended level. Pesticide useage varies widely between and within the research villages. A major problem is lack of awareness of how to use pesticides and of pesticide-related health dangers.
12. Adoption of new technology is encountering some problems in the research areas. In Gajahrejo, farmers said that HYVs of corn that were available were poorly suited to local soils and climate. Several farmers had abandoned the use of HYV corn because they found them unprofitable. In Pakisjajar, farmers grow corn mainly to eat and complained that the variety of HYV corn that they had tried did not have a good taste or texture.
13. In at least one research site focus group participants complained that extension agents know less about dry land agriculture and secondary food crops than they do about rice.
14. Many farmers reported a lack of funds to purchase the inputs needed for HYV crops. They are reluctant to go into debt to try new crops and reportedly few of them have any access to government credit for secondary food crops.
15. Research findings related to media and local organizations and how they might be used for promoting new technology is reported in chapter four. Radio and oral messages as part of traditional or modern performances seem to be the most effective medium for agricultural messages. Local languages seem likely to be more effective for reaching farmers than Indonesian. Informal rather than formal, government-sponsored organizations seem to offer more promise for promoting new technology. Messages emphasizing graphics but including short, simple text (e.g. calendars or posters) are more likely to be effective than other kinds of messages.
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INTRODUCTION

THE PROJECT

The Pilot Project in Agricultural Communications is part of the USAID Secondary Food Crops Development Project. SFCDP is a project to increase production of secondary (non-rice) food crops (palawija) and until recently has concentrated on demonstration farms, in six provinces. The Pilot Project in Agricultural Communications is a two-year project with the same overall aim of increasing production of secondary food crops. The objectives are to design and test methods for communicating to farmers new technologies and ways of dealing with agricultural problems, and to determine which of these are more effective in promoting behavior changes. In addition, the Pilot Project attempts to channel information on problems with secondary food crop cultivation at the farm level to decision-makers.

East Java was chosen for the pilot project because of its importance in palawija production, the potential for increases in productivity, and the relative abundance of agricultural research data and of local institutions with whom cooperation would be fruitful.

The study of farm families was conducted with three aims: (1) to provide information for the Pilot Project in Agricultural Communications so that the project could be tailored to suit local conditions and needs; (2) to provide an introduction to the sample areas in which various studies will continue to be conducted during the period of the pilot project, and in which the pilot project will be monitored; and (3) to design and field-test methodology for the study which could, with appropriate modifications, be applied in other areas of Indonesia.

The study aimed to gather information on farmers' experience, perceptions and motivation as a basis for designing appropriate agricultural communications approaches, both messages and media.

Three villages were chosen for the research, on the basis of criteria described below. In each of these villages, following collection of preliminary data, a household survey was conducted, case-studies of selected households were undertaken, and focus-group discussions were held. In addition, local traders were interviewed, and village conditions -- agricultural and socio-economic -- were observed.

RURAL SOCIETY AND AGRICULTURE IN JAVA

Indonesia is a country of 3,000 inhabited islands strung along the Equator for a distance similar to the breadth of the United States. The population is 185 million, consisting of 300 ethnic groups, each with a distinct language. (There are dialects within some of these languages.) The national language, Indonesian, is widely used (though outside the capital, mainly in situations involving people from more than one ethnic group) and is the language of instruction in all schools, but the farther one goes from urban areas, the fewer people one finds who know or are comfortable in the national language. Thus to be effective, communication with farmers generally needs to be in the local language, especially with poorer, older, or female farmers.

Java is an island roughly the size of Louisiana or Ohio with a population of over 100 million. About two-thirds of this population is rural, most of them being involved in agriculture some of the time (multiple occupations are ubiquitous) and a portion of the remaining one-third having some involvement in agriculture (as seasonal laborers or absentee landlords, for instance). Java is divided into three provinces: West, Central and East Java. East Java, where the Pilot Project is being conducted, occupies a little over one third of the island and has a population of about 33 million. There are two major ethnic groups (and languages) in the province, Javanese and Madurese.

Some areas are predominantly Javanese or Madurese, while others are more evenly mixed. There are also the small and localized Tengger ethnic group and settlements of people from other islands.

Cropping patterns in East Java vary from place to place according to physical factors such as altitude, topography, rainfall, irrigation, and soil type, and also according to socio-economic factors such as marketing opportunities, seed or seedling availability, government programs promoting particular crops (sometimes with positive or negative sanctions), and food preferences.

Rice is the most widely grown and consumed staple crop in Java. However, as most rice is grown on sawah -- wet rice fields, either irrigated or rain-fed -- this leaves large areas of upland dry fields (tegalan) which are suited only to dry-land crops. In addition, many wet-rice fields do not receive enough water for year-round cultivation of rice and are planted in other crops once or twice annually.

An alternative to rice cultivation on sawah, and to secondary food crops on dry fields, is sugarcane. This is rarely if ever the crop of choice for small farmers, but, largely because of the government credit program for sugarcane, it is often grown by large landholders on their own or, more often, rented land. There are quotas for area of land under sugarcane cultivation which sometimes lead to pressure being exerted on farmers to put their land under sugarcane cultivation, usually by

renting it to a factory or to larger landholders. Sugarcane takes about a year to mature, and after harvest the roots are usually left in the field for several ratooning crops. It is a major enterprise to convert fields to sugar cultivation, and back again.

The focus of SFCDP is palawija, secondary food crops, which in Java include the non-rice staples corn and cassava (both used also for other purposes, and cassava for export), other tubers such as sweet potatoes (which are eaten as a snack or vegetable in Java, not as a staple), legumes which are used in a dried state such as soybeans and peanuts, and seeds such as sesame. Not included are sugar, vegetables, spices and herbs, fruit, or any other tree or vine crops. The classification is related more to historical factors and the structure of the Indonesian Department of Agriculture than to current farming patterns or botanical classification.

According to statistics, in 1985 East Java produced 39% of Indonesia's corn production, 43% of soybeans, and 27% of cassava.

In the pilot project, the focus is on upland areas where most agricultural land is dry fields, as these are the areas seen, Indonesia-wide, as having the most potential for increased production of secondary food crops.

In terms of socio-economic relationships which affect the practice of agriculture, rural society in Java is probably one of

the most complex in the world, to be compared only with, say, India or Bangladesh. The complexity of land-tenure and labor relationships is one example of this. To understand a farmer's motivation and capacity with regard to the adoption of new technology, one needs to know first the family's land tenure and labor situation, and that of their community.

Common practices include: renting, for one season by poorer farmers or for several years by wealthy landowners or urban-dwellers; pawning, by owners in urgent need of money; poor farmers who rent out or pawn their land to wealthier ones may in fact still cultivate the land on a share-cropping basis; share-cropping, there being any number of possible ways of splitting the costs, and several of sharing the harvest (maro, mertelu, mrapat): share-cropping may involve a patron-client relationship; a cross between share-cropping and contract labor (kedokan or pajekan), in which the worker, who usually pays for none of the inputs, receives a small share of the harvest; harvesting practices whereby harvesters receive varying shares of what they harvest depending on their relationship to the land-holder, on whether or not they planted or weeded, on whether or not they offer harvesting opportunities in return, and so on. Land-tenure and harvesting arrangements may vary from season to season and/or crop to crop. A farmer may share-crop out a piece of land which is distant or infertile, and share-crop in another piece of land. These practices all vary from village to village and seem to be changing rapidly. In several cases we asked about a particular

practice in a village and were told it is now rare but used to be more common, or that it is rare in that village but occurs in other villages nearby where conditions differ.

A notable characteristic of rural Java is the great variation found over both large and small areas. Among villages within one sub-district, there may be marked differences in, for example, agricultural practices, adoption of new technology, labor relations, sexual division of labor, land-holding patterns and terms, social and economic relationships among neighbors, and relationships between the village elite (which includes village officials) and ordinary people. There may even be marked variation among hamlets in one village. In East Java, the presence of two major ethnic groups adds to the diversity.

CHOICE OF RESEARCH AREAS

Three areas were chosen for the study, and then a village chosen within each area. The areas are Wilayah Kerja Balai Penyuluhan Pertanian (WKBPP), Agricultural Extension Center Regions, each consisting of a number of sub-districts.

The WKBPPs and the study villages were chosen on the basis of a number of criteria, determined in conjunction with the Department of Agriculture in Jakarta:

- Centers of secondary food crop production with potential for increased production.
- One village isolated, with poor access to markets and information, and another close to a major town with good communications.
- One village with problems such as poor soil and inadequate water for agriculture, another with better agricultural conditions.
- Representing more than one major secondary food crop. Those chosen were corn, soybeans and cassava.
- Upland, with large areas of dry fields planted in the above crops at least once a year. (Sawah planted in these crops was also of interest.) In particular, soybeans should be grown on dry fields rather than sawah, as anticipated areas of expansion of soybean cultivation in other islands are upland, dryland areas.
- Areas where agricultural research institutions in Malang are carrying out research, so that technical agricultural data is available for use in the pilot project.
- Representing as much of the diversity of East Java as possible, yet within reasonably easy reach of the pilot project headquarters in the town of Malang, to enable frequent visits to be made for further study and monitoring during the period of the pilot project.

RESEARCH METHODOLOGY

The information collected in the farm family study is of two kinds: first, information directly related to the messages and media which will constitute the pilot project's intervention; and second, information which provides the background for making appropriate choices in that intervention. Examples of the first are cropping patterns, sources of agricultural information, and mass media access and habits; examples of the second are land-holding patterns, educational levels, and occupational patterns.

A variety of quantitative and qualitative methods were used in the study. A household questionnaire was administered to a purposive sample in each village. Some of these respondents were interviewed again in a less structured, more in-depth interview which we called a case-study. In each village, two focus group discussions were held. A number of other interviews were conducted, of traders in agricultural produce, for example. Finally, observation of village agricultural, geographical, socio-economic and cultural conditions was conducted continuously by the researchers.

It was decided that an attempt would be made to find experienced researchers with whom to work on the study, rather than training enumerators, as it was hoped that researchers working on the study would participate in all aspects of it and time did not permit extensive training in methods. Pusat Pengembangan Ilmu-Ilmu Sosial (PPIIS), the Center for Development of the Social Sciences, at Brawijaya University in Malang was recommended and, after discussing with the Director (I Nyoman Nurjaya) the Center's experience, our needs, and what they could provide, as well as looking into their past research, we reached an agreement with PPIIS to work together. They provided five part-time researchers, all of whom are lecturers at the University, two of them in senior positions. All the faculty members involved in the Center have social science research experience in the Center's longitudinal "laboratory village" research project. The researchers who worked with us were from the animal husbandry and law faculties: the university does not have a social science faculty but does have socio-economic studies departments within other faculties.

Unfortunately, none of the women associated with the Center were available to participate. It would have been preferable to have some other female researchers besides myself as the study called for interviewing of both men and women -- women tend to respond better to female interviewers, especially when the respondent is on her own. Pairs of female and male interviewers

would probably be the best arrangement. Had we had at least one Javanese female researcher, a focus group discussion with women would have been feasible.

As the researchers are full-time lecturers, the field schedule had to be adjusted to their availability. They rescheduled classes, in some cases, so that in most cases four of the five were available Thursday morning through Saturday evening for overnight field trips, and on other afternoons and evenings for visits to the nearest research site. The two senior researchers alternated, as one had to stay at the Center.

In the original research plan, all the research was to be conducted in Javanese, with villages being chosen in which most of the population was Javanese-speaking. The reason for this was that we felt that with the time and resources available, we should concentrate on speakers of one language. Also, while initially one Madurese researcher was to be working with us, he left to do a graduate degree. When the decision was made to include a village in a Madurese-speaking area, interpreters (Madurese-Indonesian) had to be found. The two interpreters were also lecturers at the university, and had some research experience.

PPIIS was consulted in the planning of the research and formulation of the questionnaire. The Center was responsible for the translation of the Indonesian draft questionnaire into Javanese, and later, of the Javanese questionnaire into Madurese. Translation was outside the contract. The PPIIS researchers

wrote up their notes from focus group discussions and case-study interviews in report form (in Indonesian). In addition, recordings of the focus group discussions were transcribed, and some have been translated into Indonesian.

THE RESEARCH PROCESS

Preliminary Visits

After discussions with Department of Agriculture officials at national, provincial and local levels, and with researchers at MARIF, Malang Research Institute for Foodcrops, potentially suitable WKBPPs for the pilot project's focus were pinpointed. Visits were made to these areas -- several villages in each were visited and farmers were interviewed. The purpose of these preliminary visits was to establish the suitability of the WKBPPs as sites for the pilot project, to choose villages for the farm families study, and to collect as much information as possible so as to tailor the research to the areas under study. /On most of these visits we were accompanied by agricultural researchers from MARIF and by some of the PPIIS people who were working with us.

Selection of Research Sites

Pagak WKBPP is on the south coast of the district

(kabupaten) of Malang. This is hilly limestone country, dry and with low soil fertility. It is relatively isolated in terms of access to large towns, markets, and government facilities such as senior high schools. We selected Gajahrejo, one of the more isolated villages (desa) in the area, in the southeast corner, in Gedangan sub-district (kecamatan). The village extends southwards from the sub-district capital (a small market and administrative center within a village) to the sea. Many parts of the village are accessible only by foot, though there are dirt roads -- one of which is currently being surfaced -- which run through the village. Because of the terrain, even bicycles are of little or no use to reach some parts.

Javanese villages consist of a number of hamlets (dukuh in Javanese, dusun in Indonesian). In each village, although we interviewed people from other hamlets, we chose one hamlet, usually the one with the most dry fields and/or the most secondary food crops, on which to concentrate. In Gajahrejo, the hamlet chosen was Sumberlele, the middle hamlet of three. Nearly half the dry fields in the village are in this hamlet. Sumberlele is 10 km from the sub-district capital, and about 80 km. by road from the city of Malang.

Tumpang WKBPP is also in the district of Malang and borders on the city of Malang. We chose the village of Pakisjajar, which is in the nearest subdistrict to Malang, Pakis. The subdistrict offices and market are in this village -- the "town" area is partly in Pakisjajar and partly in the next village. It should

be noted that the majority of subdistrict towns in Java are small market and government centers within a village (or overlapping villages). While a small percentage of the population draws its income solely from trade or a government position, most, including many non-Chinese traders and some civil servants, are engaged in agriculture. Pakisjajar was chosen for its proximity and easy access to Malang. The hamlet selected was Krajan, the closest to Malang and the hamlet in which the market and subdistrict offices are located. The village hall is also in Krajan. Krajan is one of two hamlets in which corn is commonly grown. There are unofficially four and officially three hamlets (two are combined for administrative purposes).

The third area was to be a soybean-growing area. The original selection was Pasuruan district, north of Malang towards the provincial capital, Surabaya. In Pasuruan, most soybeans are grown on wet-rice fields, either in the dry season or year-round. In the village we chose, they were grown year-round. Our research was to occur shortly before harvest-time, which would have meant that details of the crop were still fresh in farmers' minds. We had discussed various possible districts, rejecting some because of distance from Malang, and others (including Lumajang) because the population is largely Madurese-speaking.

Subsequently, the Project Leader from the Department of Agriculture expressed concern that we had chosen a village where soybeans were grown on irrigated rather than dry land. The Department is hoping to extend soybean production on dry fields

in other parts of Indonesia, and therefore it was considered preferable for the research and pilot project to be in a dry-field rather than a sawah area.

Lumajang seemed to be the only relatively nearby district where soybeans are extensively grown on dry land. After a preliminary visit, plans were changed to include Wonorejo WKBPP in Pasuruan. Several problems were associated with this shift.

These included:

1. Language:

- We had to translate the research instruments into Madurese, and then to revise them to bring them into line with the revised Javanese version.

- As all our researchers were Javanese speakers, we had to look for Madurese who could act as either researchers, in pairs with our more experienced Javanese researchers, or, much less desirably, interpreters. The two people found performed a role somewhere between interpreters and researchers. The language problem placed severe limitations on what we could achieve. Also, whereas I speak Javanese and thus could monitor and participate in proceedings and check translations, I could not do this with Madurese, nor did I have access to anyone with extensive (or even significant) Madurese research experience.¹

¹ The University of Jember has a Madurese studies department.

2. Cropping patterns:

In Lumajang, farmers only plant soybeans in the rainy season. This meant, firstly, that we were asking farmers about a crop they had harvested seven months previously-- far too long ago to expect recall of details -- and secondly, that the research instruments needed revision to deal with this situation.

3. Distance:

The research area is well over three times as far from Malang as the one previously chosen in Pasuruan. Thus, while each step of the research took longer than in the Javanese speaking areas, we had only half the time there as only one visit of three days was possible.

Distance and language will pose similar problems with implementation of the pilot project.

The village selected was Ledoktempuro, in the subdistrict of Randuagung. This village is neither isolated nor near a large town. It is situated on a main road, and the selected hamlet, Coratekor, is about 3 km. from the sub-district town. It is about 25 km. from the district capital, Lumajang. Coratekor has only dry fields, no wet rice land. The other three (official) hamlets have some sawah as well as dry land. (There are five traditional divisions.) Corn is the other important secondary food crop grown in the village.

Cassava is another secondary food crop commonly grown in all three villages. It is of particular importance in Gajahrejo, being a crop which grows well on poor soil.

Design of Research Instruments

The Household Questionnaire. The first draft of this instrument was in Indonesian. It was then translated into Javanese and revised several times, before and after field-testing, in that language. A Madurese translation was done before many of the revisions were made to the Javanese version. This necessitated a second translation being done of the final Javanese version -- revising the earlier translation would have been much more difficult.²

The questionnaire was designed to be administered in two interviews. For each interview, there was a basic questionnaire plus a series of modules tailored to particular responses in the basic questionnaire -- for example, there was one module for respondents who had never planted high yielding varieties (HYVs) of corn, another for those who had previously but not with the last crop, and another for those whose last crop of corn included an HYV.

² The final Madurese translation was typed directly onto the computer, overwriting the Javanese version. Thus identical formatting was achieved with little effort. The translator worked with a computer operator who also knew both languages.

The questions fall into a number of categories: in the first interview: characteristics of the household (size, composition); characteristics of individuals (occupations, education etc.); indicators of socio-economic status (house, possessions, land holdings); type of land; details of land-holding terms; and details of crops grown over three planting seasons (not counting fallow periods). In the second interview: radio listening and TV watching habits; movie-going; literacy and reading; languages; plans for the next crop; agricultural problems; use of labor in agriculture; land tax paid; acquaintance with agricultural extension agents; participation in organizations and gatherings; details of varieties of corn and soybeans, inputs used, and problems; details of marketing and consumption; and capacity to purchase inputs and use of credit.

The questionnaire was designed with the following considerations in mind: what information was directly needed to plan the pilot project interventions; what information was necessary to make that information meaningful, to place it in context; the time available; which questions were better asked in a focus group or less-structured interview context; information gathered in preliminary visits to the villages; and information from discussions with agricultural researchers from MARIF and with local Department of Agriculture personnel.

The questionnaire was checked for agricultural terminology and local language usage by a junior agriculturalist from MARIF who works in Pagak WKBPP.

The questionnaire was field-tested in Pakisjajar over two days. All the researchers participated in the field-test as part of their training, and their interviewing techniques were observed. Following field-testing and discussion of this experience, the questionnaire was revised and refined, and reformatted for easier administration.

The case-study interview guide and the list of topics for focus group discussions were developed as the research proceeded and revised to suit the conditions in each village. Basic lists of questions and topics for these were designed along with the questionnaire, then, as except in the case of Ledoktempuro the focus group discussions and case studies were planned for late in the visits so that we already knew quite a lot about the village, information was available to further adapt these guides to what we needed to explore further in that particular village.

The Case-Study Interview Guide. This was intended to address questions: for which answers from a small number of respondents would suffice; which were better explored in a less structured setting than the questionnaire interviews; which arose from the questionnaire interviews and needed further exploration; or which were sensitive and were best left to a third, informal interview with selected respondents. In addition, there were one or two questions which would ideally have been on the questionnaire but were not thought of in time for inclusion.

A fairly extensive list of topics was compiled. It was not expected that all topics would be covered with each family, as frequently respondents would wish to talk at length on particular topics, and this was encouraged if the topic was relevant. Certain questions were intended to be asked of all case-study respondents.

The Focus Group Discussion Guide. Topics for discussion by focus groups were: questions relating to the hamlet or village as a whole; matters with which there was not likely to be much individual variation; matters where we wanted to find out more about variation and the reasons for it; and certain questions which were also asked in the questionnaire or case-studies, about which we wanted more information.

The advantages of focus group discussions are that a large amount of information from a number of people can be obtained in a short period, that comments made by one person can jog the memory of another, that mistakes made by one participant can be corrected by another, that points of disagreement can be observed, that unanticipated information may be forthcoming, and that if organized well, the discussion can be a relaxed and enjoyable social occasion for participants. Focus groups are not a good source of information on personal, sensitive issues or on matters which people are likely to misrepresent to friends and neighbors.

Field Research

The plan was for visits of the equivalent of six days full-time to each village. In the case of Gajahrejo, the researchers spent three days each of two consecutive weeks in the village, staying in a house in Sumberlele. With Pakisjajar, researchers did not stay the night but made numerous visits to the village, usually afternoon and evening when people were likely to be at home.³ As mentioned above, because of the distance to Ledoktempuro, only one visit of three days was possible. Again, we stayed in a house in the hamlet.

As far as possible, interviews were timed so as not to inconvenience respondents. For example, times when most people were in their fields were avoided, and in Pakisjajar we did not visit on Thursday evening, when most people were busy with mosque-related activities such as tahlilan. The first interview was usually conducted on the first visit, unless the respondents were busy. An appointment was made for the second interview. Focus group discussions were almost all held in the evenings. A suitable time was established by discussion with the villagers concerned.

³ From my experience, it is always better for researchers to stay in the village if this is feasible. Pressure of time and other activities of the PPIIS researchers meant that we opted for a less desirable alternative.

Questionnaire and case-study interviews were conducted in the respondents' houses. The aim was to have both husband and wife as respondents except in the case of respondents with no spouse (virtually always women). In a number of cases both were not present because one was out. Women usually preferred their husbands to be present so absent spouses tended to be the wives. Time did not permit re-scheduling interviews to ensure the presence of both. There were many cases where interviewers waited for quite long periods for respondents to come home, and they occasionally went to look for them.

The time taken for questionnaire interviews varied considerably, depending on such factors as the number of blocks of land worked and whether the respondents listen to the radio. Researchers were asked to encourage additional comments arising from questions and to note down these as well as other relevant comments. Some respondents were hard to keep on the track. In Gajahrejo, respondents in a number of cases insisted on feeding the interviewers! Interviews averaged one to one and a half hours.

Respondents were given a small china plate as a token of appreciation.

Focus group discussions were, where possible, organized after we had a "feel" for the village and had met a number of people. We tended to approach a respondent who seemed suitable to be the host for the gathering, though there would have been advantages too in choosing someone other than a respondent as

this would have given us access to more people in total. However, it seemed best, with the time available, to make use of established contacts. The host was asked to invite about eight to ten people he knew -- the intention being to have a fairly homogeneous group who would be at ease with each other. In fact many more people than this always came! All the groups were male, though women sat or stood on the outskirts. We had hoped to organize at least one group of women, who are involved in agriculture about to the same extent as men, but this was made difficult by having no female researchers from PPIIS. In each village, we tried to arrange one focus group with a few village officials and other elite, and another with ordinary farmers. In some cases we had one or two elite farmers along with the others, and the groups were still successful, but in Ledoktempuro, where we had little or no control over the arrangements, there was a very unsuccessful, markedly heterogeneous group where only two people talked the entire evening and the rest sat frozen silent! This was conducted in Madurese so we were relying on interpreters, though there was some discussion in Indonesian which effectively excluded many participants.

We provided refreshments for the gatherings. In most cases participants sat on mats on the floor in a circle -- several researchers and the villagers. One or two researchers took notes and the others asked questions and raised topics, with one taking the major responsibility. One of our researchers was especially

skilled at getting the discussion underway, guiding it, and involving everyone in the discussion. After an initial question was raised, other questions on the guide were introduced as related matters came up -- there was no set order.

Samples

A decision was made to have a small sample and interview respondents in greater depth. The aim was to have a sample of fifty for the questionnaire, eighteen from each of the Javanese-speaking villages and fourteen from the Madurese-speaking one. This target was achieved for Gajahrejo, and exceeded by three for Pakisjajar. In Ledoktempuro only eight were possible. Two additional first interviews were conducted but the respondents were not available for the second (one was in Ledoktempuro and the other in Pakisjajar). Thus the total sample for the questionnaire was forty-seven.

The sample was purposive, not random: respondents with particular characteristics were sought in certain proportions. Basically, respondents were divided into three categories: wealthy, medium and poor farmers. Within these categories, respondents were sought who fell into various land-holding categories such as renting out or in and sharecropping out or in. Female heads of households were included as well as male. Traders in agricultural produce were also sought, though I interviewed some of these people rather than having them as questionnaire respondents.

The sample for case-studies was chosen from the questionnaire respondents in Gajahrejo and Pakisjajar. No case-studies were attempted in Ledoktempuro. Four case-studies were done in each of the two villages, by the researcher who did the original interviews except in one or two cases where this was impossible. The case-study families were chosen after the first two interviews had taken place. Respondents were chosen, where possible, who represented various of the above categories, and in particular any categories which seemed of particular significance in that village. The most important criteria for selection of people for case-studies, however, were their openness, interest in talking to the interviewers about the topics under research, and to some degree their ability to express themselves.

Other Research Methods Used

Observation. We walked around the villages a lot, both to reach respondents' houses and for the purpose of observation alone. We stayed in village houses, and of course visited many others. We observed agricultural practices and ecological conditions, as well as road access and settlement patterns. Observation of houses provided an indicator of socio-economic status.

Interviews. In addition to the questionnaire and case-study interviews, a number of other interviews were conducted. Some of these were planned, others ad hoc -- we met people working in their fields or sitting outside a shop, for example, and asked them questions.⁴

Planned interviews were of traders in agricultural products and of shopowners who sold agricultural inputs -- in some cases overlapping -- and of village officials.

Problems in the Field

The main problem in Gajahrejo was the distances between houses. Typically, in a Javanese hamlet, houses are clustered together or strung along a road, with fields surrounding the cluster of houses. In Gajahrejo, however, houses were scattered over a large area -- sometimes in small groups -- interspersed with agricultural land and some barren areas. The researchers would ask someone where so-and-so lived and be told: "That way, over the third hill"! or: "See, its that house you can see there" (over the other side of a valley)! These sorts of directions became quite a joke among the researchers. A lot of time was spent in walking -- with some risk of getting lost at night!

⁴ Had more time or personnel been available, we would have visited respondents' fields with them and observed and discussed agricultural conditions and practices at the site.

In Gajahrejo, people were always able to give directions to another's house. The same was generally true in Ledoktempuro. In Pakisjajar this was not the case -- researchers in many cases had considerable difficulty in finding houses, as people were unable or unwilling to give directions. This was despite the fact that houses were clustered together.

A second problem in Pakisjajar was that some respondents were suspicious of the researchers (presumably of outsiders in general), very cautious in their replies, and unwilling to express opinions. Some people refused or avoided being interviewed, and others were reluctant to be interviewed a second time. This was in marked contrast to the other two villages.

Apart from the language, there were no particular problems in Ledoktempuro. The hamlet is somewhat scattered, having small rows of houses separated by fields, so there was quite a lot of walking to be done, but it was largely level and straightforward.

RESEARCH FINDINGS

THE VILLAGES

Gajahrejo

The village of Gajahrejo has an area of 989 hectares or 9.69 sq. km. and a population of about 4,000, giving it a population density of 413 persons per square kilometer. Sumberlele hamlet has an area of 3.96 sq. km. and a population of around 1,770, a density of 447 persons per square kilometer. The village has 775 hectares of dry fields (tegalan and kebun) and only 50 ha. of sawah, wet rice fields. Sumberlele has 346 ha. of dry fields and 10 ha. of sawah. All the village sawah is rain-fed, that is, it does not have irrigation canals bringing water to fields. Much of the land is rocky and/or stony. Some of the village land, mainly on hilltops and steep hillsides, is no longer cultivable because of erosion. Interestingly, we were told that some farmers are purchasing this badly eroded land cheaply and rehabilitating it by first applying manure, and later planting trees. It may later be possible to plant annual crops between the trees, which hold the soil in place with their roots and fertilize and protect the soil with fallen leaves. On the other hand, we were also told that in cases of badly depleted and

eroded soil, landowners may cut down any trees there are to make a little money from the land before abandoning it.

The dry fields, as well as sawah, are mostly terraced, which helps protect the soil.

The village is bordered on the west by forest, some of which is within the village, on the east by a river, and on the south by the ocean. The terrain is very hilly, limestone hills. Many terraces are thus very narrow. The rivers -- there are two others -- are small and in the dry season, when we were there, very low. There are also some springs used for drinking and cooking. Water from some of these springs was being rationed when we first visited. While the southern end of the village is at sea-level, the northern end is reported to be 389 m. above sea-level.

A very minor (village) road from the subdistrict town runs north to south through the village and there are a few other dirt roads but most of the village is served only by tracks which cross valleys and streams and climb over hills.

The village hall and village head's and secretary's houses are in the northernmost hamlet, Krajan. They are several kilometers north of the house of the head of Sumberlele hamlet, where we stayed. Most of the hamlet extends to the south. The southernmost hamlet, Bajulmati, borders on the sea.

Most of the population of the village are Javanese. A small number are Madurese who have lived there for generations. Some have intermarried with Javanese. Most Madurese here speak

Javanese as well as Madurese, though an interviewer had difficulty with one respondent.

We found Sumberlele to be a close-knit community. As mentioned previously, people knew each other, though the information given about other farmers' landholdings was often far from accurate. The researchers received the impression that relations between village officials and ordinary villagers were good, and that officials are in touch with village conditions. The village, especially the two southern hamlets, do not have a lot of contact with the outside world. They would appear to have few visits from government officials, because of distances and lack of roads. Probably the rarity of visitors contributed to the friendliness and openness towards the researchers. Some villages experience frequent government visits which are not always perceived as beneficial and may sometimes be experienced as a burden.

Pakisjajar

Pakisjajar occupies an area of 501 hectares or 5 sq. km. The population is about 5,140. The population density is 1028 per sq. km. We were not able to obtain a breakdown by hamlet. The village has 288 ha. of dry fields and 83 ha. of sawah. All the sawah, we were told, is in the hamlet we studied, Krajan.

This village, while agricultural, has much more urban influence and character than does Gajahrejo. The subdistrict

market and shops are situated in the village, and it is only about 15 km. from the center of Malang, with frequent public transport. There is a paved road running through Pakisjajar and dirt roads, many of which are well-maintained, to other parts of the village. Houses are mostly reached along fairly level roads or paths. Some houses have electricity.

This village is somewhat higher up than Gajahrejo, in the vicinity of 400-500 m. above sea-level, on the lower slopes of the Mt. Bromo/Mt. Semeru range.

Villagers would appear to have had negative experiences with outsiders, leading to the suspicion that researchers encountered. We heard that there had recently been a deal over a public housing development (presumably for people from Malang) involving at least one village official, which resulted in villagers receiving much less than market value for land they were forced to sell. We felt that there had probably been other problems over many years.

Village officials, in contrast with Gajahrejo, tended not to know much about villagers. There is no village head at the moment -- the acting village head is a subdistrict civil servant.

Ledoktempuro

This village has an area of 3.06 sq. km. and a population of about 3480, a population density of 1137 persons per square kilometer. The hamlet of Coratekor has an area of 62 ha. and a

population of about 861, a population density of 1389 persons per sq. km.

Ledoktempuro is around 100-200 m. above sea-level. The terrain is fairly level in Coratekor.

The village has reasonable access to the outside, falling between the other two villages in accessibility. A fairly major road runs through the middle of the village. Many houses are reached by paths which are also suitable for bicycles and motorcycles.

Village officials were able to provide us with information about other villagers. Respondents were open and ready to talk with researchers, allaying concerns that a Madurese village might be less accessible than the Javanese ones. We were able to interview a wealthy trader/farmer, a shopkeeper, and village officials in Indonesian but the other interviews all had to be conducted in Madurese.

THE RESPONDENTS

The Households

Average household size was six for Gajahrejo and five for Pakisjajar and Ledoktempuro. In Gajahrejo, fifteen of the households had a male head and as is almost universal, they all had wives. There were three female heads of households. In

Pakisjajar, there were twenty male and one female head, and in Ledoktempuro, eight and zero.

The average age of male and female householders (i.e. husbands and wives/female household heads) in Gajahrejo was 26 and 31 respectively; in Pakisjajar, 45 and 38; and in Ledoktempuro, 39 and 36. (These ages are probably underestimated.) The average age of the oldest child living at home was 12, 14 and 20 respectively.

Male householders had an average of 2 years schooling in Gajahrejo and 4 and 1 in Pakisjajar and Ledoktempuro. Female householders averaged 2, 3 and 2. The oldest children living at home (many still in school) averaged 4, 5 and 8 years. There has been a big rise in educational levels in Indonesia over the last generation.

In Gajahrejo, one of the respondents was a village official, and in Pakisjajar and Ledoktempuro, four and three. Most of them were minor officials, mostly neighborhood (R.T.) heads. There were (purposely) no village heads, secretaries, or other important officials.

Possessions

These are indicators of socio-economic status.

Housing materials are a useful indicator, with some exceptions especially in cases of old people who have given their house to a married child and live in a poorer quality one.

Wealthy people usually have brick houses and sometimes good-quality timber. The poorest have woven bamboo. In between, there are timber and various combinations of bamboo, timber, brick, and recently, three-ply. The front walls of houses were as follows. Frequently, side and back walls are of poorer quality materials. The data-base contains more information on housing. In the table below, the materials are arranged more or less in order of quality, from lower to higher.

	Gajahrejo	Pakisjajar	Ledok-tempuro
Materials			
Bamboo	0	1	0
Bamboo and 3-ply	4	7	4
Bamboo and timber	10	7	2
Bamboo with brick base	4	5	1
Timber	0	0	1

Few households had vehicles. In Gajahrejo, two had bicycles. In Pakisjajar -- where the terrain is suited to bicycles -- all but three had them, and three had two each. In Ledoktempuro, all but one had bicycles, two each. In Ledoktempuro in particular, they are used for carrying stockfeed such as sugarcane tops and corn plants long distances home. No respondent households in Gajahrejo had any other vehicles. In Pakisjajar, two had motorbikes, and one in Ledoktempuro. In

Ledoktempuro, one respondent, Sutahi, had four trucks, four small pick-up trucks, and a mini-bus (stasion).

Livestock

Patterns of livestock ownership varied from village to village. All kinds of livestock, including chickens, are used as a form of savings or investment. In addition, cattle and water buffalo are used to pull ploughs. Below are figures for cattle, goats and sheep. There were very few water buffalo, which are usually used in sawah. A = number of respondents owning any, and B, the average number owned by those owning any.

	Gajahrejo		Pakisjajar		Ledoktempuro	
	A	B	A	B	A	B
Cattle	14	1.9	9	2	8	1.4
Goats and sheep	3	2	0	0	2	2

Landholdings

Land ownership is the best indicator of socioeconomic status in Javanese villages. However, is virtually impossible (short of measuring fields) to obtain accurate information on size of landholdings, as many farmers do not know the area exactly or at

all, or describe it in units which are not convertible into hectares -- for instance, "sekesuk", a morning up to about 10 or 11 a.m., refers to an area of land that can be ploughed in that time. It varies according to terrain and other variables. Large landowners often (and others sometimes) do not wish to disclose the extent of their holdings.

As an indicator of landownership, we asked how much land-tax (P.B.B.) respondents paid. While tax due does not always indicate accurately how much land people own (for example, land passed from parents to children may remain in the parent's name, with either paying it; people with more land than allowed by law may find ways of getting around this in land registration), it is in my experience a useful short-cut method of comparing land ownership.¹

Gajahrejo. Only one of the respondents owned any sawah. They all owned dry fields (tegalan), an average of 1.8 blocks of per household. Tax paid ranged from Rp 500 to Rp 22,000. One of the respondents responded with no tax paid despite owning land: this could mean someone else pays the tax, or it could be a mistake. The average excluding the zero is Rp 5,542. The average for the 14 respondents whose tax was less than Rp 10,000,

¹ The tax rate is different for different categories of land -- higher for better agricultural land -- so it is not a method of finding out exactly how much land people have, though can be estimated where something is known about land classes in a village.

however, was only Rp. 2,646.

There were no renters and only one sharecropper (the kedokan system) in the sample. Renting seems to be rare in Gajahrejo. Sharecropping is more common, we were told, but it was hard to find respondents who were sharecroppers.

Pakisjajar. Eight respondents owned sawah. All owned dry fields, averaging 1.4 blocks per household. Tax paid ranged from Rp 250 to Rp 15,000. There were two cases of zero, one of whom had land and the other not. The average excluding one zero is Rp 5,132. The average for the 14 respondents whose tax was less than Rp 10,000 was only Rp 1,643.

One respondent rented sawah and four rented dry fields. There was one sharecropper of sawah and one of dry fields on the 1:1 basis (maro) and one sharecropper of dry fields on the kedokan system. We were told that sharecropping was much more common in the past but that landowners have tended to prefer to work their land themselves since new technology has become available -- presumably because there is more opportunity for profit. Landowners whose land is sharecropped have always mostly been large landowners.

Ledoktempuro. Two respondents owned sawah and all but one owned dry fields, an average of 1.9 blocks per household. Tax paid ranged from Rp 600 to Rp 20,000. The average was Rp 3,975. The average for the 7 respondents whose tax was less than Rp 10,000 was only Rp 1,688.

One respondent rented both sawah and dry fields. There was one sawah sharecropper and one dry field sharecropper, both kedokan.

CROPPING PATTERNS

Corn is a major crop in all three areas. It is often intercropped (tumpanghari) with other crops, mainly cassava in the villages we studied. Cassava is grown in all three areas too, but is of particular importance both as a cash crop and as a staple in Gajahrejo. Corn is grown for both purposes too, but in Gajahrejo is almost entirely a subsistence crop. In Gajahrejo and Pakisjajar, corn may be grown all year round on dry fields, if there is enough water, though in Gajahrejo land is frequently occupied by cassava part of the year. In Ledoktempuro, one or two crops of corn are grown in the dry season, with soybeans being grown in the wet season.

Cassava is commonly intercropped with other crops. It has a long growing season (9-10 months usually) and does not have to be harvested at any particular time -- for home consumption fresh, people may pull up a plant or two as needed. When it is to be

sold, or dried for home consumption, however, the whole crop is harvested at once. When corn and cassava are intercropped, sometimes one and sometimes the other is planted first. In Gajahrejo, for example, if the field is prepared by mounding the soil into long hills (digulud), the cassava cuttings (stek) are planted first, in the "valleys", and the corn seed later on the hills. However if hills are not made, the corn is planted first in rows and cassava later planted in between. The corn is harvested before the cassava, leaving just cassava, usually, for several of the dry months.

Other food crops are also intercropped with corn. In Ledoktempuro, sesame and otok beans are intercropped with corn in the first dry-season crop. In other parts of Pagak WKBPP, peanuts are intercropped with corn in the rainy season. Dry rice (padi gogo) may also be intercropped with corn or cassava in the rainy season. In Ledoktempuro, pumpkins are also intercropped.

In all areas, the timing for planting the crop at the beginning of the wet season is dependent on rain. In Gajahrejo when we were there in October, there had been a little rain, and a few farmers willing to take the risk had planted their corn. Most, however, had prepared their land and were waiting for more definite signs that the wet season had started before planting. In Gajahrejo, it is quite common to grow only one crop of corn per year because there is not enough water for more. Where there is enough water and there is not intercropped cassava still

the field, a second crop of corn may follow closely after it, around planted January to April. Where corn and cassava are planted together at the start of the rainy season, the corn is harvested between January and April and the cassava around August- September. The land lies fallow until the next corn crop.

Where a crop of cassava is planted alone without corn, a similar pattern is followed, the cassava being planted after the harvest of the rainy season corn crop.

Respondents in Gajahrejo and Pakisjajar reported the following harvest months for corn on dry fields over their last three corn crops. Planting is about three months earlier. It should be noted that these dates are approximate, people generally not remembering very well over periods which may be as great as 2 1/2 years.

Month:	Gajahrejo	Pakisjajar
Jan	8	5
Feb	18	2
Mar	12	3
Apr	9	6
May	2	5
Jun	1	9
Jul	0	6
Aug	4	3
Sep	5	1
Oct	4	0
Nov	2	2
Dec	0	9

It can be seen that in Pakisjajar, where water is not such a problem in agriculture, corn is grown more or less year round whereas in Gajahrejo, there is a very marked peak in the wet season. The minor peak in August-September may be people who planted corn and cassava early in the rainy season and had enough water to plant another corn crop after harvesting the cassava.

In Ledoktempuro, soybeans are planted in January at the height of the rainy season, and harvested in April. The land is then prepared for corn, planted in April or May, and often intercropped with otok beans, sesame and/or pumpkins. Pumpkins and sesame are harvested in July, corn in August, and otok beans in September. Then the land is prepared again and corn planted in September or October. This crop is harvested in December or early January. These dates are approximate, depending on rain. In some cases, where otok beans are not planted, the land is left fallow after the first corn crop until the second one, up to three months.

In each of the three villages, different local varieties of corn are grown. The table below shows the number of plots (dry fields) reported by respondents as currently or at the time of the last corn crop being planted in each variety, both local and HYVs.

No. of respondents' dry field plots planted in this variety currently or in last corn crop:

Gajahrejo Local	Goter	21
	Seli	2
	Penjalinan	2
HYV	Arjuna	5 (apparently one respondent)
Pakisjajar Local	Seli	6
	Ketik	3
	Tengahan	1
HYV	Pioneer	7
	Arjuna	3
	C1	1
Ledoktempuro Local	Kretek	9
	HYV	Arjuna

Another important dry-season crop in Ledoktempuro is chilli peppers, a cash crop not regarded as a secondary food crop.

Sugarcane is an important crop in Pakisjajar (though not in Krajan) and Ledoktempuro, being grown on dry fields. In Ledoktempuro, one wealthy farmer and trader, Sutahi, has stopped planting soybeans and now has 24 ha. of sugarcane, 18 ha. of this rented in small scattered plots from other farmers who needed money. He has been renting since 1985. This is what commonly occurs with sugarcane. This land, if cultivated by its owners, would almost certainly be planted in secondary food crops much of the year.

Tree crops are important in dry fields and around houses in all areas. They are frequently grown around the edges of fields and along the edges of terraces, sometimes in the middle of fields, and also as an orchard or plantation of one kind or mixed tree and perhaps other perennial crops. Most fields in which secondary food crops are grown have trees -- for example, coconuts, bananas, papaya, jackfruit, kapok, cloves, and many others including trees for firewood, stockfeed, and building purposes.

In Gajahrejo, tree crops are of major economic importance. Coconuts are very widely grown and people rely on these for income throughout the year. Other tree crops serve a similar purpose. People we talked to felt that tree crops were especially suitable for the area, and were interested in developing citrus cultivation.

Annuals such as sweet potatoes and yard-long beans are also frequently grown along the edges of fields.

Cultivation Practices: Corn

There are a variety of corn cultivation processes in use. The land is prepared by ploughing and/or hoeing, depending on the terrain and whether the farmer has access to a plough and draft animals. In Gajahrejo, because of the rocky ground, crow-bars are used. An unusual implement found there is the fork.

As mentioned previously, the soil may either be levelled out and have small furrows made (dilarik), or be mounded into hills (digulud). The traditional practice is to sow the seed by dropping (diulur) several from the hand at regular intervals along the furrows, then cover them over with the foot or plough. They may also be pushed into the soil with the hand. The method recommended by agricultural extension agents is to make holes with a dibble stick (digejik) and place seeds in the holes. Many farmers practice this now. However, in Pakisjajar we were told that many farmers prefer the old method, the reason given being that when the dibble stick method is used, root growth is poor. It is an almost universal practice to put many seeds together in a hole or spot on the furrow -- at least two or three and we saw up to seven or more plants growing together -- and later thin them out for animal feed. Besides providing feed, this method ensures that at least one plant will grow.² However, it is detrimental to the corn plant's growth and yield.

Case-study respondents report ploughing up to four times with various implements and in different directions. They report spacing of corn from 25 cm. (diulur method) through 30 cm. for furrows to 50 cm. for the dibble method intercropped with cassava and 80 cm. for the distance between hills with rows of cassava in between.

² There is a pest called shootfly (*Atherigono* spp.), lalat bibit in Indonesian, which attacks corn at the shoot stage. Farmers do not necessarily know about this pest -- all they see is that not all the seeds grow.

Fertilizers used are mostly chemical, though 23 respondents used manure on their most recent crop and one used green leaves. 14 of the manure users were from Gajahrejo. All manure users also used chemical fertilizers. Some farmers use just urea, others use urea and TSP mixed in equal proportions, and there are other combinations. Below are the fertilizers respondents reported using on their most recent corn crop in Gajahrejo and Pakisjajar.

	Gajahrejo	Pakisjajar	Ledok -tempuro
Urea only / +manure	0 / 0	3 / 5	0 / 6
Urea and TSP / +manure	4 / 13	0 / 1	0 / 0
Urea, TSP and Za / +manure	0 / 0	2 / 1	1 / 0
Urea and Za / +manure	0 / 0	4 / 2	0 / 0
Urea, TSP and KCL / +manure	0 / 0	0 / 1	0 / 0
Urea, TSP, Za, KCL / +manure	0 / 0	0 / 1	0 / 0
TSP and Za / +manure	0 / 1	0 / 0	
Urea and green manure / +manure	0 / 0	1 / 0	0 / 1

Farmers who can afford to, apply fertilizer twice or, for HYVs, three times. occasionally fertilizer is also applied before planting. The first application is made around 20-30 days,

the second around 45-50 days. The fertilizer is sprinkled beside or around each plant or cluster of plants, and then the crop is didangir, the soil is loosened with a hoe and heaped around each plant, the fertilizer being covered over, and at the same time destroying weeds. This process is done whether or not fertilizer is applied. It may also be done with a plough.

From our interviews and discussions, it would seem that generally the amount of fertilizer used is far below that recommended. Respondents in some cases knew that recommended application rates were much higher but could not afford the further expense or were not convinced that results would justify the expense. One application rate quoted was 37.5 kg. each of urea and TSP for 0.5 ha. on the first application and 20 kg. each on the second. Another was 10 kg. of urea for 0.4 ha. on the first application and 5 kg. on the second. Application rates would vary greatly, depending largely on how much money is available at the time or to what extent the farmer is prepared to go into debt.

Pulling up of extra plants (dibedhol) is done at varying times. Some farmers reported doing it at the time of the first application of fertilizer (around 20 days). However sometimes it is left until two months, presumably with the intention of providing stockfeed; at this age the process has a different name, dibajug. We saw corn after its first hoeing where there were still several plants together.

Pesticides are rarely used in Gajahrejo. Six respondents reported pest or disease problems with their last corn crop, but none used pesticides. There is much greater usage in Pakisjajar. Fourteen respondents reported problems and eight of these used pesticides. Dosage appears to be highly variable and not based on product instructions. It is common to mix pesticides. Farmers have virtually no awareness of the dangers of pesticides.³

Corn is harvested by hand. The plants are usually cut off close to the ground or below the ears, then the ears are removed at the edge of the field. The husks may be peeled off before carrying home, if they are to be stored for a short while or sold in this form, or they may be tied together with the husks still on for longer-term storage.

Post-harvest Processing and Storage. After harvest, corn is dried in the sun outside the house, with the husk either removed or still attached. Sometimes husked corn is stored in sacks. For longer storage, ears have some outer husks pulled back and are tied together by these husks in bunches. Two bunches are then tied together and these are stored high above the kitchen cooking fire. If corn which is not stored above the kitchen fire

³ Information on pesticides used and for what pests was obtained from questionnaire and case-study respondents and discussed in focus groups. Little usable dosage information was obtained as people usually do not know how much they used or the area on which it was used. This kind of information is very difficult to obtain without observing the preparation and application.

shows signs of deterioration from pests (bubuken), it may be smoked by burning dry leaves underneath the storage place, or it may be sold.

Farmers consistently report that traditional varieties of corn keep longer than HYVs, and this is one reason given for not growing HYVs if corn is grown for consumption. Respondents said traditional varieties can be stored up to six months or even longer, while HYVs deteriorate (bubuken) after as short a time as one month or as long as four months.

For consumption as a staple, corn is scraped off the cob, ground in a grindstone or by other means, and steamed like rice. It is in fact referred to as "nasi jagung", "corn rice". It is often mixed with rice or dried cassava. Rice is a "status" food and regarded as preferable but corn is enjoyed by those used to it and, at least in some areas of Java, corn or a mixture is regarded as better before hard work in the fields as it keeps one going longer.

NEW TECHNOLOGY

Our interest is in the use of new agricultural technology and practices which can increase yields of secondary food crops and help raise farmers' incomes and levels of welfare, without causing adverse effects such as health damage from pesticides, a shift towards monoculture, or dependence on technology which is

hard to maintain for economic or technical reasons. The new technology we looked at included high yielding varieties of corn and soybeans, chemical fertilizers, and pesticides. Practices include soil preparation and planting techniques, weeding, application methods for fertilizer and pesticides, and post-harvest practices.

I shall focus here on corn. Information on soybeans is available in the data-base and in focus-group reports.

The use of HYV corn differs markedly among the three villages. In Gajahrejo, where corn is mainly grown as a subsistence crop, only one of the 18 respondents had ever planted HYV corn. In Pakisjajar, 11 out of 21 had, and in Ledoktempuro, 2 out of 8. The varieties grown were:

	Number of Cases		
	Gajahrejo	Pakisjajar	Ledoktempuro
Arjuna	1	11	1
C1	0	2	0
Pioneer	0	3	0
Harapan	0	1	0
Other (early) HYVs	0	1	1

Of the 8 respondents in Ledoktempuro, only one had ever planted HYV soybeans, the variety being Willis, the only HYV generally available.

With the last corn crop, one respondent in Gajahrejo planted an HYV, six respondents in Pakisjajar did, and one in Ledoktempuro. In Pakisjajar, more respondents planted HYVs in the rainy season than in the dry (most of the most recent corn crops described were in the dry season).

In focus groups and case-studies, we explored farmers' reasons for choice of variety. Each village had certain preferred traditional varieties of corn (the same applies to soybeans). Some farmers had tried HYVs and returned to traditional varieties and, as can be seen in the above table, many had never tried any.

In Gajahrejo, farmers said that the HYVs available were not suited to local soils and climate, that is, to the poor soil and dry conditions. They said that even with increased fertilizer applications, yields are similar to local varieties, and the HYVs need extra attention and expense such as pesticides and fertilizer. Their conclusion was that they were likely to make a loss by growing HYVs.

A village shop (the Suyitnos', managed by the wife; the husband trades in cassava) had recently started stocking small quantities of HYVs as a trial. When we visited, there were two HYVs in stock: Arjuna in a sealed and labelled package, and a seed described as "hybrid" in bulk and unlabelled. It was too cheap to be a genuine hybrid -- it was probably second or third generation. This illustrates a major problem in the promotion of HYVs of both corn and soybeans: they may be second or third

generation, they may be mixed, or the quality may be poor for some other reason -- the latter has been reported even for certain brand-name varieties. When a farmer has poor results from a trial with a new variety, the effect may be that no-one that he or she knows is prepared to risk trying that variety, or even any HYV if s/he has not observed better results with others. A few farmers were planning to try HYVs this wet season (1988/89).

In Pakisjajar, where more people grow the new varieties but many do not, people said that what farmers hope from a harvest is "enough to eat", and therefore eating quality is an important factor in decision-making. Both Arjuna and Pioneer are considered tasteless (sepa or hambar) and hard (kaku), Pioneer very hard. If cooked in the morning, local varieties are still soft in the evening, whereas these HYVs have turned hard. In Ledoktempuro there was a similar complaint.

Another important factor mentioned in Pakisjajar and elsewhere is the time from planting to harvest. The local Pakisjajar corn matures in 90 days, whereas Arjuna and Pioneer have a longer growing period, at least in farmers' fields. In Ledoktempuro this reason was mentioned and also a wind problem: farmers have found that HYV plants blow over in heavy rain with wind which is common in the area. However, a wealthy farmer (Sutahi, the wealthy sugar-cane farmer and trader) told us that this problem is solved by banking the hills (guludan) up higher. We heard (indirectly) from Pioneer that they have a short corn

variety which is less subject to wind damage, but people in Ledoktempuro had not heard of it. Sutahi reported that while sellers of Arjuna claim an 85 day growing period, his experience is 100 days and for ordinary farmers it is 105. In Pakisjajar we were told 90-105.

In Pakisjajar, focus group participants reported that recently, older farmers who in the past would have passed over the responsibility for working their land to their adult children are tending to continue cultivating it themselves as they are afraid their children would sell the land. Thus there are more elderly active farmers than in the past. It is, however, younger farmers who tend to be willing to invest more in their agriculture (though not as much as would be required to follow the recommendations of the agricultural extension agent). The older generation sticks to the old way of "as long as the harvest is enough to feed us". In Pakisjajar, the participants said, the older generation refuses to take advice from their children.

Respondents who had grown HYV corn were asked how they first knew about the variety they had tried. Their responses were:

	Gajahrejo	Pakisjajar	Ledok-tempuro
From friend or another farmer	0	4	0
From wealthy farmer or village official	1	1	0
From extension agent	0	3	0
From Agriculture Office	0	1	0
From KUD shop	0	1	0
From demonstration plot	0	1	0
From a seed shop in town	0	0	1
Radio	0	1	0

Eight of these thirteen respondents (one respondent reported two sources) reported having seen the variety growing before trying it themselves.

Focus group participants commented that there is less information available on dry-land agriculture than there is on wet-rice and some other non-secondary-food-crops. One focus group pointed out that extension agents (PPLs) have less knowledge of secondary food crops than they do of wet rice-- this came up in relation to advice on pest control. In Gajahrejo, focus group participants commented that Siaran Pedesaan, the government radio program for villages, rarely deals specifically with crops suitable for cultivation in very dry areas, or the problems associated with farming in such areas.

Purchase of Inputs

A recurrent theme amongst respondents and focus group participants was the cost of inputs. Few of the farmers we encountered felt that they could afford to purchase the input levels recommended. This can mean that they do not have access to the money needed at the time the inputs are needed, and/or that they are not willing to take the risk they perceive in investing further in a crop they are not sure -- or do not believe -- will yield a more-than-commensurately increased harvest.

Generally, money for inputs in the villages studied came from selling other agricultural produce such as coconuts and bananas, or cassava, or corn from a recent harvest. Other sources of money for inputs are chickens sold and agricultural labor. Some farmers buy fertilizer on credit from a village shop, paying it back when they have the cash, for instance from selling coconuts in Gajahrejo, or at harvest time in cash or produce -- in Gajahrejo, the Suyitnos' shop sells fertilizer and they are also traders in agricultural produce; the cost of inputs purchased can be subtracted from the price of corn sold at harvest. Many farmers are not prepared to go into debt to purchase inputs, because they are afraid they will not be able to

repay the debts. Thus their application of fertilizer or pesticides, or their decision to purchase HYVs, is each season dependent on cash availability.

Few respondents had had government credit of any sort for growing corn or other secondary food crops. This reflects the lack of emphasis on improving yields with these crops until recently.

CONSUMPTION AND MARKETING OF CORN

There are several patterns of consumption and marketing of corn. Virtually all households consume some of the corn they grow. Some consume all. Others sell small quantities when they need cash. Some sell part or, rarely, all of the crop at harvest time. A few store corn with the aim of selling it when the price rises. A total of two respondents said they sold all their local corn immediately after harvest. Two said they sold all their HYV corn. The table on the following page shows the pattern.

	Gajahrejo	Pakisjajar		Ledoktempuro
		Local	HYV	
Some sold immediately	3	7	2	3
All sold immediately	0	1	2	1
Some sold bit-by-bit	4	9	1	4
Some or all stored till price rises	2	3		1
Some or all consumed	18	18	2	7
Average months till corn runs out	3.8	4	3.5	5.9

MEDIA AND LOCAL ORGANIZATIONS:
CHANNELS FOR PROMOTING TECHNOLOGY TRANSFER

This chapter provides a brief discussion of the media and organizational data and findings obtained from questionnaire two and found in the following files: KUES2-1.DBF, KUES2-2.DBF, AND KUES2-3.DBF. There is considerable information about listening, viewing, reading and leisure time habits that cannot be presented here. The above database files can be accessed for additional quantitative information (for example, favored listening hours) or qualitative information (for example, respondents' comments on why certain programs are popular or not popular).

Radio

The survey data indicates that while only slightly over 50% of respondents in Gajahrejo and 40% of the respondents in Pakisjajar own their own radios. An additional 30-40% of respondents listen to the radio in their neighbors' homes. Altogether more than 1/3 of respondents in Gajahrejo and 1/4 of respondents in Pakisjajar report listening to the radio every day.

RRI Malang is the station most listened to by nearly half of all respondents in Gajahrejo. The only other station with a large audience (>30%) is Andalus, a commercial radio station. RRI Malang is also the favorite radio station of 25% of all respondents in Pakisjajar. However, two other stations, KS8 (commercial) and RRI Surabaya each report approximately 15% of listener audiences.

Programming preferences should also be noted. In both Gajahrejo and Pakisjajar entertainment programs were more than twice as popular as news and agricultural programs. Only 20% of respondents in the two village report listening to Siaran Pedesaan or agricultural programs. Focus group members in Pakisjajar stated that they turn the radio off in the evenings, when Siaran Pedesaan comes on the air, because they are tired and would prefer to listen to entertainment. Perhaps, an entertainment program with short but useful agricultural messages would be more effective.

Answers to questions about language preferences and difficulties in listening suggest that respondents find Javanese language programs are less difficult to understand than Indonesian ones. See the section on language below for more information on the greater usefulness of Javanese (and presumably other local languages) in media campaigns.

There appear to be no major gender differences in station or programming preference. Female respondents are slightly more likely than males to be reached with messages in Javanese

language rather than Indonesian. However, this difference does not appear significant.

Television and Film

Only 15% of all respondents in the three research villages stated that they owned a television. No respondents in Gajahrejo owned televisions. About 30% of all respondents reported that they watch television frequently. 45% of all respondents in Pakisjajar watch television frequently. However, only 25% of respondents in Gajahrejo are frequent television watchers. Interested readers might like to explore the television questions in Kues2-2.dbf for more information on viewing habits. However, for these two villages radio appears to reach a larger audience and to do so more frequently.

Films do not appear to be a common feature in respondents lives. Only 40% of male and 20% of females in Gajahrejo stated that they had ever seen a film. In Pakisjajar no male and only 1 female respondent reported ever having seen a film. In Ledoktempuro 50% of both male and female respondents had seen a movie.

Literacy and Language

Just over 10% of all respondents in Gajahrejo and 33% of all respondents in Pakisjajar reported either that they were illiterate in any language or that they could read a little in any language. When asked whether they could read in a language,

twice as many respondents in Gajahrejo reported that they had difficulty with or could not read Indonesian than stated that they could. In Gajahrejo, Javanese language was much more useful as a reading medium. More than three times as many respondents reported that they could read it as reported that they could not or had difficulty. In Pakisjajar, as one might expect, near a large city, the number finding difficulty with Indonesian was less. In Pakisjajar about an equal number found it difficult or impossible to read in Javanese and Indonesian.

The survey data suggests that Javanese is preferable to Indonesian as a medium for agricultural messages. Radio or spoken messages as a part of traditional entertainment (wayang, sandiwara, ludruk etc.) is preferable to written information and, that where print media are used, simple messages and use of graphics etc. is preferable to long or complex text.

Organizations

Organizations are not a major feature in the lives of most respondents. Only 20% of respondents in Gajahrejo and 55% of respondents in Pakisjajar reported that they were involved in any organizations. Almost no respondents in Gajahrejo reported involvement in government-supported farmers' groups (kelompok tani) or listeners' groups (kelompencapir). In Pakisjajar about 10% of respondents reported being active in such groups. There was slightly higher participation in PKK (Women's Family Welfare Groups).

It is not clear from the investigation whether these "formal" organizations were not active because they did not fulfill a perceived local need or whether the organizations lacked sufficient outside or local resources to be effective. Informal organizations or activities based around religious observances (tahlilan and pengajian) and funeral/burial associations (designed to provide savings for and assist with funerals) were much more popular. Again involvement in these informal organizations was far greater in Pakisjajar than in Gajahrejo. Greater distances between houses and between hamlets may be a factor in making organizational life more difficult in Gajahrejo.

Conclusions

The survey data and focus group information support the use of radio, oral messages (as parts of traditional or modern performances) and graphics rather more than TV, film or complex textual messages as probably more effective instruments for reaching and influencing farmers. It also supports greater use of informal organizations or at least questions the use of farmers groups, cooperatives, listeners groups, etc. as major media channels.

The database should be accessed for further information about farmers' attitudes toward media, program selection, etc. Considerable data is available in memo and character fields in the database cited above. A trained operator is available at the development investigation field site in Malang who can access further data. Additional analysis and testing of the media data is called for but this would require short-term employment of a social scientist familiar with the data, languages and research sites.

CONCLUSIONS AND RECOMMENDATIONS

MEDIA CAMPAIGNS

Goals

The following goals are recommended in planning media campaigns in East Java:

1. To provide farmers with the information they need to make informed decisions about cropping systems.
2. To increase the range of options farmers have in agriculture.
3. To help give farmers confidence to try new varieties of crops and other inputs, by specifically addressing their concerns regarding risks and suitability of particular varieties to local conditions and the benefits of specific levels of inputs under local soil and climatic conditions.
4. To address certain common misconceptions and practices which appear inappropriate to local conditions.

Choice of Media

Radio is a medium which reaches a large percentage of the rural population. Stations should be chosen to correspond to local listening habits and reception areas. If stations less commonly listened to are used, effective advertizing would be necessary, perhaps on calendars or posters (see below).

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Radio programs should be short, or otherwise popular forms of entertainment should be interspersed with messages. If possible, it would be good to schedule programs immediately before or after popular programs. Attention should be paid to the various times people listen to the radio. A program should be repeated at several different times of the day and probably on more than one day.

It is strongly recommended that programs be in the local language rather than Indonesian. Care should be taken to ensure that language conforms to village usage -- some agricultural programs in Javanese are so full of technical Indonesian terms that the whole program might as well be in Indonesian. The Javanese or Madurese should be conversational and any terms not commonly used by ordinary farmers should be explained.

Print media which make use of pictures and simple text, in the local language, are also recommended.

The advantage of print media, if people have it in their possession, is that it can be referred back to at any time, and in particular, at the time an agricultural process is to be performed. Thus reasonably inexpensive, widely distributed items are desirable.

While many farmers are not literate or find reading difficult, most have children who can read text to them.

Calendars and posters are a popular form of decoration for houses and food stalls. They would probably also have appeal for schools. Attractive, colorful calendars and posters have good

potential for attracting attention and conveying information which can be presented in this form.

The advantage of calendars is that they can present agricultural information timed for growing seasons, like a gardening calendar. Care should be taken to plan it according to the local agricultural pattern. A calendar could also usefully be coordinated with radio programs.

Photo-novels and other photo-literature are recommended because of their attractiveness, because by local photography they can be set in the target area, and because they are a good medium for dealing with a particular topic at some length and, like other print media, in a form which can be consulted at leisure.

Live Entertainment and Films

The advantages of live entertainment and films held in a village is that they would be expected to attract a large audience and have the potential to make a vivid impression. However, they require a large budget. They have the potential to present a lot of information over a fairly lengthy period, with reinforcement. The disadvantage is that they are a one-time presentation unless backed up with print media and/or radio programs.

Video recordings are not a viable option for a wide audience as such a small number of people can view them at one time. They could be used to present information to a small group of people

such as shop and kiosk owners (see below) or innovative farmers. Combinations of Media. As already mentioned, combinations of media could probably be used very effectively to reinforce each other. Suggestions in print media could, for example, be discussed individually in short segments on the radio.

Target Groups

Targeting should be specific. For most messages, a particular area with climatic and soil similarities should be targeted with information relevant to local physical and socio-economic conditions.

Some information can be targeted at farmers of all socio-economic groups -- examples are planting techniques or safety in pesticide use. Other information, however, should be targeted at groups who have expressed particular concerns, for example, farmers who do not have cash to buy inputs, or those who consume their entire crop.

Besides farmers themselves (male and female) as the major target groups, other groups could be tested as effective channels of communication. One of these is primary or junior high school classes. Students could possibly act as effective channels of communication to parents, through verbal communication, demonstration, and print materials taken home. Even if they do not influence parents' practices, many students will be farming themselves in a few years' time. Some teachers (I talked to one such, Sawian, in Gajahrejo) are interested in teaching both

students and parents about new agricultural practices, conservation and so on. Such teachers would probably welcome information and resources.

Messages

Messages should address the target group's concerns. This may mean providing information to solve agricultural problems (preferably simple, low-cost suggestions), or to enable farmers to grow a crop they are interested in but do not feel they know enough about to try, or to correct misconceptions or unsatisfactory techniques which lack of information has promoted.

In addition, messages may sow new ideas, as long as the ideas are presented in such a way that farmers can relate them to their situation, in terms both of their land and of their socio-economic position.

It is important that people's worries or fears about a new technology be addressed. For example, in Gajahrejo, HYVs and fertilizer application need to be discussed with reference to poor limestone soil and dry conditions. Varieties recommended should have been found suited to such conditions. The problem reported of HYV corn keeping a much shorter time than local varieties needs to be dealt with, perhaps by recommending the planting of both local and HYV corn, the HYV corn being consumed first or sold. If eating quality is a problem, perhaps there is a slightly different cooking method which can help.

It is also important that messages take existing technology

and practices as their starting point and relate new suggestions to these.

Pretesting

All messages should have some form of pretesting with the target group, though not necessarily using the medium through which the message will ultimately be presented. The dialogue for a radio series, for example, could be tested in a focus group-like setting, with the speakers going through the dialogue and then having it discussed. A photo-novel could be discussed during the photography phase with those involved.

Monitoring

It is recommended that focus group discussions be held amongst the target groups to help assess the effectiveness of media campaigns. It would probably also be useful to follow-up a number of the study respondents as a way of monitoring media campaigns.

School campaigns could easily be monitored.

INSTITUTION BUILDING

Decisionmakers

An important aspect of the pilot project involves the communication of farmers' experience, problems and concerns to decisionmakers at national and lower levels. Ways need to

explored to do this effectively. Elements of a successful campaign would include:

- the presentation of farmers -- large and small -- as rational and knowledgeable actors with experience to convey to others.
- a medium which would attract the attention of decisionmakers.
- a means of approaching decisionmakers and presenting the message which would be well-received and would not back-fire on the presenters or originators of the message.

Training

Two kinds of training are recommended. The first is training of people who are potential channels of communication to farmers. These would include teachers, as mentioned above, and shop or kiosk owners who sell agricultural inputs, to enable them to become effective sources of information on the products they sell.

An obstacle to their becoming the best sources of information is the fact that they sell only a limited range of inputs, so may not in fact stock the most appropriate seed or pesticide for a customer.

The second kind of training is to enable similar studies of farm families to be conducted in other provinces. What is anticipated is training for personnel of the Department of

Agriculture in other provinces to enable them to plan and contract for a study to be conducted by an institution such as a P.V.O. or university. The training would present and explain the present research and discuss ways of adapting it to other areas.

It is recommended that PPIIS be contracted to conduct the training in conjunction with the Senior Communications Specialist and a social scientist familiar with the study.

Revision of Research Instruments and Preparation of Research Manual

It is recommended that the research instruments be revised on the basis of experience with the present study. The aim of the revision would be to produce a simplified set of instruments in Indonesian which could be easily adapted for use in other provinces.

The revised instruments should be accompanied by a research manual with detailed explanations of the household questionnaire, focus group guides and case study interview guides and methods for qualitative and quantitative data collection. This should be done by a social scientist with the appropriate language and research skills.

FURTHER ANALYSIS OF DATA

The study has produced a wealth of data, only a small amount of which it has been possible to analyze and present in this

report. It is strongly recommended that further time be spent on analysis of already collected data. Particular attention should be paid to qualitative data in memo fields and to relating data from different databases.

FURTHER RESEARCH

Field experience, to date, has suggested topics of research worth further investigation. One suggested study would link in with training of shop and kiosk owners and would aim to achieve a better understanding of the sale of agricultural products at the subdistrict and village level. Another study would look at fertilizer and pesticide usage.

APPENDIX A

DATABASE APPLICATIONS

A GUIDE TO USING THE QUESTIONNAIRE DATA

- I. The following is a brief guide to possible uses of the questionnaire database as a tool for agricultural communications and for other policy purposes. It should be kept in mind that there are in excess of 50,000 entries (individuals x responses) in 25 databases in the East Java SFCDP Pilot Project in Agricultural Communications. This guide demonstrates some of the ways that data can be accessed from various databases. A complete examination of the possible uses of the questionnaire data set would be several hundred pages long. This guide is intended to explore how a user might gain useful information from the database. It is not meant to be a comprehensive manual. All data has been entered in DbaseIII+ (Copyright Ashton Tate). Users should have at least a minimal proficiency with that database program.

- II. It should be noted that the samples selected for the databases are purposive rather than random and not large enough to be statistically significant. The purposive

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samples chosen here were meant to provide parameters for a communications pilot project and to test the efficacy and feasibility of using modular questionnaires and other qualitative methods and micro-computer database storage and access in support of a communications program. The data generated from the questionnaires poses further research questions and suggests certain pilot communications efforts. It is not meant to provide conclusive support for a particular communications strategy or agricultural policy.

III. Four basic categories of user applications of the database are described and then demonstrated below. They are: (1) identifying characteristics of possible communications (farmer) target groups; (2) identifying obstacles to the effective use of new agricultural technology; (3) evaluating and selecting media channels for agricultural communications and (4) identifying and exploring the characteristics of individual farm families that can be used as reference points for media and technological innovation programs.

IV. Identifying communications target groups.

In a communications pilot, an obvious need is to determine the pilot's target population and to understand the major characteristics of that target population. A quantitative database can aid that process by identifying "types" of

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target groups. The database files, KUES1-1.DBF and KUES1-2.DBF, attempt to do this. In a project intended to promote the cultivation of new secondary food crops one crucial target group distinction is between users and non-users of high-yielding varieties (HYVs) of corn and soybeans. The databases reveal that 14 of 47 respondents have at some time planted HYV corn and 6 of 47 have planted HYV soybeans. It then becomes possible to compare and contrast socio-economic and other characteristics of agricultural innovators with those who have not tried new varieties. The two databases mentioned above are designed to assist with this task.

The following example illustrates how the database can be used for identifying target group characteristics:

1. Use KUES1-2.DBF
2. List
3. Search
4. Select "HYVCORN" [RETURN]
5. Select "NO MORE CONDITIONS" [RETURN]
6. Select "CONSTRUCT A FIELD LIST" [RETURN]
7. Choose the fields that you wish to relate to your independent variable (use of hyvcorn)...
e.g. Select "SAWAH", "RENTSAWAH", "PAWNINSAWA"
8. Select "EXECUTE THE COMMAND"
9. Select "Y" when asked to output to printer

The result would be a list of all innovators who used HYV corn and information about whether they owned, rented or pawned in ricefields.

V. Identifying obstacles to effective innovation.

A quantitative database can assist in the identification of factors that hinder the adoption of new agricultural technologies or reduce the usefulness of agricultural innovation. In the research conducted for this project qualitative methods (farm family focus groups and case studies of individual farmers) were the major instrument for identifying obstacles to innovation and factors promoting innovation. Where time permits qualitative research can be useful in determining and refining the questions that are asked in farmer surveys. It is also constructive to use qualitative research methods to follow up and explore conclusions suggested by the survey research data.

For our purposes obstacles to agricultural innovation can be divided into two types: (1) obstacles that can be overcome or reduced by a media campaign and (2) obstacles that can only be overcome by policy change. Survey data in a database format should be useful for identifying both types of problems. However, it will be up to the media expert and other decision makers to determine which constraints are most likely to be weakened or overcome by media efforts.

The following is an example of how to access the database to search for obstacles to adopting new technology:

1. Use KUES2-3.DBF
2. List
3. Search
4. Select "CORNHYV_T" [RETURN]
5. Select "NO MORE CONDITIONS" [RETURN]
6. Select "CONSTRUCT A FIELD LIST" [RETURN]
7. Choose the fields that you wish to relate to your independent variable (use of hyvcorn)...
e.g. Select "CORNWHY_T", "CWHY_T_ADD"
8. Select "EXECUTE THE COMMAND"
9. Select "Y" when asked to output to printer

The result will be a set of brief farmer comments on what they plan to plant next season and why. You should be able to see patterns in continuation or abandonment of HYV. You may then like to refer to module H, J, K, L, M, or N for more information on corn cultivation. The VIEW command can be used to select fields from one or more databases for comparative purposes.

VI. Selecting media channels.

An agricultural communications database should be a useful instrument for assisting with policy decisions about what media channels will be most effective for reaching the intended audience. The database files KUES2-1.DBF and KUES2-2.DBF provide extensive information about viewing, listening and reading habits in the research villages and about the potential for the use of traditional art forms (e.g., shadow plays and dance dramas) for communicating

project-related messages.

The following example shows how to use a query file to access media-related information from the data base.

1. Use KUES2-1.DBF
2. Create [RETURN]
3. Select "QUERY" [RETURN]
4. Name the query file
5. Select "FIELD NAME" [RETURN]
6. Select "RRI MALANG" [RETURN]
7. Select "Is True" [RETURN]
8. Select "EXIT" [RETURN]
9. Select "SET UP" [RETURN]
10. Select "QUERY" [RETURN]
11. You will now be able to construct a field list or use the search features on the database to find out the listening times or favorite programs of the respondents. To do this use the list files command as described in the previous examples.

VII. Identifying and using reference farm family records.

The database format can also be used for identifying individual farmers whose agricultural or socio-economic characteristics make them a useful reference point for target populations of specific media campaigns. These farmers can be studied in depth across the whole range of characteristics covered by the 25 databases. It also becomes possible to re-visit these farmers and use qualitative techniques to plan and refine media trials.

Finally, it could prove useful to select specific questions from the databases and then, after a media trial, to selectively resurvey farmers representative of the target group to evaluate the success of a media campaign.

1. Use KUES1-2.DBF
2. List
3. Search
4. Select "HYVCORN" [RETURN]
5. Select "AND" [RETURN]
6. Select "G" [RETURN]
5. Select "NO MORE CONDITIONS" [RETURN]
8. Select "CONSTRUCT A FIELD LIST" [RETURN]
7. Select "RESPNO", "NAMEKK", "WIFENAME"
8. Select "EXECUTE THE COMMAND"
9. Select "Y" when asked to output to printer

The result will be a list of farmers in Gajahrejo who have planted HYV corn, their respondent number, and the name of the head of household and wife of the head of household. The browse feature of Dbaseiii+ can be used to look at other fields by respondent number and the farm family's household names can be used for follow up research or pilot communications efforts.

APPENDIX B

LIST OF DATABASE FILES

FILE NAME	DESCRIPTION	NOTES
KUES1-1.DBF	QUESTIONNAIRE 1	Family, Socio-economic, Occupational
KUES1-2.DBF	QUEST. 1 CONT.	
KUES2-1.DBF	QUESTIONNAIRE 2	Media
KUES2-2.DBF	QUEST. 2 CONT.	Media
KUES2-3.DBF	QUEST. 2 CONT.	Organizations, Agricult. choices
DUL-A.DBF	MODULE A	Cultivation conditions
DUL-B.DBF	MODULE B	"
DUL-C.DBF	MODULE C	"
DUL-D.DBF	MODULE D	"
DUL-E.DBF	MODULE E	"
DUL-F.DBF	MODULE F	"
DUL-G-1.DBF	MODULE G	Present/last Crop
DUL-G-2.DBF	MODULE G CONT.	Previous Crop
DUL-G-3.DBF	MODULE G CONT.	Earlier Crop
DUL-G-4.DBF	MODULE G CONT.	Water Supply
DUL-H.DBF	MODULE H	Corn
DUL-J.DBF	MODULE J	Corn
DUL-K.DBF	MODULE K	Corn
DUL-L.DBF	MODULE L	Corn
DUL-M.DBF	MODULE M	Corn
DUL-N.DBF	MODULE N	Corn
DUL-O.DBF	MODULE O	Soybeans
DUL-R.DBF	MODULE R	Soybeans
DUL-T.DBF	MODULE T	Soybeans
DUL-U.DBF	MODULE U	Soybeans

APPENDIX C
DATABASE CODES

DAFTAR KODE :

FIELD	KODE	KETERANGAN
CORNVARHYV -	1	Arjuna
	2	C1
	3	CPI1
	4	Pioneer
	5	Kalingga
CORNVARLOC	1	Goter
	2	Jengahan
	3	Seli
	4	Kretek
	5	Penjalinan
	6	Ketik
	7	Alit
RICEVAR	1	IR36
	2	IR64
	3	Kruwingaceh
	4	Cempaka wangi
	5	PS
	6	Citandui
	7	Barito
	8	Cempo
	9	Lokal sawah
	10	Lokal gogo
	11	Cipunegara
	12	Cisedane
	13	GH
CASSVAR	1	Tapak lumut
	2	Sempung putih/pohong putih
	3	Markani
	4	Sempung abang
	5	Katik
SOYVARHYV	1	Willis
	2	PB
SOYVARLOC	1	Kuning
	2	Hijau
RADIOWHILM	0	Tidak pernah
	1	Istirahat/santai/tidak apa-apa
	2	Bekerja
	3	Ngobrol
	4	Masak
	5	Momong/mengasuh anak
	6	Khusus mer'engarkan
7	Menjahit	

RADIOWHERM	0	Tidak pernah
	1	Rumah
	2	Tetangga
	3	Rumah anak
	4	Rumah orang tua
PEDESAAN, dll	0	Tidak
	1	Bapak saja
	2	Ibu saja
	3	Kedua-duanya
PRAC_PROG	1	RRI Malang
	2	RRI Surabaya
	3	RRI Jember
	4	RRI Sumenep
	5	RRI Other
	6	BIP Wonocolo
	7	RKPD Kepanjen
	8	RKPD other
	9	Andalus
	10	KDS8
	11	TF 77
	12	Pioneer
	13	Kutilang
	14	Senaputra
	15	GL 67
FAVORITE-M	1	Siaran Pedesaan
	2	Warta berita
	3	Ludruk
	4	Sandiwara radio
	5	Wayang
	6	Musik
	7	Acara untuk wanita
	8	Hiburan

APPENDIX D
DATABASE STRUCTURES

Structure for database: C:\KUES1-1.dbf
 Number of data records: 47
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	INTVIEWER	Character	13	
5	DATE_INT_1	Date	8	
6	DATE_INT_2	Date	8	
7	MKK_INT_1	Logical	1	
8	MKK_INT_2	Logical	1	
9	FKK_INT_1	Logical	1	
10	FKK_INT_2	Logical	1	
11	WIFE_INT_1	Logical	1	
12	WIFE_INT_2	Logical	1	
13	SON_INT_1	Logical	1	
14	SON_INT_2	Logical	1	
15	DAU_INT_1	Logical	1	
16	DAU_INT_2	Logical	1	
Press any key to continue...				
17	OTHERRESP1	Character	20	
18	OTHERRESP2	Character	20	
19	OTHERPRES1	Character	20	
20	OTHERPRES2	Character	20	
21	RT	Character	2	
22	HOUSENO	Character	3	
23	KKFULI NAME	Character	20	
24	KKKNOWNAM	Character	20	
25	KK_SEX	Character	1	
26	HHOLD_NO	Numeric	2	
27	HUSBAND	Logical	1	
28	WIFE	Logical	1	
29	WIFENAME	Character	20	
30	SON15OVER	Numeric	1	
31	DAU15OVER	Numeric	1	
32	CHILDUND15	Numeric	1	
Press any key to continue...				
33	SONINLAW	Numeric	1	
34	DAUINLAW	Numeric	1	
35	FATHER	Logical	1	
36	MOTHER	Logical	1	
37	GRANDCHILD	Numeric	1	
38	OTHERS	Logical	1	
39	AGE_M	Numeric	2	
40	AGE_M_CODE	Character	1	
41	AGE_F	Numeric	2	
42	AGE_F_CODE	Character	1	
43	AGEOLDCHIL	Numeric	2	
44	AGECHICODE	Character	1	
45	OTHERKK	Logical	1	
46	YRSED_M	Numeric	2	
47	SCHOOL_M	Character	5	
48	GRAD_M	Logical	1	

25

Press any key to continue...

49	YRSED_F	Numeric	2
50	SCHOOL_F	Character	5
51	GRAD_F	Logical	1
52	YRSEDCHILD	Numeric	2
53	STILLSCHOO	Character	1
54	SCHOOLCHIL	Character	5
55	GRAD_CHILD	Logical	1
56	WORK_M_1	Character	20
57	WORK_M_2	Character	20
58	WORK_M_3	Character	20
59	WORK_M_4	Character	20
60	WORK_F_1	Character	20
61	WORK_F_2	Character	20
62	WORK_F_3	Character	20
63	WORK_F_4	Character	20
64	CHILD_TANI	Logical	1

Press any key to continue...

65	CH_BURUHT	Logical	1
66	CH_BURUHLA	Character	20
67	CH_TUKANG	Logical	1
68	CH_PEGAWAI	Logical	1
69	CH_KARYAW	Logical	1
70	CH_DAGANG	Logical	1
71	CH_OTHER	Character	20
72	LABORER_M	Character	20
73	LABORER_F	Character	20
74	TRADE_M	Character	30
75	TRADE_F	Character	30
76	TUKANG_M	Character	20
77	TUKANG_F	Character	20
78	HOMEIND_M	Character	30
79	HOMEIND_F	Character	30
80	COURSE	Logical	1

Press any key to continue...

81	AGCOURSE	Character	20
82	AGCOUPLACE	Character	15
83	AGCOUYEAR	Character	5
84	AGCOULENGT	Character	10
85	AGCOURSEAD	Memo	10
86	MEMO1	Logical	1
87	VILLOFFIC	Character	1
88	VILLOFFWHO	Character	10
89	VILLOFFPOS	Character	10
90	CHILDAWAY	Logical	1
91	SCHOOL_NO	Numeric	2
92	WORK_NO	Numeric	2
93	HOME_NO	Numeric	1
94	SCHOOLWHER	Character	30
95	WORKWHERE	Character	30
96	HOMEWHERE	Character	30

Press any key to continue...

97	WORK_WHAT	Character	30
98	WORK_YEARS	Numeric	4
99	WORK_RETUR	Character	20
100	HOME_RETUR	Character	20
101	WORK_MONEY	Character	15
102	HOME_MONEY	Character	15
103	CH_AWAYADD	Memo	10
104	MEMO2	Logical	1
105	NOTES	Memo	10
106	MEMO3	Logical	1
**	total	**	959

1

Structure for database: C:\KUES1-2.dbf

Number of data records: 47

Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	WALL_FRONT	Character	2	
5	WALL_SIDE	Character	2	
6	FLOOR	Character	1	
7	WINDOWS	Character	1	
8	HOUSE_OWN	Logical	1	
9	OWNER	Character	1	
10	HOW	Character	10	
11	IMPRESSION	Character	1	
12	VEHICLE	Logical	1	
13	BICYCLE	Character	1	
14	BECAK	Character	1	
15	BULLOCCART	Character	1	
16	HORSECART	Character	1	
Press any key to continue...				
17	MOTORBIKE	Character	1	
18	STATIONETC	Character	1	
19	PICKUP	Character	1	
20	SEDAN	Character	1	
21	TRUCK	Character	1	
22	OTHERVEHIC	Character	10	
23	LIVESTOCK	Logical	1	
24	GOATSHEEP	Numeric	3	
25	CATTLE	Numeric	3	
26	PURPOFCAT	Character	15	
27	WATERBUFF	Numeric	2	
28	PURPOSEWAT	Character	15	
29	CHICKENS	Logical	1	
30	OTHERLIVES	Character	10	
31	HYVCORN	Logical	1	
32	ARJUNA	Logical	1	
Press any key to continue...				
33	C1	Logical	1	
34	CPI1	Logical	1	
35	PIONEER	Logical	1	
36	KALINGGA	Logical	1	
37	HARAPAN	Logical	1	
38	OTHERCORN	Character	10	
39	HYVSOY	Logical	1	
40	WILIS	Logical	1	
41	OTHERSOY	Character	10	
42	HOUSELAND	Character	1	
43	KEBUN	Logical	1	
44	SAWAH	Logical	1	
45	CHILDSAWAH	Logical	1	
46	SAWAHBLOCK	Numeric	2	
47	TEGALAN	Logical	1	
48	CHILDTEGAL	Logical	1	

Press any key to continue...			
49	TEGALBLOCK	Numeric	2
50	RENTSAWAH	Logical	1
51	RENTSBLOCK	Numeric	2
52	PAWNINSAWA	Logical	1
53	PAWNSBLOCK	Numeric	2
54	MAROSAWAH	Logical	1
55	MAROS_ALL	Logical	1
56	MAROS_WHIC	Character	15
57	MAROSBLOCK	Numeric	2
58	MERTELUSAW	Logical	1
59	MERTS_ALL	Logical	1
60	MERTS_WHIC	Character	15
61	MERTSBLOCK	Numeric	2
62	KEDOKPAJES	Logical	1
63	KEDOKS_ALL	Logical	1
64	KEDOKS_WHI	Character	15
Press any key to continue...			
65	KEDOKSBLOC	Numeric	2
66	OTHERSSHAR	Character	20
67	OTHSSHARAD	Memo	10
68	MEMO1	Logical	1
69	TOTALSSHAR	Numeric	2
70	RENTTEGAL	Logical	1
71	RENTTBLOCK	Numeric	2
72	PAWNINTEGA	Logical	1
73	PAWNTBLOCK	Numeric	2
74	MAROTEGAL	Logical	1
75	MAROT_ALL	Logical	1
76	MAROT_WHIC	Character	15
77	MAROTBLOCK	Numeric	2
78	MERTELUTEG	Logical	1
79	MERTT_ALL	Logical	1
80	MERTT_WHIC	Character	15
Press any key to continue...			
81	MERTT_BLOC	Numeric	2
82	KEDOKPAJET	Logical	1
83	KEDOKT_ALL	Logical	1
84	KEDOKT_WHI	Character	15
85	KEDOKTBLOC	Numeric	2
86	OTHERTSHAR	Character	20
87	OTHSARTAD	Memo	10
88	MEMO2	Logical	1
89	TOTALTSHAR	Numeric	2
90	NOTES	Memo	10
91	MEMO3	Logical	1
**	Total	**	346

Structure for database: C:\KUES2-1.dbf

Number of data records: 47

Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	RADIOLISTM	Character	1	
5	RADIOLISTF	Character	1	
6	RADIOWHERM	Character	25	
7	RADIOWHILM	Character	25	
8	RADIOWHERF	Character	25	
9	RADIOWHILF	Character	25	
10	RADIOLANGM	Character	1	
11	RADIOINDOM	Character	1	
12	RADIOLANGF	Character	1	
13	RADIOINDOF	Character	1	
14	PEDESAAN	Character	1	
15	OTHERAGRIC	Character	25	
16	BERITADAER	Character	1	
Press any key to continue...				
17	BERITANAS	Character	1	
18	BERITA	Character	1	
19	LUDRUK	Character	1	
20	KETOPRAK	Character	1	
21	WAYANG	Character	1	
22	SANDIWARA	Character	1	
23	HIBURAN	Character	1	
24	MUSIC	Character	25	
25	RELIGIOUS	Character	25	
26	OTHER	Character	25	
27	RRIMALANG	Logical	1	
28	RRISURABAY	Logical	1	
29	RRIJEMBER	Logical	1	
30	RRISUMENEP	Logical	1	
31	RRIOTHER	Character	20	
32	WONOCOLO	Logical	1	
Press any key to continue...				
33	RKPDKEPANJ	Logical	1	
34	RKPDOTHER	Character	20	
35	ANDALUS	Logical	1	
36	KDS8	Logical	1	
37	JT77	Logical	1	
38	PIONEER	Logical	1	
39	KUTILANG	Logical	1	
40	SENAPUTRA	Logical	1	
41	GT67	Logical	1	
42	SUZANA	Logical	1	
43	PRIVATEOTH	Character	30	
44	TIMEPEDESM	Character	12	
45	TIMEPEDESF	Character	12	
46	TIMEOTHAGM	Character	12	
47	TIMEOTHAGF	Character	12	
48	TIMEBERITM	Character	12	

Press any key to continue...

49	TIMEBERITF	Character	12
50	TIMEHIBURM	Character	12
51	TIMEHIBURF	Character	12
52	TIMERELIGM	Character	12
53	TIMERELIGF	Character	12
54	RADPROGADD	Memo	10
55	MEMO1	Logical	1
56	FAVORITE_M	Character	2
57	REASON_M	Character	30
58	FAVORITE_F	Character	2
59	REASON_F	Character	30
60	REASONADD	Memo	10
61	MEMO2	Logical	1
62	AGPROGRAMM	Logical	1
63	AGPROWHATM	Character	20
64	AGWHYNOTM	Character	30

Press any key to continue...

65	AGPROGRAMF	Logical	1
66	AGPROWHATF	Character	20
67	AGWHYNOTF	Character	30
68	AG_LIKE_M	Character	30
69	AG_LIKE_F	Character	30
70	AG_LIKE_AD	Memo	10
71	MEMO3	Logical	1
72	PRACTICE	Logical	1
73	PRAC_WHAT	Character	30
74	PRAC_PROG	Character	1
75	PRACTICEAD	Memo	10
76	MEMO4	Logical	1
77	OWNRADIO	Logical	1
78	NOTLISTENM	Character	2
79	NOTLISTENF	Character	2
80	NOTES	Memo	10

Press any key to continue...

81	MEMO5	Logical	1
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** total ** 752

Structure for database: C:\KUES2-2.dbf
 Number of data records: 47
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	TV_WATCH_M	Logical	1	
5	TV_WATCH_F	Logical	1	
6	WATCHWHERE	Character	1	
7	OWNIV	Logical	1	
8	NOTWATCH_M	Character	20	
9	NOTWATCH_F	Character	20	
10	TV_ADD	Memo	10	
11	MEMO1	Logical	1	
12	FILM_M	Logical	1	
13	FILM_F	Logical	1	
14	FILM_LASTM	Character	5	
15	FILM_LASTF	Character	5	
16	FILM_WHERM	Character	15	
Press any key to continue...				
17	FILM_WHERF	Character	15	
18	FILM_WHATM	Character	20	
19	FILM_WHATF	Character	20	
20	WHYNOFILMM	Character	2	
21	WHYNOFILMF	Character	2	
22	FILM_FAR	Character	20	
23	FILM_EXPEN	Character	10	
24	FILM_ADD	Memo	10	
25	MEMO2	Logical	1	
26	LITERACY_M	Character	1	
27	LIT_INDO_M	Character	1	
28	LIT_JAV_M	Character	1	
29	LIT_MAD_M	Character	1	
30	LIT_ARAB_M	Character	1	
31	READ_M	Logical	1	
32	LITERACY_F	Character	1	
Press any key to continue...				
33	LIT_INDO_F	Character	1	
34	LIT_JAV_F	Character	1	
35	LIT_MAD_F	Character	1	
36	LIT_ARAB_F	Character	1	
37	READ_F	Logical	1	
38	BOOKS_F	Character	20	
39	MAGAZINE_F	Character	20	
40	NEWSPAPR_F	Logical	1	
41	COMICS_F	Logical	1	
42	LEAFLETS_F	Character	20	
43	AG_INFO_F	Character	20	
44	RELIG_F	Logical	1	
45	BOOKS_M	Character	20	
46	MAGAZINE_M	Character	20	
47	NEWSPAPR_M	Logical	1	
48	COMICS_M	Logical	1	

Press any key to continue...

49	LEAFLETS_M	Character	20
50	AG_INFO_M	Character	20
51	RELIG_M	Logical	1
52	LITER_CHIL	Logical	1
53	READ_CH	Logical	1
54	BOOKS_CH	Character	20
55	MAGAZINE_C	Character	20
56	NEWSPAPR_C	Logical	1
57	COMICS_CH	Logical	1
58	LEAFLETS_C	Character	20
59	AG_INFO_CH	Character	20
60	RELIG_CH	Logical	1
61	PRINTMAT	Logical	1
62	PRINT_WHAT	Memo	10
63	MEMO3	Logical	1
64	LANG_1ST_M	Character	1

Press any key to continue...

65	INDON_M	Character	1
66	LANG_1ST_F	Character	1
67	INDON_F	Character	1
68	LANG_HOME	Character	1
69	NOTES	Memo	10
70	MEMO4	Logical	1

** Total ** 488

Structure for database: C:\KUES2-3.dbf

Number of data records: 47

Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	CORNHYVLAS	Logical	1	
5	CORNLOC1AS	Logical	1	
6	CORNHYV3	Logical	1	
7	CORNLOC3	Logical	1	
8	SOYHYVLAST	Logical	1	
9	SOYLOC1AST	Logical	1	
10	SOYHYV3	Logical	1	
11	SOYLOC3	Logical	1	
12	SAWAH	Logical	1	
13	RICE_S	Logical	1	
14	SUGAR_S	Logical	1	
15	CORN_S	Logical	1	
16	CORNHYV_S	Character	1	
Press any key to continue...				
17	CORNLOC_S	Character	1	
18	CORNWHY_S	Character	30	
19	SOY_S	Logical	1	
20	SOYHYV_S	Character	1	
21	SOYLOC_S	Character	1	
22	SOYWHY_S	Character	30	
23	SOYWHY_SAD	Memo	10	
24	MEMO1	Logical	1	
25	CASSAVA_S	Logical	1	
26	OTHERPAL_S	Character	30	
27	OTHERCROPS	Character	30	
28	EDGES_S	Character	30	
29	LONGTERM_S	Character	15	
30	TEGALAN	Logical	1	
31	RICE_T	Logical	1	
32	SUGAR_T	Logical	1	
Press any key to continue...				
33	CORN_T	Logical	1	
34	CORNHYV_T	Character	1	
35	CORNLOC_T	Character	1	
36	CORNWHY_T	Character	30	
37	CWHY_T_ADD	Memo	10	
38	MEMO2	Logical	1	
39	SOY_T	Logical	1	
40	SOYHYV_T	Character	1	
41	SOYLOC_T	Character	1	
42	SOYWHY_T	Character	30	
43	SWHY_T_ADD	Memo	10	
44	MEMO3	Logical	1	
45	CASSAVA_T	Logical	1	
46	OTHERPAL_T	Character	30	
47	OTHERCROPT	Character	30	
48	EDGES_T	Character	30	

94

Press any key to continue...		
49	LONGTERM_F	Character 15
50	MOSTPROFIT	Character 20
51	MOSTPROFAD	Memo 10
52	MEMO4	Logical 1
53	WHYNOT	Character 20
54	WHYNOTADD	Memo 10
55	MEMO5	Logical 1
56	PROBLEMS	Character 40
57	PROBLEMADD	Memo 10
58	MEMO6	Logical 1
59	LABOR_SELF	Logical 1
60	LABOR_EXCH	Logical 1
61	EXCH_WHAT	Character 15
62	LABOR_WAGE	Logical 1
63	WAGE_WHAT	Character 15
64	LABOR_OTH	Character 1
Press any key to continue...		
65	PBB	Numeric 5
66	METPPL	Character 1
67	CURRENTPPL	Logical 1
68	KNOWNAME	Logical 1
69	LASTMET_M	Character 15
70	LASTMET_F	Character 15
71	OTH_AGEXTN	Logical 1
72	AGEXTN_WHO	Character 30
73	ORGNM_M	Logical 1
74	ORGNM_F	Logical 1
75	TAHLILAN	Character 1
76	PENGAJIAN	Character 1
77	YASINAN	Character 1
78	SHALAWATAN	Character 1
79	ALHIDAYAH	Character 1
80	OTHISLAM_M	Character 20
Press any key to continue...		
81	OTHISLAM_F	Character 20
82	KELTANI	Character 1
83	KELOMPEN	Character 1
84	TARUNATANI	Character 1
85	PKK	Character 1
86	DHARMAWANI	Character 1
87	UPGK	Character 1
88	LKMD	Character 1
89	SISKAMLING	Character 1
90	KARANGTARU	Character 1
91	REMBUGDESA	Character 1
92	KUMP_RT	Character 1
93	KOPERASI_M	Character 20
94	KOPERASI_F	Character 20
95	ARISAN	Character 1
96	RUKUNKEMAT	Character 1

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Press any key to continue...
 97 OTHORGNS_M Character 30
 98 OTHORGNS_F Character 30
 99 MOSTFREQ_M Character 20
100 IS_KELTANI Logical 1
101 KELTANI_M Logical 1
102 KT_WHYNOTM Character 30
103 ISKELOMPEN Logical 1
104 KELOMPEN_M Logical 1
105 KP_WHYNOTM Character 30
106 MOSTFREQ_F Character 20
107 KIWOMEN Logical 1
108 KELTANI_F Logical 1
109 KT_WHYNOTF Character 30
110 KELOMPEN_F Logical 1
111 KP_WHYNOTF Character 30
112 IS_PKK Logical 1
Press any key to continue...
113 PKK_F Logical 1
114 PKK_WHYNOTF Character 30
115 PKK_AG Logical 1
116 AG_WHAT Character 40
117 ORGNS_ADD Memo 10
118 MEMO7 Logical 1
119 NOTES Memo 10
120 MEMO8 Logical 1
*** Total *** 1044

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Structure for database: C:\DUL-A.dbf
 Number of data records: 15
 Date of last update : 01/16/89

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	BLOCKNO	Character	2	
5	AREA_HA	Numeric	5	2
6	AREA_OTHER	Character	10	
7	RENTOUT	Character	4	
8	PERIOD	Character	8	
9	SHAREOUT	Character	4	
10	CULTIVATOR	Character	5	
11	SYSTEM1	Character	7	
12	DIVISION1	Character	4	
13	INPUTS1	Character	5	
14	CROPS1	Character	20	
15	SYSTEM2	Character	7	
16	DIVISION2	Character	4	
Press any key to continue...				
17	INPUTS2	Character	5	
18	CROPS2	Character	15	
19	YRSCULTIV	Numeric	4	1
20	NOTES	Memo	10	
** Total **			146	

Structure for database: C:\DUL-B.dbf

Number of data records: 74

Date of last update : 12/01/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	BLOCKNO	Character	2	
5	AREA_HA	Numeric	5	2
6	AREA_OTHER	Character	10	
7	RENTOUT	Character	4	
8	PERIOD	Character	8	
9	SHAREOUT	Character	4	
10	CULTIVATOR	Character	5	
11	SYSTEM1	Character	7	
12	DIVISION1	Character	4	
13	INPUTS1	Character	5	
14	CROPS1	Character	20	
15	SYSTEM2	Character	7	
16	DIVISION2	Character	4	
Press any key to continue...				
17	INPUTS2	Character	5	
18	CROPS2	Character	15	
19	YRSCULTIV	Numeric	4	1
20	NOTES	Memo	10	
** Total **			146	

Structure for database: C:DUL-C.dbf
 Number of data records: 1
 Date of last update : 12/01/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	BLOCKNO	Character	2	
5	PERIOD	Character	8	
6	AREA_HA	Numeric	5	2
7	AREA_OTHER	Character	10	
8	SHAREOUT	Character	4	
9	CULTIVATOR	Character	5	
10	SYSTEM1	Character	7	
11	DIVISION1	Character	4	
12	INPUTS1	Character	5	
13	CROPS1	Character	20	
14	SYSTEM2	Character	7	
15	DIVISION2	Character	4	
16	INPUTS2	Character	5	
Press any key to continue...				
17	CROPS2	Character	15	
18	NOTES	Memo	10	
** Total **			138	

Structure for database: C:\DUL-D.dbf

Number of data records: 3

Date of last update : 12/01/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	BLOCKNO	Character	2	
5	PERIOD	Character	8	
6	AREA_HA	Numeric	5	2
7	AREA_OTHER	Character	10	
8	SYSTEM1	Character	7	
9	DIVISION1	Character	4	
10	INPUTS1	Character	5	
11	CROPS1	Character	20	
12	SYSTEM2	Character	7	
13	DIVISION2	Character	4	
14	INPUTS2	Character	5	
15	CROPS2	Character	15	
16	NOTES	Memo	10	
**	Total	**	129	

Structure for database: C:\DUI - E.dbf

Number of data records: 7

Date of last update : 12/01/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	BLOCKNO	Character	2	
5	PERIOD	Character	8	
6	AREA_HA	Numeric	5	2
7	AREA_OTHER	Character	10	
8	SHARFOUT	Character	4	
9	CULTIVATOR	Character	5	
10	SYSTEM1	Character	7	
11	DIVISION1	Character	4	
12	INPUTS1	Character	5	
13	CROPS1	Character	20	
14	SYSTEM2	Character	7	
15	DIVISION2	Character	4	
16	INPUTS2	Character	5	
Press any key to continue...				
17	CROPS2	Character	15	
18	NOTES	Memo	10	
** Total **			138	

Structure for database: C:DUL F.dbf

Number of data records: 15

Date of last update : 12/01/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	BLOCKNO	Character	2	
5	PERIOD	Character	8	
6	AREA_HA	Numeric	5	2
7	AREA_OTHER	Character	10	
8	SYSTEM1	Character	7	
9	DIVISION1	Character	4	
10	INPUTS1	Character	5	
11	CROPS1	Character	20	
12	SYSTEM2	Character	7	
13	DIVISION2	Character	4	
14	INPUTS2	Character	5	
15	CROPS2	Character	15	
16	NOTES	Memo	10	
**	Total	**	129	

Structure for database: C:\DUH G-1.dbf

Number of data records: 97

Date of last update : 12/01/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	OWNRENTSHA	Character	1	
5	BLOCKNO	Character	2	
6	LANDTYPE	Character	1	
7	NOWCROP	Logical	1	
8	CORN	Logical	1	
9	CASSAVA	Logical	1	
10	SOY	Logical	1	
11	RICE	Logical	1	
12	SUGARCANE	Logical	1	
13	CHILIFES	Logical	1	
14	OTHERPALAW	Character	20	
15	OTHERCROPS	Character	20	
16	OTHER	Memo	10	
Press any key to continue...				
17	MEMO1	Logical	1	
18	CORNVARHYV	Character	1	
19	CORNVARLOC	Character	1	
20	WILISHYV	Logical	1	
21	SOYOTHYV	Character	10	
22	KUNING	Logical	1	
23	HILJAU	Logical	1	
24	SOYOTHLOC	Character	10	
25	CASSVAR	Character	1	
26	RICEVAR	Character	2	
27	CORNAGEDAY	Numeric	3	
28	CORNPLANT	Character	5	
29	CORNHARV	Character	5	
30	CASSPLANT	Character	5	
31	CASSHARV	Character	5	
32	RICEPLANT	Character	5	
Press any key to continue...				
33	RICEHARV	Character	5	
34	SUGARPLANT	Character	5	
35	SUGARHARV	Character	5	
36	CHILIPLANT	Character	5	
37	OTHPALPLAN	Character	11	
38	OTHPALHARV	Character	11	
39	OTHERPLANT	Character	11	
40	OTHERHARV	Character	11	
41	OTHERPLHAR	Memo	10	
42	MEMO2	Logical	1	
43	INTERCROP	Logical	1	
44	EDGE_CASS	Logical	1	
45	EDGE_TUBER	Character	25	
46	EDGE_OTHPA	Character	20	
47	EDGE_VEG	Character	20	
48	BANANA	Logical	1	

Press any key to continue...

49	COCONUT	Logical	1
50	FRUITTREES	Character	20
51	CLOVE	Logical	1
52	OTHERTREES	Character	20
53	OTHEREDGES	Character	20
54	NOTES	Memo	10
55	MEMO3	Logical	1
**	Total	**	349

Structure for database: C:\DUI G 2.dbf
 Number of data records: 97
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	OWNRENTSHA	Character	1	
5	BLOCKNO	Character	2	
6	LANDTYPE	Character	1	
7	ALLOW	Logical	1	
8	CORN	Logical	1	
9	CASSAVA	Logical	1	
10	SOY	Logical	1	
11	RICE	Logical	1	
12	SUGARCANE	Logical	1	
13	CHILLIES	Logical	1	
14	OTHERPALAW	Character	20	
15	OTHERCROPS	Character	20	
16	OTHER	Memo	10	
Press any key to continue...				
17	MEMO1	Logical	1	
18	CORNVARHYV	Character	1	
19	CORNVARLOC	Character	1	
20	WILFISHYV	Logical	1	
21	SOYOTHYV	Character	10	
22	KUNING	Logical	1	
23	HIJAU	Logical	1	
24	SOYOTHLOC	Character	10	
25	CASSVAR	Character	1	
26	RICEVAR	Character	2	
27	CORNPLANT	Character	5	
28	CORNHARV	Character	5	
29	CASSPLANT	Character	5	
30	CASSHARV	Character	5	
31	RICEPLANT	Character	5	
32	RICEHARV	Character	5	
Press any key to continue...				
33	SUGARPLANT	Character	5	
34	SUGARHARV	Character	5	
35	CHILLIPLANT	Character	5	
36	OTHPALPLAN	Character	11	
37	OTHPALHARV	Character	11	
38	OTHERPLANT	Character	11	
39	OTHERHARV	Character	11	
40	OTHERPLHAR	Memo	10	
41	MEMO2	Logical	1	
42	INTERCROP	Logical	1	
43	NOTES	Memo	10	
44	MEMO3	Logical	1	
** Total **			217	

Structure for database: C:\DUI G 3.dbf
 Number of data records: 97
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RFPNO	Character	2	
3	NAMEKK	Character	11	
4	OWNRENTSHA	Character	1	
5	BLOCKNO	Character	2	
6	LANDTYPE	Character	1	
7	FALLOW	Logical	1	
8	CORN	Logical	1	
9	CASSAVA	Logical	1	
10	SOY	Logical	1	
11	RICE	Logical	1	
12	SUGARCANE	Logical	1	
13	CHILLIES	Logical	1	
14	OTHERPALAW	Character	20	
15	OTHERCROPS	Character	20	
16	OTHER	Memo	10	
Press any key to continue...				
17	MEMO1	Logical	1	
18	CORNVARHYV	Character	1	
19	CORNVARLOC	Character	1	
20	WILISHYV	Logical	1	
21	SOYOTIHYV	Character	10	
22	KUNING	Logical	1	
23	HIJAU	Logical	1	
24	SOYOTILOC	Character	10	
25	CASSVAR	Character	1	
26	RICEVAR	Character	2	
27	CORNPLANT	Character	5	
28	CORNHARV	Character	5	
29	CASSPLANT	Character	5	
30	CASSHARV	Character	5	
31	RICEPLANT	Character	5	
32	RICEHARV	Character	5	
Press any key to continue...				
33	SUGARPLANT	Character	5	
34	SUGARHARV	Character	5	
35	CHILLIPLANT	Character	5	
36	OTHPALPLAN	Character	11	
37	OTHPALHARV	Character	11	
38	OTHERPLANT	Character	11	
39	OTHERHARV	Character	11	
40	OTHERPLHAR	Memo	10	
41	MEMO2	Logical	1	
42	INTERCROP	Logical	1	
43	NOTES	Memo	10	
44	MEMO3	Logical	1	
**	Total	**	217	

Structure for database: C:\DUL G 4.dbf

Number of data records: 97

Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	BLOCKNO	Character	2	
5	LANDTYPE	Character	1	
6	EVERPALA	Logical	1	
7	YEAR	Character	2	
8	EVERCORN	Logical	1	
9	EVERCASS	Logical	1	
10	EVERSOY	Logical	1	
11	EVEROTHER	Character	12	
12	REASONCORN	Character	20	
13	REASONCASS	Character	20	
14	REASONSOY	Character	20	
15	REASONOTH	Character	20	
16	IRRIGSAWAH	Logical	1	
Press any key to continue...				
17	IRRIGTYPE	Character	14	
18	RAINTEGAL	Logical	1	
19	OTHERWATER	Logical	1	
20	SOURCE	Character	20	
21	NOTES	Memo	10	
22	MEMO1	Logical	1	
**	Total	**	164	

Structure for database: C:\DUL H.dbf
 Number of data records: 8
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	VARCORN	Character	12	
5	LANDTYPE	Character	7	
6	AGEDAYSAW	Numeric	3	
7	NOTHARVSAW	Logical	1	
8	HARVMOSAW	Character	5	
9	AGEDAYTEG	Numeric	3	
10	NOTHARVTEG	Logical	1	
11	HARVMOTEG	Character	5	
12	TIMESPLANT	Character	10	
13	RESULT	Character	20	
14	RESULTADD	Memo	10	
15	INFO	Character	20	
16	INFOADD	Memo	10	
Press any key to continue...				
17	SFEN	Logical	1	
18	LOCATION	Character	20	
19	CULTINFO	Character	20	
20	CULTINFADD	Memo	10	
21	SEEDSOURCE	Character	20	
22	DIFFICULT	Logical	1	
23	DIFFIC_HOW	Character	20	
24	DIFFICWHEN	Character	10	
25	FERTILIZE	Character	4	
26	UREA	Logical	1	
27	TSP	Logical	1	
28	KCL	Logical	1	
29	ZA	Logical	1	
30	MANURE	Logical	1	
31	GREEN	Logical	1	
32	OTHERFERT	Character	10	
Press any key to continue...				
33	LEAFFERT	Logical	1	
34	BUYFERT	Character	20	
35	PESTDISEAS	Logical	1	
36	KINDPEST	Character	20	
37	KINDPESTAD	Memo	10	
38	USEPESTIC	Logical	1	
39	PESTICIDE1	Character	10	
40	FORPEST1	Character	20	
41	TIMESUSE1	Numeric	3	1
42	AGEUSEDAY1	Character	10	
43	PESTICIDE2	Character	10	
44	FORPEST2	Character	20	
45	TIMESUSE2	Numeric	3	1
46	AGEUSEDAY2	Character	10	
47	BUYPESTIC	Character	20	
48	NOTES	Memo	10	
**	Total	**	425	

Structure for database: C:\DUI\J.dbf
 Number of data records: 5
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO.	Character	2	
3	NAMEKK	Character	11	
4	VARCORNHYV	Character	12	
5	VARCORNLOC	Character	12	
6	LANDTYPE	Character	7	
7	AGEDAYSAW	Numeric	3	
8	NOTHARVSAW	Logical	1	
9	HARVMOSAW	Character	5	
10	AGEDAYTEG	Numeric	3	
11	NOTHARVTEG	Logical	1	
12	HARVMOTEG	Character	5	
13	TIMESPLANT	Character	10	
14	RESULT	Character	20	
15	RESULTADD	Memo	10	
16	WHYNOTNOW	Character	20	
Press any key to continue...				
17	WHYNOTADD	Memo	10	
18	INFO	Character	20	
19	INFOADD	Memo	10	
20	SEEN	Logical	1	
21	LOCATION	Character	20	
22	CULTINFO	Character	20	
23	CULTINFADD	Memo	10	
24	SEEDSOURCE	Character	20	
25	DIFFICULT	Logical	1	
26	DIFFICHOW	Character	20	
27	DIFFICWHEN	Character	10	
28	FERTILIZE	Character	4	
29	VARCORN	Character	12	
30	UREA	Logical	1	
31	TSP	Logical	1	
32	KCL	Logical	1	
Press any key to continue...				
33	ZA	Logical	1	
34	MANURE	Logical	1	
35	GREEN	Logical	1	
36	OTHERFERT	Character	10	
37	LEAFFERT	Logical	1	
38	BUYFERT	Character	20	
39	PESTDISEAS	Logical	1	
40	KINDPEST	Character	20	
41	KINDPESTAD	Memo	10	
42	USEPESTIC	Logical	1	
43	PESTICIDE1	Character	10	
44	FORPEST1	Character	20	
45	TIMESUSE1	Numeric	3	
46	AGEUSEDAY1	Character	10	
47	PESTICIDE2	Character	10	
48	FORPEST2	Character	20	

Press any key to continue...

49	TIMESUSE2	Numeric	3	1
50	AGEUSEDAY2	Character	10	
51	BUYPESTIC	Character	20	
52	NOTES	Memo	10	
**	Total	**	479	

Structure for database: C:\DUL.K.dbf
 Number of data records: 33
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	VARCORN	Character	12	
5	LANDTYPE	Character	7	
6	AGEDAYSAW	Numeric	3	
7	NOTHARVSAW	Logical	1	
8	HARVMOSAW	Character	5	
9	AGEDAYTEG	Numeric	3	
10	NOTHARVTEG	Logical	1	
11	HARVMOTEG	Character	5	
12	ANYHYVCORN	Character	9	
13	RESULTSFEN	Character	11	
14	RESULTADD	Memo	10	
15	WHYNOT	Character	20	
16	WHYNOTADD	Memo	10	
Press any key to continue...				
17	FERTILIZE	Character	4	
18	UREA	Logical	1	
19	TSP	Logical	1	
20	KCL	Logical	1	
21	ZA	Logical	1	
22	MANURE	Logical	1	
23	GREEN	Logical	1	
24	OTHERFERT	Character	10	
25	LEAFFERT	Logical	1	
26	BUYFERT	Character	20	
27	PESTDISEAS	Logical	1	
28	KINDPEST	Character	20	
29	KINDPESTAD	Memo	10	
30	USEPESTIC	Logical	1	
31	PESTICIDE1	Character	10	
32	FORPEST1	Character	20	
Press any key to continue...				
33	TIMESUSE1	Numeric	3	1
34	AGEUSEDAY1	Character	10	
35	PESTICIDE2	Character	10	
36	FORPEST2	Character	20	
37	TIMESUSE2	Numeric	3	1
38	AGEUSEDAY2	Character	10	
39	BUYPESTIC	Character	20	
40	NOTES	Memo	10	
** Total **			313	

Structure for database: C:\DUI 1.dbf

Number of data records: 4

Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RFPNO	Character	2	
3	NAMFKK	Character	11	
4	CORNLOCAL 1	Character	10	
5	CORNLOCAL 2	Character	10	
6	CORNHYV1	Character	8	
7	CORNHYV2	Character	8	
8	HARVESTLOC	Character	14	
9	HARVESTHYV	Character	14	
10	SOLDIMMLOC	Logical	1	
11	ALL LOC	Logical	1	
12	BITBYBITLO	Logical	1	
13	STORELOC	Logical	1	
14	CONSUMELOC	Logical	1	
15	MONTHSLOC	Numeric	4	1
16	SOLDIMMHYV	Logical	1	
Press any key to continue...				
17	ALL HYV	Logical	1	
18	BITBYBITHY	Logical	1	
19	STOREHYV	Logical	1	
20	CONSUMEHYV	Logical	1	
21	MONTHSHYV	Numeric	4	1
22	PURCHASER	Character	20	
23	PURCHASADD	Memo	10	
24	SAME	Character	7	
25	GOTOPURCH	Character	8	
26	TRANSPSEFF	Character	8	
27	VEHICLE	Character	10	
28	OWNVEHICLE	Logical	1	
29	HOW	Character	9	
30	WHERE	Character	20	
31	PRICE LOC	Character	20	
32	PRICE HYV	Character	20	
Press any key to continue...				
33	PRICE ADD	Memo	10	
34	COMPARELOC	Character	20	
35	COMPAREHYV	Character	20	
36	COMPAREADD	Memo	10	
37	MONEYSOURC	Character	30	
38	SHORTMONEY	Logical	1	
39	IFSHORTDO	Character	20	
40	OTHERSDO	Character	20	
41	CREDITLOAN	Logical	1	
42	SOURCECRED	Character	15	
43	SOURCELOAN	Character	15	
44	FORMCREDIT	Character	10	
45	FORMLOAN	Character	10	
46	EVTRCREDIT	Logical	1	
47	WHEREFCREDI	Character	15	
48	PACKET	Logical	1	

Press any key to continue...

49	EVERLOAN	Logical	1
50	NOTES	Memo	10
**	Total	**	452

Structure for database: C:DUL M.dbf

Number of data records: 5

Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	CORNHYV1	Character	8	
5	CORNHYV2	Character	8	
6	HARVEST	Character	14	
7	SOIDIMM	Logical	1	
8	ALL	Logical	1	
9	BITBYBIT	Logical	1	
10	STORE	Logical	1	
11	CONSUME	Logical	1	
12	MONTHS	Numeric	4	1
13	PURCHASER	Character	20	
14	PURCHASADD	Memo	10	
15	SAMFPURCH	Character	7	
16	GOTOPURCH	Character	8	
Press any key to continue...				
17	TRANSPSELF	Character	8	
18	VEHICLE	Character	10	
19	OWNVEHICLE	Logical	1	
20	HOW	Character	1	
21	TOWHERE	Character	20	
22	PRICE	Character	20	
23	PRICE_ADD	Memo	10	
24	COMPARE	Character	20	
25	COMPAREADD	Memo	10	
26	MONEYSOURC	Character	30	
27	SHORTMONFY	Logical	1	
28	IFSHORTDO	Character	20	
29	OTHERSDO	Character	20	
30	CREDITLOAN	Logical	1	
31	SOURCECRED	Character	15	
32	SOURCELOAN	Character	15	
Press any key to continue...				
33	FORMCREDIT	Character	10	
34	FORMLOAN	Character	10	
35	EVERCREDIT	Logical	1	
36	WHERECREDI	Character	15	
37	PACKET	Logical	1	
38	EVERLOAN	Logical	1	
39	NOTES	Memo	10	
**	Total	**	361	

Structure for database: C:\DUL\N.dbf
 Number of data records: 36
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	CORNLOC1	Character	8	
5	CORNLOC2	Character	8	
6	HARVEST	Character	14	
7	SOLDIMM	Logical	1	
8	ALL	Logical	1	
9	BITBYBIT	Logical	1	
10	STORE	Logical	1	
11	CONSUME	Logical	1	
12	MONTHS	Numeric	4	1
13	PURCHASER	Character	20	
14	PURCHASADD	Memo	10	
15	SAMEPURCH	Character	7	
16	GOTOPURCH	Character	8	
Press any key to continue...				
17	TRANSPSELF	Character	8	
18	VEHICLE	Character	10	
19	OWNVEHICLE	Logical	1	
20	HOW	Character	1	
21	TOWHERE	Character	20	
22	PRICE	Character	20	
23	PRICE_ADD	Memo	10	
24	MEMO1	Logical	1	
25	COMPARE	Character	20	
26	COMPAREADD	Memo	10	
27	MEMO2	Logical	1	
28	MONEY SOURC	Character	30	
29	SHORTMONEY	Logical	1	
30	IFSHORTDO	Character	20	
31	OTHERSDO	Character	20	
32	CREDITLOAN	Logical	1	
Press any key to continue...				
33	SOURCECRED	Character	15	
34	SOURCELOAN	Character	15	
35	FORMCREDIT	Character	10	
36	FORMLOAN	Character	10	
37	EVERCREDIT	Logical	1	
38	WHERECREDI	Character	15	
39	PACKET	Logical	1	
40	EVERLOAN	Logical	1	
41	NOTES	Memo	10	
42	MEMO3	Logical	1	
** Total **			352	

Structure for database: C:\DUL -0.dbf
 Number of data records: 1
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	VARSOY	Character	12	
5	LANDTYPE	Character	7	
6	AGEDAYSAW	Numeric	3	
7	NOIHARVSAW	Logical	1	
8	HARVMOSAW	Character	5	
9	AGEDAYTEG	Numeric	3	
10	NOIHARVTEG	Logical	1	
11	HARVMOTEG	Character	5	
12	TIMESPLANT	Character	10	
13	RESULT	Character	20	
14	RESULTADD	Memo	10	
15	INFO	Character	20	
16	INFOADD	Memo	10	
Press any key to continue...				
17	SEEN	Logical	1	
18	LOCATION	Character	20	
19	CULTINFO	Character	20	
20	CULTINFADD	Memo	10	
21	SEEDSOURCE	Character	20	
22	DIFFICULT	Logical	1	
23	DIFFIC_HOW	Character	20	
24	DIFFICWHEN	Character	10	
25	FERTILIZE	Character	4	
26	UREA	Logical	1	
27	TSP	Logical	1	
28	KCL	Logical	1	
29	ZA	Logical	1	
30	MANURE	Logical	1	
31	GRFEN	Logical	1	
32	OTHERFERT	Character	10	
Press any key to continue...				
33	LEAFFERT	Logical	1	
34	BUYFERT	Character	20	
35	PESTDISEAS	Logical	1	
36	KINDPEST	Character	20	
37	KINDPESTAD	Memo	10	
38	USEPESTIC	Logical	1	
39	PESTICIDE1	Character	10	
40	FORPEST1	Character	20	
41	TIMESUSE1	Numeric	3	1
42	AGEUSEDAY1	Character	10	
43	PESTICIDE2	Character	10	
44	FORPEST2	Character	20	
45	TIMESUSE2	Numeric	3	1
46	AGEUSEDAY2	Character	10	
47	BUYPESTIC	Character	20	
48	NOTES	Memo	10	
** Total **			425	

Structure for database: C:DUL-R.dbf

Number of data records: 7

Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RFSPNO	Character	2	
3	NAMEKK	Character	11	
4	VARSOY	Character	12	
5	LANDTYPE	Character	7	
6	AGEDAYSAY	Numeric	3	
7	NOTHARVSAW	Logical	1	
8	HARVMOSAW	Character	5	
9	AGEDAYTEG	Numeric	3	
10	NOTHARVTEG	Logical	1	
11	HARVMOTEG	Character	5	
12	ANYHYVSOY	Character	9	
13	RESULTSEEN	Character	11	
14	RESULTADD	Memo	10	
15	WHYNOT	Character	20	
16	WHYNOTADD	Memo	10	
Press any key to continue...				
17	FERTILIZE	Character	4	
18	URFA	Logical	1	
19	TSP	Logical	1	
20	KCL	Logical	1	
21	ZA	Logical	1	
22	MANURE	Logical	1	
23	GREEN	Logical	1	
24	OTHERFERT	Character	10	
25	LEAFFERT	Logical	1	
26	BUYFFRT	Character	20	
27	PESTDISEAS	Logical	1	
28	KINDPEST	Character	20	
29	KINDPESTAD	Memo	10	
30	USEPESTIC	Logical	1	
31	PESTICIDE1	Character	10	
32	FORPEST1	Character	20	
Press any key to continue...				
33	TIMESUSE1	Numeric	3	1
34	AGEUSEDAY1	Character	10	
35	PESTICIDE2	Character	10	
36	FORPEST2	Character	20	
37	TIMESUSE2	Numeric	3	1
38	AGEUSEDAY2	Character	10	
39	BUYPESTIC	Character	20	
40	NOTES	Memo	10	
** Total **			313	

Structure for database: C:\DUI 1.dbf
 Number of data records: 1
 Date of last update : 11/28/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	13	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	SOYHYV1	Character	8	
5	SOYHYV2	Character	8	
6	HARVEST	Character	14	
7	SOLDIMM	Logical	1	
8	ALI	Logical	1	
9	BITBYBIT	Logical	1	
10	STORE	Logical	1	
11	USE	Logical	1	
12	PURCHASER	Character	20	
13	PURCHASADD	Memo	10	
14	SAMEPURCH	Character	7	
15	GOTOPURCH	Character	8	
16	TRANSPSELF	Character	8	
Press any key to continue...				
17	VEHICLE	Character	10	
18	OWNVEHICLE	Logical	1	
19	HOW	Character	1	
20	TOWHERE	Character	20	
21	PRICE	Character	20	
22	PRICE_ADD	Memo	10	
23	COMPARE	Character	20	
24	COMPAREADD	Memo	10	
25	MONEYSOURC	Character	30	
26	SHORTMONEY	Logical	1	
27	IFSHORTDO	Character	20	
28	OTHERSDO	Character	20	
29	CREDITLOAN	Logical	1	
30	SOURCECRFD	Character	15	
31	SOURCELOAN	Character	15	
32	FORMCREDIT	Character	10	
Press any key to continue...				
33	FORMLOAN	Character	10	
34	EVERCREDIT	Logical	1	
35	WHERECREDI	Character	15	
36	PACKET	Logical	1	
37	EVERLOAN	Logical	1	
38	NOTES	Memo	10	
** Total **			357	

Structure for database: C:\DUL-U.dbf
 Number of data records: 7
 Date of last update : 12/02/88

Field	Field Name	Type	Width	Dec
1	VILLAGE	Character	1	
2	RESPNO	Character	2	
3	NAMEKK	Character	11	
4	SOYLOC1	Character	8	
5	SOYLOC2	Character	8	
6	HARVEST	Character	14	
7	SOIDIMM	Logical	1	
8	ALL	Logical	1	
9	BITBYBIT	Logical	1	
10	STORE	Logical	1	
11	USE	Logical	1	
12	PURCHASER	Character	20	
13	PURCHASADD	Memo	10	
14	SAMEPURCH	Character	7	
15	GOTOPURCH	Character	8	
16	TRANSPSELF	Character	8	
Press any key to continue...				
17	VEHICLE	Character	10	
18	OWNVEHICLE	Logical	1	
19	HOW	Character	1	
20	TOWHERE	Character	20	
21	PRICE	Character	20	
22	PRICE_ADD	Memo	10	
23	MEMO1	Logical	1	
24	COMPARE	Character	20	
25	COMPAREADD	Memo	10	
26	MEMO2	Logical	1	
27	MONEYSOURC	Character	30	
28	SHORTMONEY	Logical	1	
29	IFSHORTDO	Character	20	
30	OTHERSDO	Character	20	
31	CREDITLOAN	Logical	1	
32	SOURCECRED	Character	15	
Press any key to continue...				
33	SOURCELOAN	Character	15	
34	FORMCREDIT	Character	10	
35	FORMLOAN	Character	10	
36	EVERCREDIT	Logical	1	
37	WHERECREDI	Character	15	
38	PACKET	Logical	1	
39	EVERLOAN	Logical	1	
40	NOTES	Memo	10	
41	MEMO3	Logical	1	
** Total **			348	