309.2 S49
497-245
4970245006202
4970245 (3)
PD-AAO-854-A1
87p
final report
Feas. Study

SOCIAL SOUNDNESS ANALYSIS

LOWER CITANDUY/CISEEL RIVER BASINS

INDONESIA

109

Submitted to

THE AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C.

1016 1969

By

LOUIS BERGER INTERNATIONAL, INC.
East Orange, New Jersey 07019

July 1976 7-1-76

IQC Project
Number P10/T/498/249-3-6868042

Contract No. AID/AFR-C-1132

Call Order No. 7

LOUIS BERGER INTERNATIONAL, INC.

Architects - Engineers - Economists - Planners
100 HALSTED STREET, EAST ORANGE, N. J. 07019
TELEPHONE (201) 678-1960
TELEX: 130-152 CABLE: BERGERENG

July 26, 1976

Agency for International Development
Department of State
2201 "C" Street, N.W.
Washington, D.C. 20006

Dear Sirs:

Attached is a copy of our final report "Social Soundness Analysis, Lower Citanduy/Ciseel River Basins, Indonesia." This report was prepared under the AID/Afr-C-1132 IQC Contract, Call Order No. 7, Project No. PIO/T/498/249-3-6868042.

Immediately following the signing of the contract Dr. George Hill, a principal staff member of Louis Berger International, Inc., began evaluating the data for the social soundness analysis of the survey he undertook in Indonesia. The initial report was prepared under Call Order No. 2 of the same contract. Dr. Hill worked on this project at the University of Wisconsin and East Orange, New Jersey where the final report was produced.

Sincerely yours,

Louis Berger

Louis Berger
President

THE PRESIDENT'S "E" AWARD — FOR OUTSTANDING CONTRIBUTIONS TO THE EXPORT EXPANSION PROGRAM OF THE UNITED STATES

PREFACE

To facilitate fluid reading, this Monograph has been arranged so that Tables follow the text.

TABLE OF CONTENTS

	PAGE
I. SUMMARY	1
A. Social Feasibility	1
B. Spread Effect	6
C. Social-Among Other Groups	7
D. General Conclusions	13
II. INTRODUCTION AND BACKGROUND	15
A. Purpose and Objectives	15
B. Organization of Data	16
III. HUMAN AND SOCIAL RESOURCES OF BASIN FARMERS	20
A. Family Composition	20
B. Education	21
IV. FARM ENTERPRISES IN THE BASIN	24
A. Numbers and Size	24
B. Irrigation	26
C. Production, Productivity, Consumption and Inputs	28
V. LABOR PATTERNS	34
A. Family Labor Force	34
B. General Labor Force	34
VI. FARMERS' ORGANIZATIONS	40
A. AES Sponsored	40
B. Sources of Innovation Stimuli	46

TABLE OF CONTENTS (CONT'D)

LIST OF TABLES

Table 1	Age of Household Head and Tenure Status
Table 2	Age of Household Head and Sawah Land Area
Table 3	Household Head and Education
Table 4	Education of Household Head and Number Older Children at Home in School
Table 5	Occupational Choices of Older Children and Education of Household Head
Table 6	Educational Level and Tenure Status, Heads of Households
Table 7	Farms, by Size (Ha.) and Number Kabupaten Ciamis
Table 8	Types of Farm Enterprises
Table 9	Total Area of Sawah Land
Table 10	Classification of Irrigation Systems According to Desa
Table 11	Crop Production Rations and Type of Irrigation Facility
Table 12	Crop Production Rations and Farm Size
Table 13	Proportions of Rice Consumed at Home and Sold, by Tenure Class
Table 14	Choice of Seed Varieties as Related to Area of Planting (Has.)
Table 15	Harvest Labor Use According to Land Management Class
Table 16	Harvest Labor Use According to Farm Size (Ha.)
Table 17	Labor Patterns in Threshing and Grinding
Table 18	Labor Patterns in Ploughing According to Land Management Class
Table 19	Labor Patterns in Ploughing According to Size of Farm
Table 20	Daily Wage Rates Paid Plough Labor
Table 21	Membership in Farmers' Clubs by Tenure Class
Table 22	Membership in Farmers' Clubs by Size of Enterprise (Ha.)
Table 23	Farmer Indicated Sources of Innovation According to Tenure

SOCIAL SOUNDNESS ANALYSIS

LOWER CITANDUY/CISEEL RIVER BASINS

INDONESIA

I. SUMMARY

The Consultant was contracted to make a "social soundness" evaluation of a proposed US/AID project to plan and design flood control and irrigation facilities in Indonesia. The contract called for two reports, one to be submitted within 5 weeks of the Consultant's arrival in Indonesia and the other within 10 weeks. Both reports were submitted 26 November 1975 and 7 January 1976, respectively. Prior to submittal of the second report it was requested of US AID/Indonesia, 24 December 1975, that they consider the Consultant's forthcoming report as preliminary - factors beyond the control of either contracting parties had delayed field work so that insufficient time remained after its completion for analysis. US AID/Indonesia accordingly recommended to Washington that an extension of the contract be given to allow the Consultant to make the final report; authorization was given 10 May 1976, and resulted in this consolidated report.

Among other provisions and conditions in the Consultant's contract were a series of questions, whose answers would provide the salient points from which an evaluation of the social soundness of the project could be made. Detailing of these data provides a convenient manner by which some of the more important conclusions of the survey can be summarized.

A. Sociocultural Feasibility

How are people, social groups, and institutions likely to accept the project within their own cultural context? What do they perceive as benefits and losses?

The applicability of the foregoing questions need to be considered within the political-cultural milieu. As phrased, the questions imply that governing processes result only from long and diverse public discussion of issues. Since this is only partially the case under study, the questions must be considered accordingly.

The development project's first priority is the construction of almost 200 kilometers of levees on the two rivers to control annual floods, and secondly to rehabilitate existing irrigation systems and construct new ones. The field work of this study was primarily conducted (with these priorities in mind) within portions of two Indonesian provinces, Central and West Java. The rivers form parts of the boundaries between the two provinces. Provincial governors exercise considerable authority in their respective regions. While the Government of Indonesia (GOI) created the Citanduy Project Steering Committee to provide coordination between government agencies at the national level, great and easily discernible differences were observed in the effectiveness of programs implementated by the Project Office which is headquartered in Banjar, West Java, the largest city in the project area. Two sub-districts that lie in the project area of Central Java were sampled

to provide evaluative data for the Consultant, but the scant information they yielded only showed that the districts and their farmers were part of the Citanduy project.

This is not to say farmers in Central Java were indifferent on matters of flood control and irrigation, but the plans and programs that were discussed were done so within existing provincial irrigation, soil conservation, and extension programs and had little to do with Citanduy Project plans or proposals.

This is in marked contrast to the district of Ciamis in West Java where most of the project area is located. The enthusiasm for the project varied from village to village. Some of the Camats and Kuwus insisted on accompanying the team in its visits to the outlying villages, even if this meant hiking up mountain trails to reach them (the longest hike was 3 kilometers). Such leaders had previously carried the message of directed change to their villagers and were well able and desirous of demonstrating the effectiveness of on-going programs. This enthusiasm had carried over from the political to the development officers who were responsible for the organization and promotion of agricultural extension programs. In some villages, when agents directing changes found enough local farmers willing and interested in working to correct deficiencies, these agents went far beyond their normal work requirements.

Although it might seem odd, the most convincing evidence of the results of local leadership, with the help of a hard working agent in the promotion of extension activities, was found in communities that were the most islolated. In contrast, the poorest performance was found in the most accessible of communities. When criticism of activities was encountered in these communities, officials tried to promote flood control or irrigation work as their prerogatives. They did not ask for the opinions and help of the farmers who were to be the beneficiaries of the programs. The villagers did not take part in these programs.

Forty-one percent of those interviewed lived in villages having Water Users' Associations (WUA) - 28 percent had memberships in these associations, but 13 percent did not. The majority, 59 percent, stated that Water Users' Associations were not available, or that they were ignorant of their existence or function. In reply to a question of participation in community improvement meetings, 64 percent replied in the affirmative. Attempts to solicit information as to the degree of this "participation" by asking for details of programs they themselves had discussed resulted in failure. A probable conclusion that can be drawn is "apparently meetings were held primarily to announce government plans rather than to solicit opinions and suggestions." This was supported by replies such as, "I go to the meetings to listen." Perhaps the inability of interviewees to answer questions posed by the team indicated non-comprehension, but it could also mean that they, too, did not attend meetings to participate, but to listen.

Will people and social groups (e.g., Farmers and Water Users' Associations) accept and use the training, techniques and organization necessary for implementation of the project? Will O & M by WUA in the lowland irrigation development areas be effective? Will the upland and water management program be effective?

The first of this series of questions were partially answered above. It should be added that WUA's are officially acknowledged to be organized in both West Java and Central

Java, and are known by the popular names of "Mitra Cai" and "Dharma Tirta," respectively. While the official publications also acclaim that the WUA's are more successful in Central rather than in West Java, the limited field work in this province could not corroborate the official observation. If by "better" it is meant they are more numerous and have more systematic operational procedures, then undoubtedly WUA's are more successful in Central Java. Field work, however, bears out the fact that the administration of WUA's is more rigidly controlled in Central Java, but they lacked the spontaneity of farmers' associations.

If paid up membership is used as the criterion, the most successfully operated WUA's were those in which the water users were substantially in control of operations and maintenance.

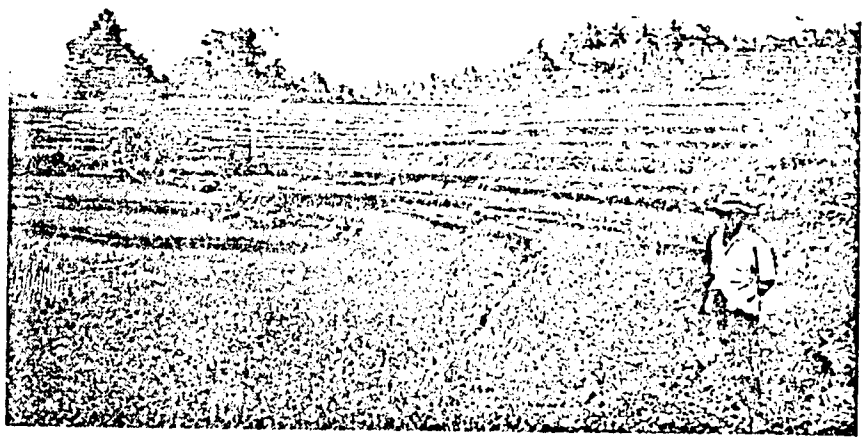
To answer the probable effectiveness of O & M operations in the lowland irrigation projects one should ask why irrigation facilities started under the era of Japanese occupation, and subsequently taken over by the GOI, have so uniformly failed? The main canals and dikes built at great expense were haphazardly maintained in post World War II years.

Answer to the third question concerning the upper Citanduy Ciseel River systems will be attempted in two parts. (1) To retire slope land from cultivation in order to promote soil conservation of water sheds is entirely feasible when acceptable alternative employment opportunities are at hand for the labor force now employed in slope cultivation. Most of those who practice the tilling of hilly lands were found to be of the lowest economic class, quite often newly-married offspring of the smallest farmers who, as is the custom, tried but could not provide part of their small paddy as dowry plots to the new couple. Not having the money to buy good lowland and having no other training or work experience they have chosen the most hazardous of farming opportunities -- dry-land slope farming. Their resources do not permit them to practice tree-crop farming, with its long waiting period of non-producing years, so they chance annual cropping. An acceptable employment opportunity for these rice farmers could be found if they were helped to acquire some of the extensive areas of lowlands now being share-cropped.

(2) Bangunharja and Sengkong are two Kampongs in the upper Citanduy/Ciseel River system in which farmers are trying to irrigate valley lands in the highlands. These lands suffer from rapid runoff rain waters, resulting in severe erosion. The farmers of Bangunharja are successfully farming mountain slopes through a weir and canal system wholly constructed on their own initiative and financial resources. Bangunharja has a successful WUA the second highest of all villages studied, in which participating farmers are fully paid-up members, and of the 21 farmers interviewed in the sample they yielded a cropping intensity of 180 percent in 1974. Only .75 percent of the dry-season rice harvested area was lost because of the insufficiency of water, and only .8 percent of the wet-season harvest was lost because of excess water, or plant diseases common to the wet season. In contrast, Sengkong had 48.9 percent of the planted land area destroyed by droughts in the dry season, and 51.1 percent destroyed by floods in the 1974 wet season. However, many Sengkong farmers supported themselves through supplemental seasonal farm work in other villages, and through the sale of coconuts and other upland tree crops.

Neither of the villages in the project area have yet seen any Citanduy Project personnel or activity. Bangunharja could well serve as a demonstration village for Proyec personnel

Mountain Terracing and Farm Ditch



Mountain Terraces and Upland Crops

so they might observe what villagers, stimulated by local leadership, with a "Gotong Royong" (neighbor-work exchange and mutual-aid pattern) spirit, can accomplish with the help of a willing agent who makes weekly day-long visits from the Kecamatan Agricultural Extension office.

As for Sengkong, with a cropping index of only 100 percent and the average hectareage per farm of sawah land only .28 hectares, it is difficult to see how rehabilitation of the village farming system can be accomplished in situ. If the one household in the sample of 28, that had one hectare of sawah, is removed from the total households interviewed, this will leave an average size of .25 hectares for the remainder.

In the wet season, the only entrance into the village is along a three-kilometer foot trail.

Sengkong is typical of the villages in the upper basin area where the only logical course is to move families out of the village, by planned recruitment, thus leaving the remaining suitable land to form more economic-sized units. These two village case studies illustrate the problems encountered in upland and water management, and how they can be mitigated or overcome.

How can existing social groups and institutions be used or adapted to implement the project?

When WUA's that serve villages in which irrigation systems are established largely through their labor and financial contributions as compared to those officially created and publicly financed, the evidence is clear -- farmers benefit more, use to a greater degree, and maintain more conscientiously the systems in whose operation they have a voice and in whose costs they share. In Puhurwaja, only 3 of the 36 household heads claimed membership in their local WUA. The privately dug ditch which carried water to the plots of rice of the non-members was clean of weeds and maintained, while the official canal running alongside was not.

In Desa Bantarpanjang, located in the sub-district of Cimanggu, four diesel, 4-inch, pumps provided water for 80 hectares of sawah, not enough for all the lands of WUA members. The production ratio among the sample interviewed was 1.7 (i.e. corresponding closely to a cropping index of 170 percent). Although this is a high ratio, it would have been 2.0 had more water been made available through other facilities. Members now are amortizing the cost of their pump installations at Rp. 25,000 yearly; therefore, there is reason to believe that with more water to distribute the present WUA could be enlarged and made even more effective than it is at present.

WUA's are social groups that can and do carry out projects, but only when users have sufficient voice in their functioning, not when their establishment resulted from fiat.

Other social groups -- Farmers' Clubs, Farm Women's Clubs, Farm Youth Clubs -- are weak, mostly non-existent and usually associated with the presence or absence of an Agricultural Extension Service (AES) or agent willing to work with farmers in their Kampongs. Only 34 percent of the farmers sampled had membership in a Farmers' Club, 41 percent stated they did not belong to the club in their village, and the remaining

26 percent were either ignorant of the meaning of a "Farmers' Club" or stated there were none in their communities. Among farmers' wives, only 16 percent were reported by their husbands to have membership in a Farm Women's Club, 42 percent answered in the negative, and the remaining 42 percent did not know the meaning of such a social group or stated that none was available.

Farm Youth Clubs, similar to the 4-H and F.F.A. in the U.S., were non-existent except in one sample village, so that only a small percentage (4%) of the sample stated that their children belonged to such a club. Most interviewees construed images only of the Boy Scouts or sports clubs when youth activities were inquired into. That youth might be grouped into purposive crop, livestock, or home making organizations, was a novel idea. Although some of the respondents said their children's teachers, having petani (peasant) farm backgrounds themselves, imparted innovative ideas to their students.

It is unfortunate that it is in this area of group activity and organization in which the AES lags so far behind. Certainly, AES leaders have in many cases studied agriculture in countries where innovative education is promoted efficiently today through this new institutional process. The cooperative movements in Denmark, Sweden, and Finland were among the first to create the group approach, and it is now the leading technique in the extension services found in the United States.

Club projects were visited in villages where unbound enthusiasm prevailed among their members, and leaders who obviously were proud of their clubs' activities. The active participation of the Desa headman, Kuwu, jointly with his farm officer, the PTD, and often with the enthusiastic backing of a Kecamatan Camat and his PPL, were always associated with successful clubs. There is no defensible apparent reason why this "success" should not be universal in the Basin's AES system; its correction does not live in the granting of more third country fellowships.

What conflicts might arise out of the project?

One conflict has already been referred to -- merely an irritant -- the lack of assistance and cooperation from one of the two provincial administrations located within the area of the project. This probably resulted from the project's center of operations which lies within the competing province.

If general apathy signals the beginning of "conflict," and with the inability of the project to enlist farmer participation, finished canals may receive no more supervision in their O & M than did the post World War II infrastructure program in the same area. Since the project's technical staff is not reaching and working through farmers, the impact of the imposed project design by the "experts" upon farmers was not measureable. It is difficult to see what conflict can arise from the building of levees to control flooding, whereas the provision of irrigation diversion dams and canals are areas where conflict can occur, if such construction favors the benefiting of some over the welfare of all.

The allocation of road building and improvement projects is another potential conflict area. It should be made clear that at the time of the evaluation study the project was then only in its design stage and since the feasibility phase did not concern itself with

public opinion, the general level of ignorance concerning the project's end product has not been conducive to the creation of measureable issues, pro or con.

B. Spread Effect

What is the likelihood that new practices or institutions introduced by this project will be diffused among other groups?

The answer to this question has to be largely in terms of probable practices because at the time of evaluation "new practices or institutions" were so few or only tentatively introduced that an evaluation by the Consultant was premature. A practice that is set forth in the Master Plan of the Project, prepared by Engineering Consultants, Inc. (ECI), is the labor-intensive construction method in flood control and irrigation. Basing this recommendation on what was observed in Bangunharja, and in some other villages previously described, it might be better for the consulting engineers to select their initial work projects in villages where the "Gotong Royong" spirit was known to be practiced and is effective.

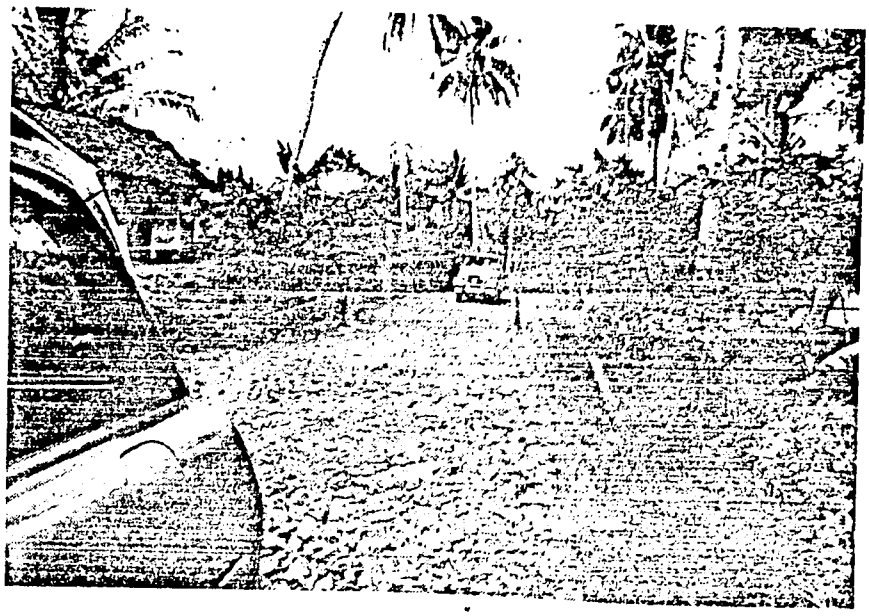
Farm feeder road building is one choice among many that can illustrate what has just been said, The River Cilonje is a raging torrent in the rainy season so that for many months of the year the Desa Bangunharja (with its more than 8,000 inhabitants) is isolated from the outside, unless one risks wading the river. Goods, however, cannot be transported into the desa-complex of Kampongs, or agricultural products sent out during the winter. After 5 years of volunteer "Gotong Royong" labor of the villagers and technical supervision provided by the district engineer, a series of sturdy stone and concrete pillars stand across the valley, hopefully to support steel-concrete spans. With modest help from the Project a year-round farm service road would become a reality.

In contrast to this self-help illustration other publicly-supported and capital-intensive efforts at bridge building can be seen in the project area. Some government program has long since dumped steel trestles and spans that some day are intended to span the designated rivers. That "some day" is already so many years overdue that the trestles can only be seen if the brush is cleared away; when a benevolent public agency will appear to do the job, is not known.

One effective means of stimulating spread-effects would be through the Project building onto the start of village self-help projects and thus rewarding them for their efforts.

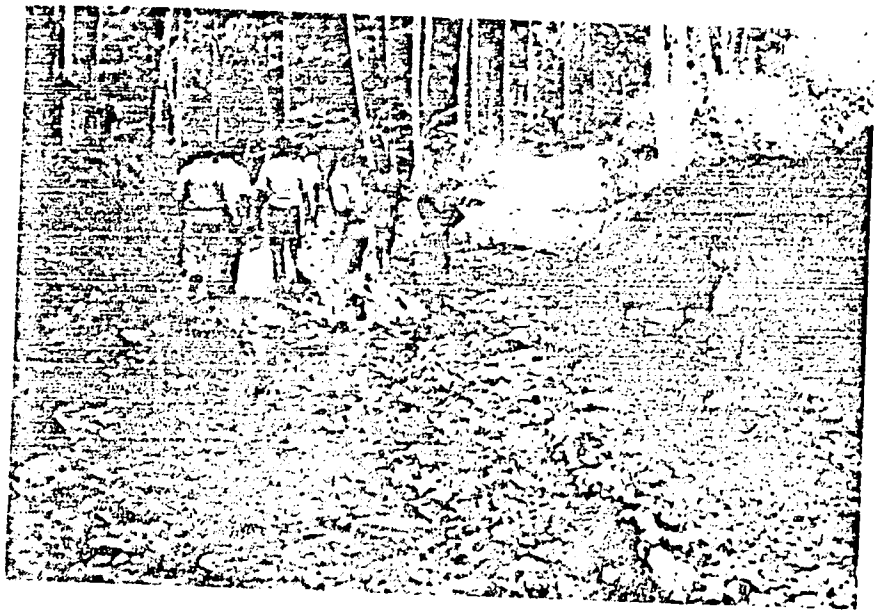
Another mention of spread effects, but in this case largely a potential one, is the group work method of the AES, previously described. Rather than correcting the deficiency in the program first, a World Bank, IBRD, program in the project calls for the building and equipping of Rural Extension Centers. It is difficult to see how those costly brick and mortar projects, and transportation vehicles, will help alter the situation. In making this statement the Consultant is not unaware of provisions in the same loan for the upgrading of extension personnel but all talk encountered on the loan's possible effects concerned itself with material gains.

That buildings are not needed was demonstrated over and over again by villages where the AES agent, the PPL, working jointly with the Desa's farm officer, the PTD, had brought



Farmer Built Mountain Road

Discarded Material Along Publicly Built Road



No Other Way to Reach Some Villages, but to Hike

into effective action group programs. Because the Pamong Tani Desa has no technical training at all and is only a local elementary product as are the petani (literally, peasant) whom he advises, one of the major responsibilities of the Penyulu Pertanian Lapangan, who is a graduate of an Agricultural Secondary School -- a man most frequently but quite often a woman -- is that of on-the-job training. This works efficiently when put into effect because the joint effort means that at least one of the team, and often both, is of the same level as are the farmers.

In Desas, when the officers (either of them) viewed their jobs as that of dispensing information to those who called for it at their respective offices, there was little measureable extension output. These office agents were also those in whose communities there were neither farmers' nor farm women's clubs. It was not brick and mortar, any more than it was a motorized vehicle, that accounted for the difference in the effectiveness of agricultural extension work in the villages as they have been herein described.

The Project Coordinating Committee of the GOI, through which AID administers its loan, is a committee of engineers. Not only is social science under-represented, it is apparently ignored in the committee's organization. AES, which the Consultant considers crucial to the success of the project, participates largely in an indirect manner in the Committee's deliberations. Until that is corrected, the unbridgeable gap between the emprical extension worker and the other so-called technical or professional departments in the same Ministry of Agriculture will continue.

Caught in this uncharged sea of bureaucracy and inter as well as intra ministerial lack of integration, the poor farmer, for whom the project is supposedly being designed, has but a weak voice in the Committee's deliberations. Neither the PTD nor the PPL, who are the peasant's only voice, can be effective spokesmen for their clients when professionals do not deem to communicate with them.

C. Social-Among Other Groups

What movement of people into or within the project area is likely to result from the project?

Larger production ratios or crop intensities should result from effective flood control and technical irrigation, but since almost all of the suitable land has long been under cultivation, or attempted cultivation, better farming conditions should not appreciably increase the number of farmers. Because there is now massive underemployment in agriculture, improved efficiency in the enterprise has much labor slack on which to draw. It is logical to presume that, in the long run, the farm labor force, of both men and women, will decrease. Since the introduction of small threshing and grinding machines from Japan that started in the late 1960's and early 1970's, and reached the great majority of farmers by 1975, the year of the survey, nothing but a continued decrease in labor for threshing and grinding will occur. The survey found farmers had adopted machine threshing and grinding and percentages ranged from lows of 71, 73, and 75 in Sengkong, Langensari, and Padaringang, respectively to highs of 91, 92 and 194 in Bangunharja, Banjar, and Bantarpanjong, respectively, and the other villages ranged in between these values. The universal reasons for having changed from hand pounding or grinding were "faster, cheaper,

less breakage." These trends are occurring in Java, the island with the highest rate of population pressure of all in the Republic, the island that can least afford to have the additional hundreds of thousands of man-days added to its already high rate of unemployment.

Improved roads, primary and secondary, proceed at a steady pace because of more east-west insular travel, and the impetus of ongoing industrialization in the city of Cilacap. These are not a result of the project, but they will have an impact all along the roadways that traverse the project area. These improvements and speeded-up traffic movement will both help and stimulate feeder road building.

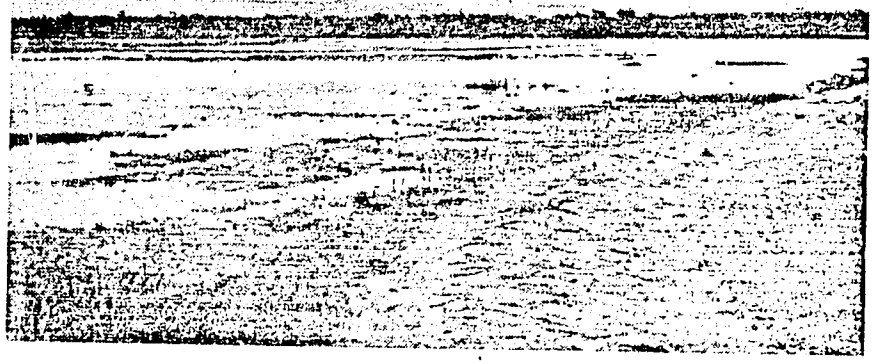
With little land, except the swamp areas, not now in production (a reclamation proposal for the Segara Anakan area, the largest area of swamp land in the project area, is projected for development at a future date), agricultural development will not have the usual impact of drawing new settlers, the largest movement of people may be away from the most rural of the farm villages into the cities, motivated in their search for employment. As this occurs, social infrastructure needs in the cities will rise in education, housing, and health.

What will be the distribution of benefits to the people at different levels of income, both aboslute and relative to their present economic status? Are there social factors which may prevent the realization or distribution of project benefits?

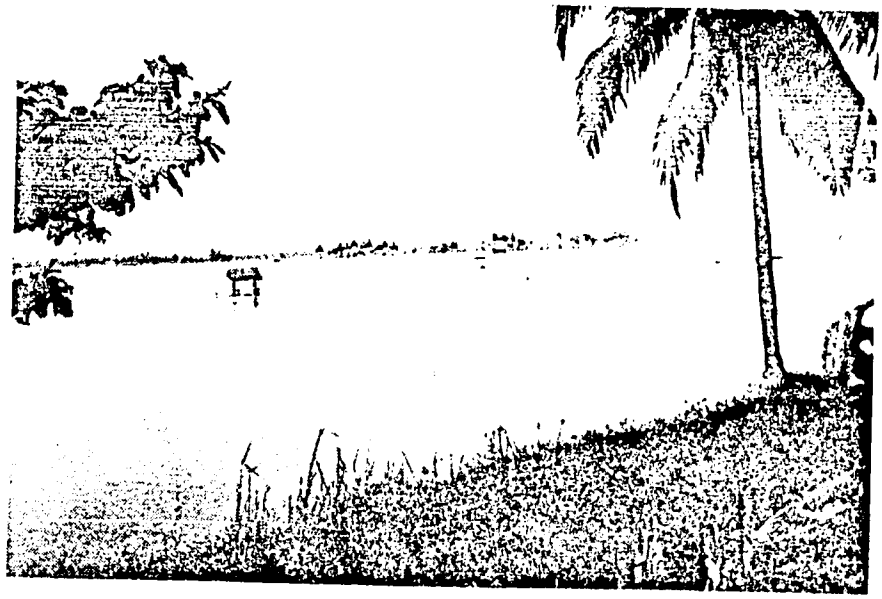
Answers to the questions posed are not within the competence of a sociological inquiry, and in passing it might be observed that even economists, when they tried to address themselves either to the absolute or relative levels of income that could result from the project, could come up with no more than "guesstimates" as they described them in the Master Plan Appendix on Economics by ECI. Farm management research, the report asserts, from which any "before and after" description of the varying income classes could be made, is nonexistent.

With the social team of interviewers varying from community to community, some of its members having no training in field research and some with no more educational preparation than the elementary schooling of the farmer interviewees themselves (see note on Methodology in Organization of Study), questions were designed to get answers to sociocultural determinants of production, not production per se. For example, the innundated fields in Paledah, visibly made it seem apparent that Desa's major problem should be flooding. Tabulation of replies from a little more than half of the 27 farmers interviewed shows that more than half of that number harvested no more than one crop, and even that one reduced in yield because of the incident of insect invasion and diseases both induced by the dry season and the slowness of the flood waters to recede. None of the farmers harvested two full crops; only 44 percent had a combined harvest ratio of as much as 1.5.

Team member competence increased as the study progressed, more precision was possible in distinguishing cropping ratios in the later villages visted. The various Kampongs studied in the Banjar Desa complex yielded a sample where farms averaged 1.13 hectares in size, of which area 31 percent was lost in the dry season because of lack of moisture, and



Paledah and its Flood



Flood Control Badly Needed

39 percent in the wet season from flooding. The comparatively high 39 percent was influenced by the sample interviewees who were Banjar Desa officials and who share-cropped larger than average-sized units in either the North or South Lakbok areas, where lands lie much lower than those in the Banjar plains.

Langensari, although in the same geographic zone as Banjar, yielded a sample of interviewees who farmed in the community itself, had only a 24 percent loss from floods, in contrast to the high Banjar rate, but a higher loss from drought, 33 1/3 percent. Langensari farms averaged only .54 hectares in size, so there it would be small farms that will benefit from flood control and irrigation, whereas, in Banjar, the heaviest beneficiaries, in terms of hectareage, will be the absentee landlords who sharecrop their lands.

Computation of economic benefits, when the needed programs are implemented, can be computed by appropriate professionals, if needed.

Sengkong and Bangunharja, upper valley Desas, illustrate problems in one village, Sengkong, that has not yet effectively benefitted from development change, and another, Bangunharja, that has progressed under its own initiative. In Sengkong, 52 percent of the small farmers (average size of farm for the sample was only .28 hectares) will benefit from irrigation and 48 percent from flood control. The percentages, naturally, are comparatively minimal in Bangunharja, 11 and 8 respectively. To a large extent farmers in the latter village have already corrected their problems.

The two Central Java villages studied, having had their flood problems under control for some years, the result of provincial programs, reported 100 percent harvests in the wet season. But the two villages do need additional irrigation facilities; those now provided by provincial programs are not adequate. Cilo Padang needed a 7 percent addition of irrigation water to assure irrigation water for all its .7 hectare averaged-sized farms, whereas the need in Bantarpanjong was much greater, due in part, to the much larger averaged-sized farm of 1.36 hectares. The portion that was not cropped in the dry season in Bantarpanjong, because of the lack of water, amounted to 38 percent of the total hectareage.

A serendepitous, not planned, distribution of benefits in favor of the very poorest of families will occur when the lowlands are no longer subjected to repeated flooding. Because the poorest of families -- be they the smallest of operators, farm laborers, or share croppers -- can only build the crudest of shelters as homes and these have to be located on the least desirable and least expensive sites. Consequently, in all villages that suffer periodic innundation, these are the first victims but, with flood control, these will automatically become the first beneficiaries. Programs to erase or mitigate loss from flooding appear to be neutral to farm size, whereas installation of irrigation facilities can be manipulated to favor some potential users over others.

In what other ways will economic changes resulting from the project (intended or otherwise) affect labor patterns (e.g., distribution and division of labor by sex and age), economic relations (income distribution, credit, land tenure and share-cropping, etc.), markets and consumer behavior?

The question will have more significance if the inquiry is basically sociological in nature, and will be more meaningful if the economic aspects, including income distribution, are left to appropriate disciplines to answer so the question might read "techno-economic change." In the Consultant's opinion, direction of the economic impact will vary and be dependent on how the project's many technological features are implemented and administered.

Answers have already been given to this modified form of the question in order that the respective phenomena described might have been made more explicit. For example, it has already been said that the substitution of portable gasoline powered machines, which farmers found to be more profitable for hand labor in the pounding or grinding of the grain, has taken away one of the main sources of employment that rural women have enjoyed since the discovery of rice as a food grain. The magnitude of this phenomenon can be appreciated when one recalls that these small machines have been available only since near the close of the last decade. Before that only a small number of farmers had machines as grinding was done by hand pounding -- at home. The machines can both thresh and hull the rice. While there was considerable confusion in both the interviewers' and interviewees' thoughts as they exchanged ideas on the subject, 76 percent of the farmers stated their rice was sent to the mill for grinding. How much of this took place at home with a portable machine was not established.

Another technological change that has already reduced harvest labor need is the substitution of a sickle for the ani-ani (a small knife held in the palm of one's hand for cutting stalks while they are grasped in the fist of the other). When first introduced, sickle labor -- only men still use the tool -- was confined to hybrids (HYV), while the traditional varieties of rice were reserved for ani-ani cutting by women.

Sickle have now invaded traditional variety fields as well and their use will continue to spread. The area of planting available for sickle cutting can be estimated from the proportion of farmers now planting HYV.

A sickle cutter received a wage of 10 percent of the stalks cut, in 95 percent of the farms reporting the practice. Ani-ani cutters were paid the same percentage of stalks in 78 percent of the instances, and 20 percent received larger percentages of stalks. The quantity cut by the two methods was far greater where the sickle was used, so that women averaged 125-150 Rp. per day for ani-ani cutting, while men averaged 250 and more rupiahs per day.

When broadcasting of seed replaced seedling planting, then three of the chief sources of work for rural women are eliminated -- transplanting, ani-ani harvesting, and hand pounding. The only large hand labor task that will then remain for women is that of weeding.

Since no one appeared to be concerned over the results of this technical revolution, what other source of income will the many hundreds of thousands of rural households have which have traditionally depended upon their women as significant earners? Will it have to be public welfare?

The survey found 65 percent of the farmers hoeing their fields by hand. In one-fourth of these households the labor was performed by family members, one-third by hired hoe hands, and two-fifths jointly by family and hired labor with only the hoe being used. In 18 percent of the farms, buffalos did the ploughing; in a small number of these cases, the owner-operator had his own animals, but the majority left his fields for custom buffalo ploughing. The tractor also has begun to make its appearance - 14 percent of the farmers had their lands prepared by tractors, and as was the case with buffalo ploughing, almost all depended upon custom tractor ploughing.

If and when swamp lands are drained and floods are controlled on the lowlands (where ploughing now has to be restricted to hoeing), more buffalo ploughing will make its appearance. The same land reclamation program will also make more land area accessible to tractor ploughing. Both trends will reduce employment opportunities for rural men whose major work source has been hand hoeing.

Twenty-three percent of interviewees stated they did not use fertilizer in their plantings, and the reasons given were: "poor yield," "flood," and "pests." More adequate irrigation will make more abundant use of fertilizers, and when the flood hazard is removed, fertilizer use should become universal. The attempt to evaluate amounts of fertilizer applied was not as precise as intended. There was too much difference in units of land measurement, regional dialects, memories were not reliable enough, and the half hour allotted to field work time for each interview was too short to allow necessary calculations to convert verbal replies into precise statistics. From the information that was obtained -- with one group accounted for in terms of kgs./bata and the other kgs./hectare -- when the first was translated into hectares it yielded an application rate of 193.3 kgs./hectare. The other averaged 151.7 kgs./hectare.

Looking ahead, technological change should result in increases in fertilizer applications so that greatly increased demands in all the various formulas will need to be anticipated.

Traditional seeds have been largely replaced by high yielding varieties of hybrids (HYV); 84 percent planted only HYV, 13.7 percent only local traditional, and 3.9 percent planted both varieties. It was interesting to see that only the very "large" farmers planted both varieties. They could afford the luxury of catering to their families' preference for local rice diets, small farmers could not afford this luxury. Economic necessity had long compelled most of them (over four-fifths) to plant nothing but the highest yielding varieties. The question of whether they purchased traditional rice for their home use was not asked.

Adoption of HYV is evidence that farmers are willing, at all income levels, to change if such adoption of innovations come within their ability to pay for the change. That is a principle that should govern educational programs in all demonstration efforts.

With 52 percent of respondents having only rain-fed paddy operations, and an additional 10 percent depending chiefly upon rain-fed paddy with some supplementary irrigation, the magnitude of changes in land management that could result from the project is apparent. A total of 26 percent were classified "technical irrigation," another 10 percent had operations that might have been qualified "semi-technical," while a final 3 percent had combinations of the two systems. There were 39 percent having some form of

irrigation. With every hectare of land that moves up the scale in management classification to full technical irrigation, there will be a demand for increased inputs of labor, water, fertilizers, insecticides, pesticides, transportation, storage, and technical guidance. Their quantities and financial and economic values are for farm management and agricultural economic professionals to determine. To utilize an amount of 2,500 man-years of on-farm employment in the calculation of economic benefits as is being done, that will accrue from irrigation investments, and not take into consideration any of the labor losses that will result from advancing technology, as described above, is not sound. Upgrading of skills of the labor force will need to be provided for so they will be productive in the technologically-changed enterprises.

Thirty percent of respondents were not participating in either BIMAS or INMAS, but of those participating a much larger percentage belonged to INMAS. The reason most frequently given for non-participation was, "repayment of credit was too risky."

The uncertainty of rainfall -- too little or too much -- will be corrected by irrigation and drainage facilities of the project, and then there will be a significant increase in the demand for credit.

Too little insight into the institution of share cropping was obtained in this study, in view of the magnitude of the practice as was subsequently identified. The reading of background materials and study of published statistics yielded only vague references to the nature and extent of share cropping in the project area. It was identified as a significant factor in tenure arrangements only after the first phase of field work was started, when Kecamatan Lakbok officials, in an attempt to clarify the nature of some of their problems stemming from absentee owners, made known that more than half of the rice lands in their bailiwick were in the hands of "foreigners" (farm exploiters not residing in the community).

From data given by the landlords and the few croppers who were interviewed, it is clear that only verbal agreements cover relations between the two parties. Necessary modifications in the terms of these agreements are renewed each new farm season. Types of changes depended upon which side was more firmly in control.

Contrary to the assertion in the Citanduy Basin Development Project Paper concerning distribution of benefits, this survey did not find that "the owner provides all seeds and fertilizer, etc." When landlords were interviewed and the subject of inputs came up, some stated that all items except labor were their responsibility every crop season, but these arrangements were few. Others claimed this all but the land tax was shared 50/50 with croppers, while inability to answer the question was claimed in still others because these were provided by the cropper. Some even specified that seed was the responsibility of the cropper. Consanguinity and personal friendship played a large part in determining provision of inputs, causing great variation in the final amounts of harvests that might eventually have been distributed under the 50/50 share system.

Landlords, political and military officials and merchants are the "farmers" who have had and will apparently continue to have a voice in the planning and implementation of projects. (See Section D.) With improvement in the production capacities of their holdings, coupled

with the large and ever-increasing amount of displaced farm laborers through technological change, and especially the controlling or elimination of flood and drought hazards, all these can be expected to make landlords more demanding in the social and economic terms which they will impose in tenancy agreements, at the expense of the cropper. Only legislation, now nonexistent, that would clearly spell out the cropper's fair share in the system can avoid worsening of landlord-cropper relations.

D. General Conclusions

AID Circular A-241 in which the guidelines for social evaluation studies of project proposals are established specifies the following basic principle: "A central substantive concept of AID policy is the need to assure the wide and significant participation of the poor in the development process. In this sense, "participation" means not only sharing the economic benefits and contributions of resources but also involvement in the processes of problem identification and solution, sub-project selection and design, implementation and evaluation."

In a study concerned with farm population the rung of the tenure ladder and farm size interval that respective members of the population occupy are two useful and indirect measures of who might be the "poor," in the absence of specific income data from appropriate farm management studies. Enroute to the project area, the team called upon the Director General of Agriculture for Kabupaten Ciamis, (the district where the great majority of the project's irrigation and flood control schemes are located), to solicit his collaboration for the study and to request statistical information on the two factors mentioned. Collection of agricultural statistics rested with the Director General's office. When these were received in a communication after the first phase of the study had been completed, they indicated that the district had a total of 154,300 farms, 96,700 (62.7 percent) of which were under 0.25 hectares in size, and still another interval contained 31,600 units (20.5 percent of the total) of small size, i.e., averaging .25 -- 0.49 hectares each. The communication also reported that 154,300 were farm owners, in addition to which the district also had 201,200 share croppers, but it contained no information concerning size of units in this last category of tenancy.

Village officials were contacted one or two days preceding the day of the scheduled interviews in their respective villages. They were asked to assemble their village-area farmers in proportions of two-thirds in the "smallest" or under 0.5 hectares of land in rice, with croppers and owner-operators in more or less equal proportions, together with a reasonable number of farm laborers. Unfavorable proportions were the result. Only 44.7 percent of the resulting sample fell into the "small" farmer class, whereas almost twice that percentage (83.2), was subsequently reported in the official Kabupaten communication, thus causing an equally disproportionate 55.3 percent in the "large" farm interval. Only a handful of croppers were assembled for the village interview and only a slightly larger number of farm laborers.

Could it be that village officials have little contact with croppers and laborers?

Because they do form the largest part of the population that depends upon income and employment from farming, much greater numbers of laborers and croppers should have

been interviewed. Such interviewing should have taken place in the evening hours, after their respective day's labors had ended, or on-the-job in the fields where they were at work. This, however, would have required twice the time for field work than that allowed under the limitations of the study.

If the Citanduy Project Paper is taken as the yardstick, it reported Rp. 84,000 per 0.5 hectares gain in net income from two harvests under irrigation as compared to yields obtained without irrigation. It applied these estimates to the two "small" farmer groups as their numbers were given in the Kabupaten communication. With this one arrives at an average of Rp. 50,400 per farm with one-half of the 96,000 and all of the 32,000 entering into the calculations. In contrast, if those having 1.0 or more hectares of land are allowed to benefit at the same rate of Rp. 84,000 per 0.5 hectares of land, the 7,000 largest farms involved would benefit by about Rp. 450,000 each. If economies of scale were allowed for, net increases on the larger farms would be even higher. Notwithstanding all the unverifiable assumptions in these foregoing calculations, they do seem to belie the economic analysis that minimized benefits from irrigation accruing on behalf of the large farms.

Perhaps the Project Paper intended that, relatively, because there are two crops rather than only one to harvest, the laborer has a 100 percent increase in his earnings. The owner, absentee or not, does not have this large a relative increase, but his absolute net increase in financial benefits is far greater. This overly lengthy answer to the proposition that the "poor participate in the sharing of economic benefits" is in the affirmative, but it had to be somewhat specific to make clear the fact that, "in the development process" in the Citanduy Basin, great changes in the quality and in the numbers -- in the latter case, they will be downward and significantly so -- of workers bringing major problems that will have to be planned for by all parties in the development project.

The Consultant's studies do not show that the "poor" participate in the processes of problem identification and solution," in contrast to their participation (very much a serendipity result, not planned either for their benefit by themselves or by the planners) in financial rewards.

Leaving the financial argument, further insight into farmer participation on the Citanduy Project can be obtained through evaluation of some of his social behavioral patterns.

It has already been reported that 79 farmer respondents claimed membership in Farmers' Clubs, or 33 percent of the total interviewed. Among the 79 farmers that took out membership 56 percent had enterprises of 2.0 hectares and larger; 50 percent of the next group of large farmers were those farming 1.0 to 1.9 hectares of sawah; 33 percent of those whose farms fell in the 0.5 to 0.9 size interval, and so on progressively downward -- 28, 18, and finally only 11 percent of the very smallest, having units of less than 0.125 hectares of sawah.

When questioned about present and prior service as officers in their clubs, 34 answered that they had served or were serving. Fifteen of these were village officials, teachers, or retired Army officers who also farmed a piece of land in their resident village or share-cropped it in some other part of the district. Another 18 were landlord-operators

who reported no official function. One was a cropper, an unusual one because he share-cropped his family's farm of 2.3 hectares. No farm laborer had ever served as an officer, although 4 of the 34 interviewed were members.

When questions were directed toward wives of households, 42 claimed membership in Farm Women's Clubs. When this was analyzed in terms of the household head's tenure class, the same pattern resulted as was the case with the men. That is, 14 were wives of government employee-farmers, 23 were wives of landlord-operators, one the wife of the same share cropper previously described, and four had farm laborer husbands.

Making the assumption that Farmers' Clubs are one social group that might have an "involvement in the processes of problem identification and solution" gives an answer as to who is involved. All three of indirect measures of participation are in agreement that "poor" farmers, poor as measured by farm size or in terms of their low occupancy in the tenure scale, have little to do with Farmers' Clubs, and little voice through their organizations. It must follow, that their involvement is minimal.

An encouraging observation can be made in concluding this nonmonentary evaluation of participation. Two villages contributed heavily in the foregoing analysis -- Bangunharja and Langensari -- they alone accounted for 30 percent of Farmers' Club membership. The interesting fact is that they are both small-farm dominated, the average size of sawah land in Bangunharja is 0.71 and 0.54 in Langensari. (If the one cropper reported on, who operates the largest farm in the village by far, is eliminated from the Bengunharja sample, it would reduce the average size of the remaining 20 members to 0.6 hectares.) All but two of the 21 farmers interviewed in the first sample, and all but four of the 28 in the second, were members -- enthusiastic, dues-paying members. Both communities had Desa officials who gave generously of their time to promote development in their villages; this carried over to their PTD's, and through them the same enthusiastic help of the Kecamatan PPL's was obtained.

In villages where Farmers' Clubs were dominated by dual career public functionary-farmers, the poor did not have access to any other social groups through which they could participate in the planning or decision-making process. With two-thirds of the villages not yet having Farmers' Clubs, and a greater proportion never having experienced the general uplift that a well organized Farm Women's Club could provide, this should challenge the drastic redeployment of AES personnel so that more of them could be put to work at the farm level.

II. INTRODUCTION AND BACKGROUND

A. Purpose and Objectives

Professional objectives of the Consultant's contract are set forth in AID Circular A-241, and can be summed up by one of its main stipulations which requires that all future project proposals that might be submitted by the several country missions to AID/Washington (such as the one being prepared for work in the Citanduy River Basin

for U.S. FY 76) must demonstrate "there will be a significant participation of the "poor" farmers -- not only sharing the economic benefits -- also sharing involvement in the process of problem identification and solution."

The Consultant was expected to achieve the foregoing objectives by means of a social survey designed to evaluate the project's sociocultural feasibility:

How would the proposal be received by the farmers, their organizations and institutions? To what extent would the people and their organizations adopt and use the technical resources of the project development program?

The Citanduy River Basin has been divided into four subproject areas for development; the social soundness survey covers one, an area that has approximately 93,000 hectares of land that varies from flat marsh/swampland to slightly sloping farmland. It is, by and large, a rice growing area; at least that is the crop for which the irrigation systems are being planned, so this survey used rice land as the primary guide in selecting study areas.

B. Organization of Data

A methodological note is inserted here at the beginning to aid in the interpretation and evaluation of the report that follows. Stating it in modern computer terminology, the basic data of this analysis were manually generated and subsequently converted to computer-compatible form, a process that is common in the biological and behavioral sciences. An unusually uncommon and seriously limiting factor was the total failure of the designers of the study to not having made any provision for the manual or data gathering stage. It had been designed as a social evaluation study in which other human observers were needed to interview, observe, and to record opinions and information given by those under evaluation -- small farmers, and village officials and change agents in the agricultural agencies who are responsible for the promotion of development. An ad hoc team of interviewers therefore had to be put together in the field. Not only did its members have no previous experience as interviewers, they also had no theoretic preparation for their tasks which studies in sociology, psychology, or some other behavioral sciences might have provided. Composition of the team also changed from village to village, complicating interviewing. One member, the interpreter, and another observer, both assigned out of Jakarta, were the only permanent ones.

The open-ended questionnaires that were designed by the Consultant in the field to hopefully yield consistent and unambiguous information were edited and corrected insofar as possible upon completion of each day's work because time limitations of one day of work per village did not permit re-interviewing to correct errors or fill in omissions. When these questionnaires were subsequently coded by the Consultant for key punching, some differences in their completeness and quality became noticeable; some of the variables apparently had turned out to have been too sophisticated for the ad hoc interviewers to understand and use correctly. Consequently, frequencies in some of the tables will reflect the resulting incompleteness.

In view of the foregoing, it should be obvious why the computerized product of the study has been restricted to its elementary descriptive level.

Because the purpose of the evaluation was to obtain opinions from farmers concerning project plans and programs to control flooding and to improve and increase irrigation facilities, a purposive sample of villages was designed with the help of engineers on the staff of Engineering Consultants, Inc., then working at the project headquarters in Banjar on the design phase of the project's programs. The villages chosen represented some in which the staff engineers had encountered existing irrigation installations they classified as "technical," i.e., whose structure and design permitted effective distribution of water throughout the year. In other villages the engineers, classified the irrigation installations as "semi-technical. The great majority of farmers, however, depend upon old-fashioned, rain-fed paddies, subject frequently to deficiencies of water because of low rainfall, or to excesses and innundation during some of the rainy seasons. The resulting survey of farmers, consequently, is not intended to be a representative sample of the project area, but it does contain clues that might be followed through were one interested in a representative sample.

It was assumed that knowledge of, participation in, and desire for improvements in irrigation, drainage, and flood control construction works were functions of farm size and that in turn being a reliable indicator of economic well-being; thus giving the survey "small". and "poor" farmers' opinions and desires as well as those of "large" and "wealthy" ones. It was thus assumed that the best measure of probable response of the different economic level of farmers to project innovations was their previous behaviour. This technique of attitude evaluation was believed better than to submit the farmers to a verbalization of their hypothetical opinions, an interviewing technique that would have been beyond the capacity of amateur team members to follow.

Notwithstanding the comment just made, an attempt was made in the final questions of the interviews to obtain attitudes to announcements of plans and policies for the project as they had been heard expressed in public meetings. This did not yield the desired results; whether interviewers were unable to probe sufficiently, or whether there was a reluctance on the part of the respondents, cannot be said. Two facts, however, do stand out, both of which have an important bearing on the principal objective of this study. One, in many instances when farmers hesitated in their answers they finally did volunteer a statement, "I attend meetings to listen." The Consultant based his opinion on observations made during his attendance at all farmer interview sessions in every one of the villages, and discussions with officials who could converse in English and with those in the smallest villages through the help of an interpreter. Public meetings called on the Citanduy/Ciseel Basin Project were of an informative nature, and were not convened to solicit opinions and suggestions. The attitude throughout is that only engineers know how and what to do on projects, for whose implementation they need the support of public officials. Opinions of "small" and "poor" farmers do no enter into the matter.

Two, the foregoing expression of opinion is supported by the sample group of farmers who did respond to the questions concerning their opinions on expressions of policy they heard at public meetings. These tended to be those classified "farmer-public employees," i.e., their's was a dual role, one was to serve in some capacity as a village official, and

the other was to farm. The latter might have been practiced in their resident village or some other part of the project area through the system of share-cropping.

The survey took place in two provinces of Indonesia, West and Central Java, and two Kabupatens or Districts, one in each of the provinces -- Ciamis in the first, and Cilacap in the second. In the first phase of field work, 8 November-15 December, three Kecamatans, or Subdistricts, of Kabupaten Ciamis were suggested by the engineering staff as probably yielding typical situations of the need for flood control and for improved irrigation infrastructure; the Kecamatans were Cisaga, Labkok, and Padaherang. Consequently, in conversations with the political officers in those Kecamatans, Camats as the officials are called, four Desa units or clusters of some eight to ten villages each were selected where the farm interviews would be held. These were: Desas Puhurwaja, Padaringan, Padaherang, and Paledah. Within each Desa unit, the chief political officer, Kuwu, would recommend two, three, or four Kampongs, a unit whose most likely translation would be "hamlet" if some did not have populations as large as one thousand. Kampong chiefs are called Lurahs.

While it might appear that the above mentioned five-week period should have given time for intensive village study, the study could not be conducted without spending as much or more time satisfying the requirements of protocol at every political level of operation, and these were numberous as has been indicated. In the villages or Kampongs selected for study, contacts had to be made a day or two preceding the date set for farmer interviews, with Kecamatan or Desa officers, and usually both, to help. The purpose of the proposed farmer interviews was then explained to the Kampong headman, and because only one day was allowed per village for interviewing he was requested to gather farmers in his office for the questioning period.

Influenced by background materials that he had studied and which gave some description of farm populations and farming enterprises in the region, the Consultant requested headmen to try to convene 25 or 30 village farmers, two-thirds of them to be small farmers, that is, those having under 0.5 hectares of sawah land, thus leaving the other one-third to be representative of the larger enterprises. Knowing the typical farm enterprise rested on varied quantities of hired labor and share cropping, but having no statistical data on which to judge their respective magnitudes in the project area, it was believe that if an attempt were made to have about one-third of the "small" operators be those who obtained a portion of their annual earnings working as laborers on larger neighboring farms and that about half of the larger farmers be those who farmed on shares, somewhat representative samples would result. The result from this method, made necessary because of the limitations of time, of sample selecting did not provide randomness. In aggregate terms, the interviewees in the two periods of field work turned out to be heavily represented by large entrepreneurs. The "small" farms in the sample totalled 44.5 percent and the "large" ones the remaining 55.5 percent.

Statistics in agriculture are the responsibility of the AES, therefore, a stop-over had been made in the Kabupaten capital city enroute to the study area to inform the Director General of AES about the survey, solicit the cooperation of his staff, and to request statistical details. When the latter were received, after completion of field work in phase one, they gave the first reliable picture of numbers of farmers, by size of enterprise, in

Farmers during Interview.

the Kabupaten, within which political unit the great majority of the Citanduy/Ciseel Project lies. These Kabupaten data indicate that the Consultant's first instructions to village headmen concerning the sample distribution of enterprises, by size, was not far off the target. According to the Kabupaten data, "small" farmers should, however, have been even more generously represented than the two-thirds requested.

Field work for phase two was done during the period 5 to 22 December, and because terms of the Consultant's work agreement had been changed in the interim to allow some of the farmers who lived in the Upper Citanduy/Ciseel Basin Project Area, but in the Province of Central Java, to be included in the study, valuable field work time was lost in the protocol process to make those farm visits in that province possible. Stopping again at Kabupaten Ciamis headquarters enroute to the project area, the Consultant met the AES engineer in charge of irrigation. The Engineer suggested the study in West Java be expanded to include visits to two additional Desa units of Cisaga (Cisaga I and Bangunharja), so as to obtain a representative sampling of mountain village attempts at farming. He also suggested two Desa units in Kecamatan Banjar, one of which was Langensari and the other was a series of three Kampongs in Desa unit Banjar. When protocol in the new province selected had been satisfied, one Desa unit was chosen for study in each of its two Kecamatans, Cimanggu and Majenong; the Desas being respectively, Bantarpangjong and Cilopandang with their several Kampongs each.

The questionnaire of the survey was modified slightly for the second phase, principally to try to gather more information on members of Water User Associations, Farm Laborers, and the share cropper enterprise. Failure to find much response to survey questions concerning Water User Associations in the first phase, and the statistics which had been received from the Kabupaten Ciamis which had more share cropper than farm owner-operator enterprises, made it advisable to try to penetrate more deeply into these two questions. Notwithstanding, data analyses indicate the inability of the survey to obtain enough representativeness of each of the crucial variables -- farm size and farm tenure -- and the survey is left incomplete to that extent.

With interviews carried on in the village bale (public meeting hall) where farmers had been gathered to await the team's arrival, and with neighbor listening and often helping neighbor when questions appeared difficult to comprehend, succeeding respondents obtained a useful introduction into the purposes of the visits. Answers to many of the questions appeared obvious to them, and they could not understand the questioning. Rapport was facilitated by this sort of group interview procedure, so that by the time the third or fourth farmer interview arrived it seemed team members were already discussing mutual problems of farming with long-time acquaintances. Questions could then be more precise and they could be responded to more easily and quickly. Interviewing in the open, as it were, had the advantage also of allaying any fears that there might have been ulterior motives in the probing. The cordiality with which the interviewing always ended and the warmness in the leave-taking would indicate that farmers were grateful that someone had taken the trouble to interview them, albeit through a questioning procedure that must still appear strange to them and to solicit their opinions in matters of village development.[1]

---

[1] The strangness in the procedure was heightened by the fact that it is not customary in developing cultures for the professional to be cast in the role of the questioner, his is that commanding.

This note on methodology will be left with a recommendation. Should similar studies be suggested again for the Citanduy Basin, or other areas of the country, it is hoped the responsible requesting parties will be better informed concerning the needed social content of the proposal, and the required backstopping for the one chosen to fulfill that request. Interviewing is both a science and an art; survey organization and administration take some skill, and when, as in this case, farmers who had never had reason to believe one moment of their time would ever be used in answering such strange questions as they were asked, and had never been introduced to the task of record keeping in their enterprises, the magnitude of this form of a "social soundness survey" should be apparent. Neither manpower nor the time such a task required were adequate.

III. HUMAN AND SOCIAL RESOURCES OF BASIN FARMERS

A. Family Composition

In the Basin, as is generally true of farm societies everywhere, age of household heads is an item that helps give meaning to factors, among these could be tenure status, size of farm enterprise, and education.

Small farmers, as shown in Table 1, who supplement their annual earnings by hiring themselves out for work on larger farms during peak labor demand seasons, averaged 34.3 years of age. Full-time owner-operators were older on the average, and while some younger ones are found in this tenure group, they are not many, because it does take time to achieve full ownership status. The special tenure class, that has been designated "public employee-farm operator" had an average age of 41.6. Merchants who operated land, whether or not they also held public office, were placed in this category because so many "merchants" turned out to be in reality village officials, when the interviewer was more penetrating in his questioning. Landlords, who mainly depended on croppers, and only one of whom cash rented his land, were the oldest of all, as one would have expected; this then means that the average age was 54.8.

The average age of all farmers was approximately 49, and this varied among the villages studied. For example, in Desa Banjar, in the Kecamatan of the same name, only three respondents were under 50 years of age, 48, 40, and 38 respectively. Removing them from the group resulted in the average age climbing to 66. Several factors accounted for the advanced age of these farmers, among which should be mentioned the influence of the headmen in the Kampongs convoking only their closest acquaintances and fellow village officials, to the exclusion of farm laborers. Among the officials were retirees from the government and municipal departments found in that key cross-roads small city.

Table 2 data suggest that size of enterprise in the interval .5 to .9 hectares is the breaking point between older and younger farmers; below that they are younger, while above, they are older. It would indicate that larger sized enterprises are acquired with advancing age. This observation appears to be supported by the age interval 25-49 in which appears the most normal distribution, in terms of farm size, of all age intervals. That interval has small farmers and large farmers, with a tendency to pile up at the .5 hectare size.

The most viable of the several villages studied was Desa Bangunharja, viable is used in its original medical sense -- a term that refers to vital statistics. The average age of household heads was 41.5 years, and a study of each record obtained would indicate that Bangunharja had led all other communities in holding fast to its young farmers. Villages in the lower lands of the Citanduy plains have had large proportions of their potential farmers abandon them in search of other opportunities, having found it not worth the struggle to overcome the vicisitudes of drought and flood. This results in the older age categories owning farms.

B. Education

Farmers that were interviewed were placed in three educational categories. Those who had never attended school or had discontinued after the second grade were classified illiterate, they made up 16 percent of the total. The largest group, by far, were those who had attended school through the elementary system, and made up 69 percent of the total. Those who had gone further than the elementary system and had secondary or high school educations accounted for 15 percent of all household heads.

As was the case with age, whether or not one has received the benefit of an education had to be considered with several controlling factors in mind. The one that comes to the fore immediately is that of economic status, but there are others. One of them is the simple factor of time. Time is functionally related to education, as illustrated by the relationship between age and level of education (shown in Table 3). With many farm villages in the last generation having had no school at all or having been able to incorporate only the lowest elementary grades in their first schools, the illiteracy increases as household heads grow older. With social change occurring so rapidly, and so high a proportion of all villages now supporting at least an elementary school, it is therefore not strange to see no household heads in the youngest age interval, ages 20-34, showing up as having been illiterate.

Having made the preceding assertion, this does not gainsay the factor of parental influence on their children's education. This influence is verifiable through several items in the study, i.e., whether or not older children remaining in the parental homes continue their schooling. Data in Table 4 indicate parental education is a factor -- more of the better educated household heads tend to have more older children remain home to continue studying. Only 12.5 percent of illiterate heads of household had older children living at home and in school. In families headed by elementary school graduates or those who had a secondary or high school education, the percentage rose to 40, and then to 63.7 respectively.

Likewise, older children who have left school and are employed show interesting patterns of following in the footsteps of their fathers in the choice of an occupation. Those who chose the same occupation of farming appear to come from the more illiterate households, as indicated in Table 5.

Few older children had separated from families where heads had a secondary or high school education because so many of them were still tied to the home but were away in other cities pursuing higher educations. Of the 5 who had terminated their schooling

and had chosen to work, all had taken non-farming occupations. This contrasted to the 16 older children in families with illiterate heads who had chosen to farm, while only the remaining 4 of the 20 had chosen another profession.

In the families with an elementary school educated head (and two-thirds of all families fell into this classification), 45 percent of the separated older children had chosen farming, and 55 percent other vocations.

No sooner is a generalization made, such as the preceding one, than it needs modification. That analysis of the most "viable" village -- where one-fourth of the household heads reported their adult children had chosen to continue in the same vocation as their parents, one of the highest percentages was found in Bangunharja. This may suggest that while lack of education in parents is a strong factor in the non-education of their children and thus not being able to prepare them education-wise for an alternate vocation, the economic well-being of a farmer is a decisive factor as well. When parents such as these had exhibited an ability to achieve a most satisfying standard of living from farming, why should not the children follow suit?

There is a relationship between tenure class in basin farming and education, as the data in Table 6 show, but, degree of illiteracy is not the measure. This was suggested in the earlier data when education and age were studied, and with farm laborers who are usually placed at the bottom of any scale of tenure in economic matters and indicating that they are the most disadvantaged group, one might associate illiteracy with them. Since, however, they are significantly younger than any other group, except the public employee-farmer class, and education had become pretty much of a universal attainment during the present generation, there is no reason for illiteracy among this most disadvantaged socioeconomic group. One has to look to higher levels of education, and in this study that includes technical and high school education, and only one of the laborers and none of the croppers had stayed in school beyond the elementary grades. The highest incidence of high school education was naturally found in the public employee-farmer group, with a third of their members having that degree of education, followed by both landlords and owner-operators with each having about one-tenth of their numbers in that situation.

Only two of the household heads interviewed in the ten Desas, with an average of 23 interviewees per Desa, were women. Undoubtedly death, divorce, and desertion have resulted in female household heads; but only two village headmen thought women should also be interviewed in matters of farm welfare, one woman coming from each of the two villages.

Asking the male household heads questions concerning the education of their spouses, wives turned out to be a little less fortunate in educational terms. A somewhat higher fraction fell into the illiterate interval, 24 percent, with lower percentages of wives compared to husbands in the other two intervals -- 64 percent having an elementary school education and 8 percent secondary or high school.

In addition to the two female household heads, several wives accompanied their husbands to the meetings, and the two who attended in Langensari, and two in Paledah, were of

great help not only in the interviewing of some of their neighbor farmers, but in the help given their husbands. For some reason the questions appeared strange to the interviewees in Langensari and the Kuwa's wife clarified these questions in many of the cases.

Among the questions asked of farmers one of the last was inserted to ascertain if their wives attended meetings of the Water User Associations, Farmers' Clubs and similar groups. The affirmative replies were all too negligible to tabulate. It is the rare woman in a Moslem society who puts in an appearance at public meetings, and it is even more unusual to have one participate in male discussions.

In an attempt to measure current educational practices in farm families, a series of questions concerned children in the age bracket 6 to 14 in the households. Forty percent had no children in this age group and 60 percent did. The average age of the youngest one at home was 8.9 years. Among these, 75 percent were attending school, while 25 percent were not. The highest grade attained by the only child at home was calculated at 2.9. There appeared to be no significant problems of non-attendance or of retardation.

Carrying this one step farther to the second child at home, 89 households had two or more living with them at the time of the interviews. Their ages ranged from 7 to 14, with an average age of 11.2 years. Of these, 92 percent were in school and had reached an average of 4.2 grades. Again, these indicated no abnormalities.

Thirty-one of the families had three or more children of school age at home, 8 had four such children, and there were none who had five or more. In the first group, 82 percent were in school and in the second, 100 percent were in attendance.

Further insight into parental factors in educational matters can be seen from the fact that 12.5 percent of illiterate-headed households had older children at home and attending some type of school. This percentage rose to 40 among those families where the head had an elementary school education, and to its highest level, 63.7 percent, in families where the head had a secondary or high school education.

In passing, "no elementary school in the Kampong" was cited by many farmers as being among their village's most serious problems in need of correction. However, lack of a health or clinic facility was mentioned more frequently than was a school, possibly because there were fewer villages lacking schools than those having a health facility.

School building, accomplished through voluntary contributions of villagers' labor and finances, with the GOI contributing the teachers, was the most frequently mentioned self-accomplishment of villagers. Villagers have great respect for education, and while the majority of them (almost two-thirds) had no more than an elementary education, that did not lower their estimation of its value. Some of the Desa Kampongs are too poor to even support an elementary school of four grades.

These facts, as above described, may surprise those who bemoan rural educational "disadvantages," because at the elementary school level, at least, rural Javanese have moved well forward.

In summary, since the Consultant has encountered widespread misunderstanding and misinterpretation of the phenomenon of education among peasants, with whom all of his foreign service has been concerned, and the role it plays being so incorrectly defined, not only by professionals native to those countries but almost as incorrectly defined by expatriate professionals, he would close this section on education with some of his own evaluations concerning the institution. Unfortunately, a correct understanding of, and agreement on its principles, have hindered development experts, local and foreign alike, from using education to its fullest.

While its full meaning may escape him, the Consultant would affirm his belief in no uncertain terms that a lack of formal education among farmers is not to say they are ignorant. Equating ignorance with a lack of formal schooling is an erroneous conclusion, and strange as it may appear, such error is most widely found among the educated, usually nonfarmer urbanites, who are assigned to work with farm people. This is an attitude that lies at the very heart of the problem of lack of communication between the farmer and the professional.

This has even more significant implications than may at first appear. It is no longer necessary to spend so much effort and money to tell farmers about the advantages of using superior rice seed varieties, the increased yield that will come from the proper application of fertilizers, or the positive effect of insecticides. This is especailly true when trying to promote innovative technologies with the Indonesian peasant whose only capital resources are those of a piece of land less than .5 hectares in size and an underutilized family labor supply. Demonstration farms that have access to the use of unlimited quantities of inputs may do more harm than good, unless the promoters of induced change in those pilot farms first assure themselves that the hoped-for innovator-acceptors have access to the same seeds, fertilizers, amounts of water, and insecticides as they do themselves, and that these will be available in quantities and at times that need dictates, and at prices (subsidized if necessary) to place them within the reach of the income levels of farmers for whom the demonstrations are intended.

IV. FARM ENTERPRISES IN THE BASIN

A. Numbers and Size

1. Number

The typical farm enterprise which the Citanduy/Ciseel project should be designed to serve is depicted by data that are given in Table 7. This table is for Kabupaten Ciamis, so it does not include basin area farms that form part of the Kabupaten Cilacap, in Central Java. Since more than 90 percent of the agricultural lands are in the part of the two river basins, this evaluative study will cover Ciamis.

The values of the data in Table 7 were never capitalized on, except in part. That is, reviewing the data and the phenomena to which they apply left many unanswered questions because neither the AID interpreter nor representative of the Ministry of Interior, who

had been assigned to observe the project, had any technical knowledge in agriculture, and no training whatever in the disciplines of agricultural economics, rural sociology, or farm management that they should have had to carry the burdens of communication in a technical discussion.

The picture became more beclouded when the same communication from the District Directorate of Agriculture elaborated on the tenurial problem with the following statistics:

Farm owners	(petani pemilik)	154,289
Farm renters) Farm croppers)	(petani penngarap)	201,244

Correct interpretation of what these latter data mean, within the context of American agriculture, has not yet been achieved. How much duplication there is between the two series was not determined, so their true meaning awaits a future researcher who will have the company of counterpart staff with the necessary competence to be able to interpret correctly tenurial similarities and differences within the respective two cultures and languages.

However, the data did serve to establish the broad dimensions of the study. Background readings neither gave the Consultant any appreciation of the extensive phenomenon of share cropping in the region, nor a correct idea of the size of farm enterprises to be studied. When the Kabupaten statistics are used there is a better grasp of the nature of problems, than when operating on the belief that the median size per farm is only .5 hectares, as given in the feasibility reports, describes the entire study.

2. Size

Types of enterprises represented in the sample are given in Table 8. Because the purpose of the study was primarily concerned with rice farmers, all of the sample were such, and all but one laborer interviewed, had lowland rice land, or sawah as it is called. Four-fifths of the sample farmers also had upland, usually larger in size than the areas of lowland, but that portion of the enterprise did not come in for study as did the rice lands. The remaining one-fifth of farmers had only sawah; a little more than half that portion having only one plot, while the remainder had multiple plots of lowland rice. Only one of the 34 farm laborers interviewed did not possess any land whatever; when not employed in farming he and his older son were employed as common laborers in other industries.

How representative these data may be of farming in the project area as a whole was not determined. Undoubtedly the percentage of farmers who operate only uplands is large because much of the upper reaches of the project are covered by plantations where small farmers predominate. Interviewees were selected because they were lowland rice, and not upland crop, farmers.

In terms of farm size, details are given in Table 9. With only 44.5 percent of the sample farmers falling in the interval of less than .5 hectares, this indicates survey findings cannot

be considered fully representative of "small" farms in the basin area, if one accepts the 83 percent under .5 hectares reported for the Kabupaten as being correct. In view of the above, perhaps it needs to be asserted at this point that conclusions concerning the main objective of this evaluation -- i.e., opinions concerning and participation in the project of the poor -- might reasonably be expected to have been more adverse and unfavorable than they were found to be considering the over-representation of "large" farmers in the sample.

B. Irrigation

1. Classification

With irrigation so vital to the growing of rice, some of its technical language has become quite common among farmers. Therefore, relying heavily upon the judgment and help of the DESA PTD or the AES PPL, one or both of whom were present at all interviews, farms were classified into three categories. When they had access to a canal system of year-round flow and its distribution on the farmers' land could be controlled and measured, it was labeled "technical." When they were not provided with measuring devices and had only simple, semi-permanent intake and turn-out gates, they were called "semi-technical." When force of gravity was the only means to direct flows of water, (on and off the paddies) that come with the rainy season, these were called "rainfed."

It is highly probable that the resulting classification would have been different had standards been applied by engineers, but those classified by team interviews gave results shown in Table 10.

Team-farmer definitions gave 51 percent of the total as having rainfed irrigation systems, 25 percent with technical systems, and 10 with semi-technical. The remainder had combinations of the three types of facility.

The Master Plan Appendix F, Irrigation, by ECI, gives the following data on irrigation from a survey conducted on 36,984 hectares under rice cultivation in the Upper Citanduy/Ciseel Sub-Project:

1.	Technical irrigation	3,489 ha	9 percent
2.	Semi-technical	2,021 ha	6 percent
3.	Rural irrigation	22,001 ha	59 percent
4.	Rainfed	9,473 ha	26 percent

Not only do the percentages in the evaluative survey differ greatly from those just given, but the common use of the term "rainfed" system in this study undoubtedly includes much of what the engineers class as rural. There may be further confusion in the data, but they are not intended for comparative use, only to get some judgment of what farmers were thinking when the rainfall by nature is helped to produce crops in both seasons.

2. Some Individual Systems

For example, the case of Desa Bangunharja yielded only one classed as "rainfed" and the other 21 fell into "technical" wholly or in part, yet it is quite possible irrigation engineers would classify this village's system as "simple" or "rural." The Consultant and his colleagues considered Bangunharja as having the most efficient of the irrigation systems they evaluated. They had no doubts when it was labeled "technical" by its builders and efficient users. Bangunharja farmers constructed the weir getting the needed technical guidance from public engineers.

The weir cost Rp. 97,500 and was paid for by an assessment on its 120 members at a rate of Rp. 700 per 100 bata[1] of rice land.

Desa Cilopandang in Majenong, one of the two Kecamatans studied in Kabupaten Cilacep, Central Java, had all but one of its farms classified "technical" and the correctness of the classification is reflected in the small percentage, .06 percent of the sawah dry season planted hectare area failing due to lack of irrigation water, and no losses at all in the wet season. In contrast to Bangunharja, Cilopadang had the provincial department of irrigation build its systems, although farmers paid for some, perhaps all, tertiary canals and structures and the field distribution system.

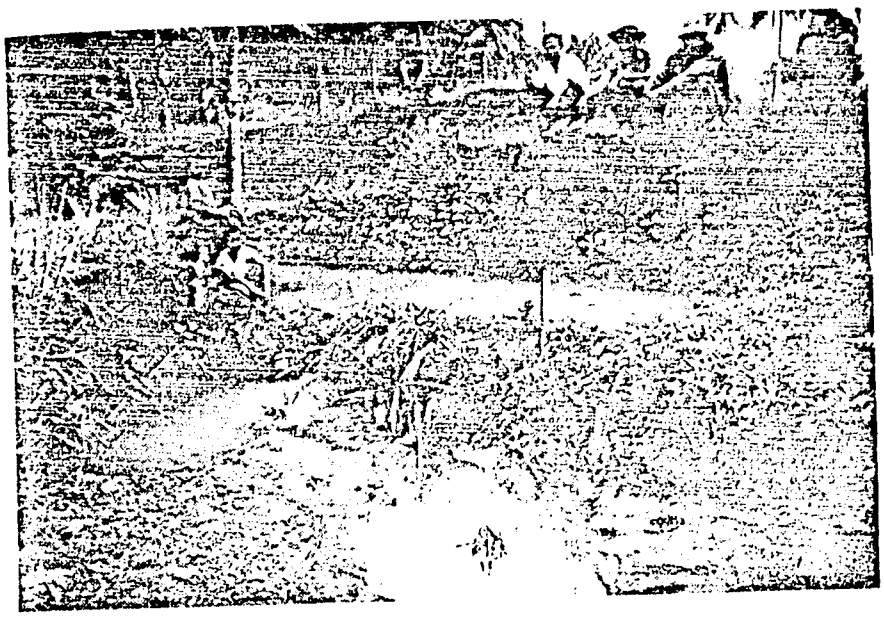
Langensari was another of the Desas, but in West instead of Central Java, where the fundamental system had been built originally by the government but it was never maintained as well as that in Cilopadang. Farms were placed in the technical and rainfed classes in about equal proportions, 38 and 43 percent respectively. This shows up in the one-third loss from drought in the hectareage planted during the dry season.

A confusing result turns up in Cisaga I, Sengkong with 22 of its 28 reported as technical systems, and 4 semi-technical, farmers suffered a reported 52 percent loss of hectareage planted in the dry season. Since they also lost 48 percent from flooding, losses in the two seasons would indicate that the system the villagers of Sengkong had was not more than that classified as "simple" or "rural" by the engineers. This conclusion is supported by the mountainous terrain that had to be climbed in order to reach the village, likewise the haphazard manner in which the "irrigated" plots were found in the many little valleys visited.

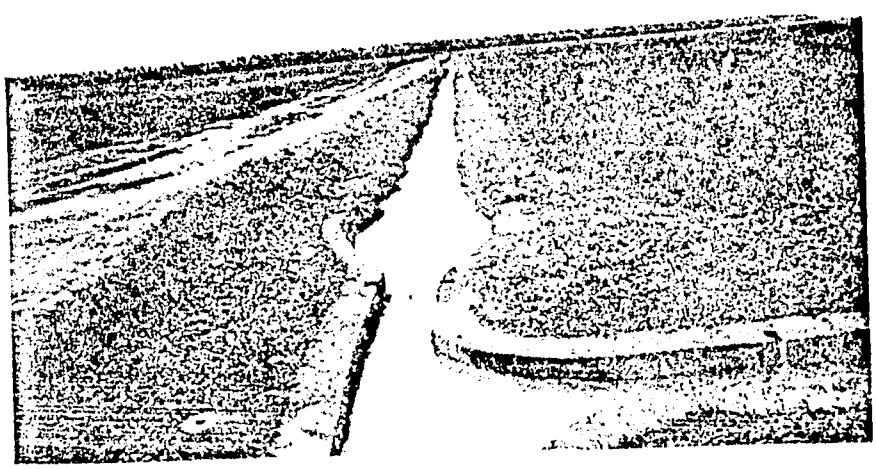
Bantarpanjong of Cimanggu Kecamatan, the second area in Central Java that was chosen for study, had a series of four-inch diesel pumps to supply irrigation, but 72 percent of the farmers visited were located too far from the wells, so they had to depend upon rainfed irrigation. Only the remaining 28 percent had some combination of technical irrigation facility. Well irrigation will not be the solution for the villagers' need of irrigation water is illustrated by the request which the headman made, that the Consultant visit a nearby valley in the Desa that could serve to impound irrigation water if a catchment

---

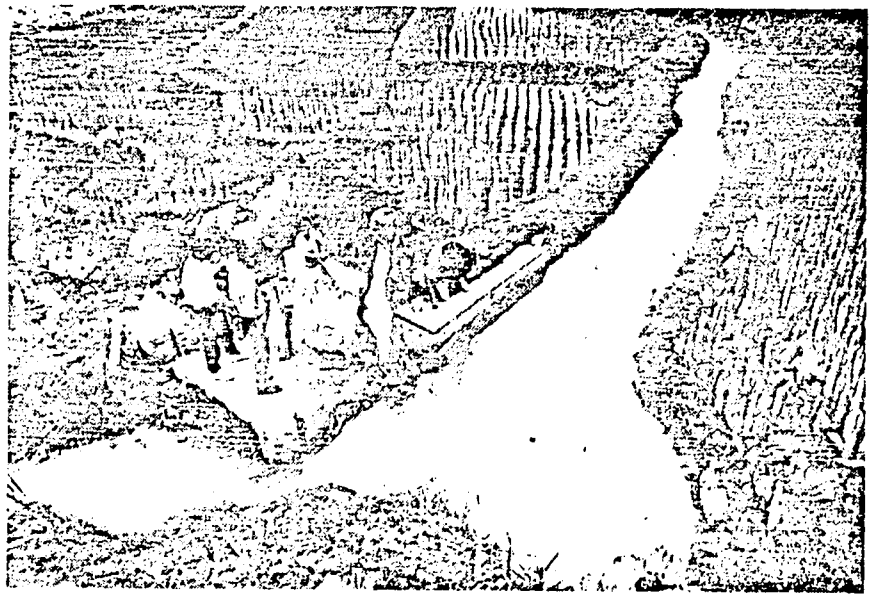
1 Local unit of land measure, 716 bata: 1 hectare. At 416 rupiahs: 1 U.S. dollar, above assessments were S.84/hectare of rice paddy. It might be interesting for Proyec personnel to compare these with costs in publicly constructed similar structures.



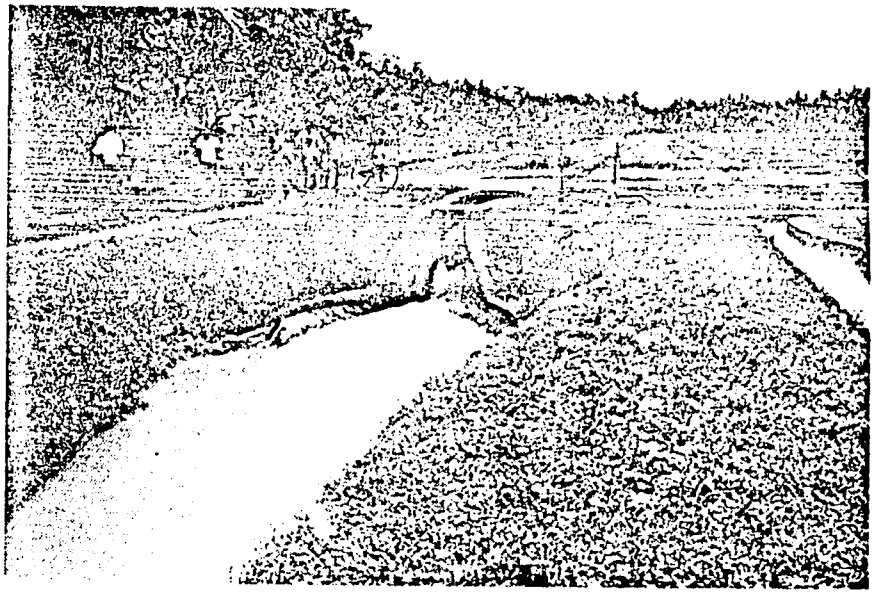
Farmer Built – "Gotang Royong"



Publicly Provided



Bangunharja – Farmer Built



Cilacep – State Built

dam was installed. Shortage of well water caused a 51 percent loss of hectareage planted in the dry season, and when sawahs averaged 1.36 hectares in size, that loss represented a significant amount of lost income.

Puhurwaja in Cisaga Kecamatan was recommended for study by project staff and was found to have 44 percent of its sample farmers with technical irrigation, 19 percent with semi-technical, and only 4 percent rainfed. The remaining 33 percent had differing combinations of the three basic systems. The system dates from early post World War II years and is now included in the number that will be rehabilitated.

In spite of these excellent farming facilities, the Village Water Users' Association, located in this Desa, encountered strong opposition. The complaint being that it was imposed on them and dominated by the farm agent, PTD, or the headman or Lurah. This is the reason for the low percentage of farmers belonging to the association.

C. Production, Productivity, Consumption and Inputs

1. Production

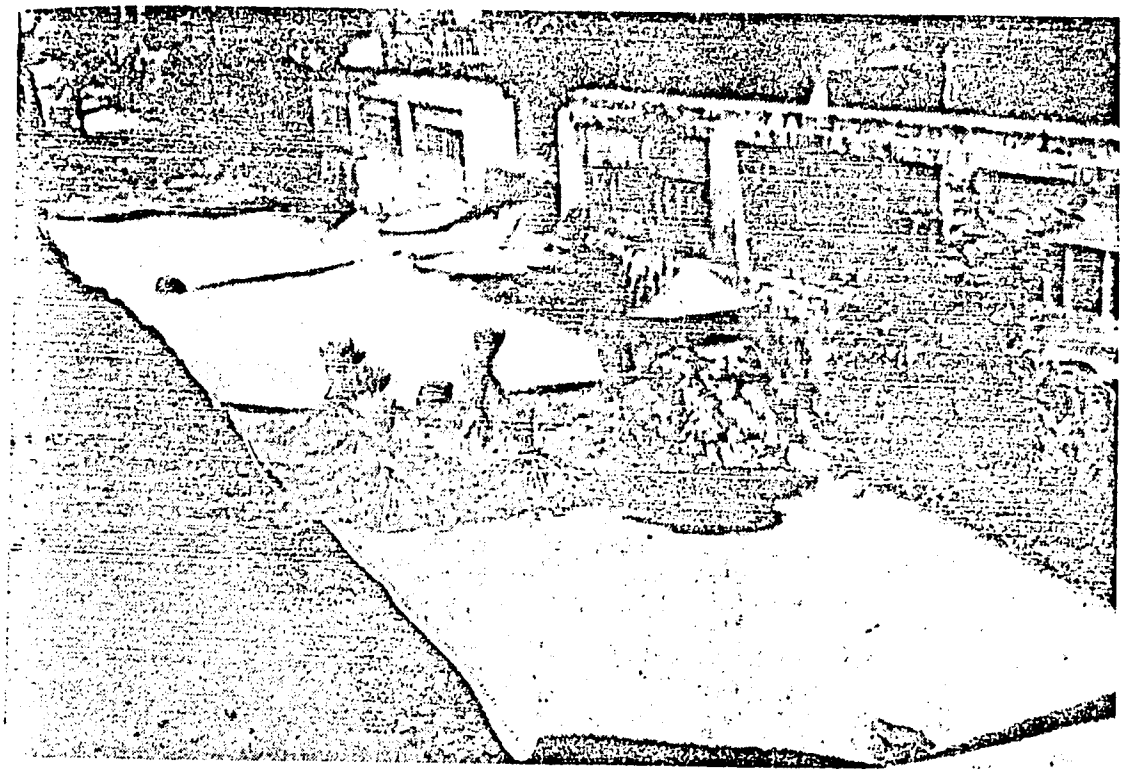
Since this study is not one of farm management, and the data not having been solicited to serve that discipline, only a general description of production and productivity processes and amounts are herein given.

In the subsequent editing of questionnaires after field work had been completed, it became apparent that two differing units of measure had been used. Although instructions had been to note all production in terms of kgs./hectare, only about one-half were found to be filled out as instructed in terms of dry stalk amounts. The others were given in kgs./bata -- some in dry stalk and some in wet stalk. In addition a large number did not specify which of the latter discriminatory factors were used. For these reasons the data for four of the Desas are not used in computing production amounts.

Among the other six Desas the highest production amounts were calculated for Bangunharja, where they were 3,730 and 3,930 kgs./hectare respectively in the dry and wet seasons. In Langansari they were 3,570 and 3,870; in Cimanggu, 2,670 and 2,610; in Najenong, 2,475 and 2,760; and in Banjar, 2,400 and 3,100. The lowest were reported for Sengkong, 1,845 and 1,895 respectively, and when it is recalled that the average size of rice plot in Sengkong only approached a scant .3 hectares in size, it should not be surprising that absolute yields were only 535 and 555 kilograms for the two seasons.

2. Productivity

A harvest ratio generally used in tropical farming by the Consultant of 1 is low, meaning no more than one of potential multiple crops was harvested in equal proportion to area planted. The extent to which farmers had provided for themselves or had benefits from publicly-constructed works to reduce or eliminate danger of flooding through proper drainage systems, or to irrigate, had a direct bearing on production ratios. This was found as expected, but therein also are the problems.



Drying Wet Stalk Rice

Those who succeeded in reaching a ratio of 2, as indicated in Table 11, means they had succeeded in harvesting at the close of each season the same areas in terms of size that had been planted. The table classifies the enterprises into five classes of irrigation, and shows that all entreprenneurs who had achieved a ratio of 2 was only 23.2[1] percent.

The details studied in this table confirms the expected, i.e., ratios of 2 favored those having units technically or semi-technically irrigated, but in unexpected order -- two-thirds of the semi-technical and about one-third of the technical. Only 10.7 percent of the rainfed operations yielded a ratio of 2.

Farm tenure was of mixed influence in determining productivity. For example, in the case of operator farm laborers with one-third of their number having ratios of less than 1, they had the dubious distinction of being the leaders at that low level. They were followed on this score by the employee-operators and croppers, with each having one-fifth of their numbers at this low level of achievement. Some landlords and owner-operators fell into the category, but only about one-tenth of each group.

At the other end of the measure, productivity ratios of 2 reached their highest percentage of 27.1 among the owner-operators. They, in turn, were followed by the employee-operators' 23.9 percent, operator-laborers with 18.2, and finally, by the landlords with their 15.0 percent.

When productivity is considered with respect to size of enterprise, in contrast to tenure, a higher degree of relationship may be observed, as given in Table 12. Fifteen of the 18 "micro units" (those under .125 hectares in size) 83.3 percent had ratios as low as 1 or lower. Incidence of this low level of ratio dropped successively to 48.5 percent in the next interval of size, .125-.24 hectares; to 25.0 percent in the interval .25-.49; and to 9, 7, and 2 percent in the three large-sized intervals respectively.

When the cropping ratio was 1.5 and over, or reached a high of 2 as it did in about one-fourth of the cases, the relationship was again positive to farm size. For example, none of the smallest units of under .125 hectares fell into this cropping ratio. The foregoing level of cropping ratios began to appear with farmers in the next interval, .125-.24 hectares, where it was reported to be 22.9 percent, and then rose to 40.9 percent in the interval .25-.49 hectares. The percentages continued to rise with each interval, reaching to the highest level of 84.6 in the largest farm interval, those with two or more hectares of sawah each.

Neither production nor productivity ratios were found to be as high as those reported by the AES and quoted by the ECI in its Master Plan Appendix, Agriculture. Likewise, a "crop area loss average of about 4 percent for both the wet and dry seasons," appears

---

[1] Having interviewers reporting production quantities by hectare or by bata did not preclude using both in calculations of productivity ratios. However, the few that could not be converted into dry stalk amounts because no discriminatory evidence had been noted, do impair the computed accuracy result. One interviewee was a laborer who had no land, which left 237 valid questionnaires for analysis.

to be a gross underestimate of losses, if the data in this survey are at all representative of the Basin's agriculture. Crop losses from flooding, drought, disease, and pests were found to be large. Questionnaire after questionnaire contained the enumerator's penciled remarks when he calculated production results, "wasted by, in 1974, insecticide, pesticide, and flood." The enumerator's courageous effort in the use of a foreign language did leave some room for grammatical improvement, but his meaning is clear. One who watched the care he used in prodding farmers' memories of the season-before operation factors, cannot but severely question the procedures used by the agency in its selection of sample farms, on which provincial and national publications rest.

3. Consumption

When questioned concerning disposition of their rice production, 60 percent of household heads stated that they had both supplied their home food needs and had some for sale. In contrast, 38 percent reported all was consumed in the home. Only 2 percent reported all their yield was sold. These proportions varied by farm size and tenure class, and because the first is so obviously expected, only the variable tenure warrants closer analysis.

Confirmation that tenure status is a valid indirect indicator of economic status is clearly indicated by the subsistence nature of farming by both croppers and laborers. Two-thirds of the first so classified families consumed all their share received from farm operations, which rose to four-fifths among the farm laborer families. In contrast, only one-sixth of the landlords consumed all their rice shares, and one-fourth of the owner-operators did likewise. Data are given in Table 13.

Among those whose quantity of rice production was not even enough to meet their family consumption requirements, 53 replied to the question how the deficit was resolved. Three-fifths of them resorted to seasonal farm work off their own units, either on the part of the head or spouse, and frequently both. This was how most interviewees who began the questioning session as operators were classified as "operator-farm laborers." One-fourth of the respondents bought their home rice needs with proceeds from the sale of upland crops. One-fifth either had other supplementary employment, as did all the employee-operator group whose units did not supply their consumption needs, or they depended upon relatives to meet consumption deficits.

That two-thirds of the employee-farmer dual occupational group consumed all their production and was principally a function of farm size, as it was with all tenure classes. However, in the "bureaucratic" farm operator class, to have an uneconomic-sized unit or a subsistence unit, was a matter of choice. This was not the case with laborers and the large majority of operators. (Majority not in the study sample, but of the small operators reported in Kabupaten statistics.)

4. Inputs

a. Seed and Fertilizer

In general terms, seed and fertilizer inputs follow similar trends. Use of high yielding varieties of seed, HYV, was found to be practiced on 86.3 percent of the farms, and

commercial fertilizers were applied on 77.2 percent of farms. Distributions of innovators differed within each factor, so whereas the first was obviously related to farm size, the other did not appear to be strong.

If the percentages shown in Table 14 using only HYV are added to those who planted both HYV and traditional seeds, the global result comes to 86.3 percent of all farmers interviewed. The remainder, 13.7 percent, planted only traditional varieties.

As one moves up the scale of farm size, the percentage use of HYV also moves upward, starting from 64.7 percent of HYV innovators in the smallest size interval and reaching 81.5 percent in those having rice producing lands of 2.0 and more hectares each. The highest percentage is seen in the interval 1.0-1.9 hectares, where it reaches 85.2 percent, but it will also be observed that among the biggest farmers 11.1 percent of their numbers planted both HYV and traditional seeds, making a total of 92.6 percent who used HYV on all or part of their fields.

It is interesting to note that a choice of reserving some land for traditional plantings -- because of preferences by taste, family tradition -- does not appear until one reaches the over .5 hectare level, or what is herein termed the "large" farm. Neither of the three smallest interval groups could afford to use their small holdings for both varieties. Liking its taste or not, 78.6 percent of the combined three smallest sized groups planted only HYV. They needed to maximize output on their small holdings and apparently found that an input of HYV was the answer.

In the case of fertilizers, only one farm-size interval differed significantly from the rest, and this occurred in the smallest "micro" unit of under .125 hectares in size. As might be expected, only 16.7 percent of them used commercial fertilizers, while 83.3 percent did not, and with so high a concentration of users of traditional seed varieties in this interval this low percentage of fertilizers might have been foreseen. In all of the other farm size intervals (see Table 14 for their respective sizes), fertilizer users ranged from a low of 77.3 percent and reached its highest point, 88.9 percent, among the largest farmers, those having two or more hectares of sawah. It is for these reasons, after one accepts the "micro" units, the relationship between fertilizer use and farm size was clearly a positive one, but not as critical as in the case of choice in rice seeds.

Regarding amounts of fertilizers applied, the analysis cannot be precise. Units of measure varied greatly in the regions covered by the survey and terms used were unfamiliar to some of the enumerators. Languages also varied and the brief time allotted for each of the interviews could not but leave many questions unanswered or only partly answered. These comments are not intended as criticisms, they are made so that readers of this monograph will be helped in his understanding of what is said. Instructions to record data in kgs./hectare were found subsequently to have been followed by only one-third of the interviewers, whereas about half used kgs./bata. Few of the PTD's or PPL's who collaborated understood English, but since one or both were present at all of the interview periods it was decided they might also benefit from acting as interrogators of their former clients, but under the supervision of one of the permanent team members. Since they could only note answers to questionnaire items in the vernacular (the questionnaire was in both English and the native languages as an aid to all participants), their translation

into English was done long after the survey was finished. Had the editing been done on the spot there would have been fewer incomplete questionnaires to be tallied.

Notwithstanding these obstacles, 72 interviews were obtained where kgs./hectare were used, and the calculated average amount per hectare came out to 151.7 kilograms. The other 116 interviews, when converted to kgs./hectare, give an average of 193.2 kilograms. In neither instance were the data detailed enough to break them down by formulae. Reasonableness of the averages will be left to project professionals to weigh, and while there is little doubt about their not meeting standards of the farm management specialist, which they were not intended to do, they serve the purpose of illustrating problems that are encountered, and that must be overcome, when one is concerned with the task of promoting induced technological change.

They do bespeak, and very clearly, the readiness and willingness of farmers, regardless of differences in sizes of their enterprises, to adopt innovations they have seen to be proven economical within their ability to purchase.

b. Credit

When the question of credit was analyzed, all farmers -- "small," "large," or "largest" -- were found to have been fully responsive to vicissitudes of natural phenomena. If their rice land, whatever its size, was subject to periodic flooding or suffered from delayed water runoff because it was swamp land, or was regularly dry and parched for lack of irrigation facilities that might have corrected the deficiences, the credit needed to buy fertilizer was judged to be a great risk. To run the risk of a lowered harvest brought on by nature usually had some alternatives, including that of tightening one's belt if need be. Non-repayment of loans that might have been received through a credit system to purchase fertilizers, on the other hand, offered no alternatives that a self-respecting farmer could consider. His prudence, intelligence, and integrity told him not to purchase fertilizer on credit but to run the risk of overcoming natural hazards.

For the 234 farmers whose responses were recorded on the question, 69.7 percent answered "Yes" to the question of being then or having recently been in one of the BIMAS or INMAS programs, the former offering special concessions in credit from the government, through the Bank Rakyat Indonesia. INMAS is also a government subsidized plan, except that farmers must furnish their own credit sources or financing. Negative replies were given by 30.3 percent.

When share croppers and operator-laborers are removed from the totals, the percentage of those participating in the two programs rise only by a few points to 76.7. This is because two-thirds of the croppers were participants in one or both of the programs, as were almost half of the laborers. In other words, neither tenure nor farm size were very significant in determining who would or would not be participating. Nature, when it frowned on the farm, was the influential factor when credit was not used.

The Chief of Denas Pertanian in the Kabupaten supplied the following statistics concerning BIMAS growth under the AES:

Year 1974:	73,732
Year 1973:	43,290
Year 1972:	15,400

Taking his statistics for 1974 that reported 154,289 owner-operated farms in the District, and 201,244 sharecropper-renter units, the 1974 membership of 74,000 would yield a participation index of one-fifth of the farms. That the village study sample got as high an indication of membership as it did, over one-half, would suggest that the interviewers were exposed to the better farmers -- better in the sense of being group-oriented farmers. However, since this survey did not distinguish between BIMAS and INMAS participation, it could be that participation in the latter outnumbered that in BIMAS. To the extent this supposition is valid, then the participation rate of the study would have been nearer that reported by the AES.

c. Bio-Chemicals

To conclude this discussion on bio-chemical inputs, it is a proven fact that induced technological change through these inputs will produce larger yields. Unless the professionals who are involved in the implementing stage will so understand that, in addition to stimulating yields, their increased adoption will also destroy nature's own way of keeping under control plant diseases and the insects that spread disease, they court disaster. The long dormant periods that nature provides between seasons is its manner of depriving insects and diseases of the plant foods on which they thrive. The widespread diffusion of genetically uniform superior yielding seed varieties will also make them more subject to unexpected and unpredictable disasters of region-wide proportions. This is a proven fact as all specialty crop growers in the Western World have learned to their sorrow.

Because there is greater warmth available to the tropical soil does not necessarily give the tropics greater natural capital. On the contrary, because there is no break in their constant warmth, organic matters decompose more readily and it is more difficult to maintain a balance in the soil's humus. All these accelerate leaching of soil nutrients rather than allowing their absorption into the root system of hungry plants. A zoologist experienced in tropical ways has expressed these hazards in the following words:

"It (irrigation) eliminates the only part of the physical environment that is on the farmer's side in his competition with animals and weeds. The less extreme the dry season or the more thorough the irrigation, the less extreme are the seasonal dips in insect pest populations with which the farmer can synchronize his crop's growth."[1]

The Consultant found some planning of demonstration plots in the Basin, but nothing in the way of fundamental research. The question of whether the large sum of money

---

[1] Daniel H. Janzen, "Tropical Agroecosystems: These habits are misunderstood by the temperate zones, mismanaged by the tropics," Science, Vol. 182, 21 Dec. 1973.

that will be invested in the Basin's agriculture warrants the creation of a branch experiment station of the nation's agricultural research center in Bogor. This branch would then adapt entomological and genetic research programs so they will conform to the agroecosystem of the Basin. The question as to whether the adverse economic effect of the pathological probabilities described entered into computation of the project's benefit ratios was also raised.

Scientists cannot predict the time when area-wide pathological disturbances will occur, but they can say, and positively so, that they will happen in the Basin as they have elsewhere. Pathological remedies and substitute resistant seed varieties, in which the basic research has already been done, contain the remedies that will control both the extent and duration of the disasters.

V. LABOR PATTERNS

A. Family Labor Force

Labor, in its various aspects and characteristics is so important in small-scale farming that it warrants special treatment, although an economic treatise would probably prefer to treat it as other input.

Having already described family structure as much as was deemed necessary no attempt will be made here to detail size and functions of the family labor force. The questionnaire that formed the basis of data collecting during the first phase did contain a section in which enumerators were to specify whether or not children over 14 years of age and in the household at the time of the interview were active in the labor force and if so, to specify the type of activity. After repeated efforts to explain the meaning and purpose of the pertinent questions to the ever-changing members of the team from village to village, it was obvious the questions were too sophisticated to yield answers reliable enough for analysis, they were therefore discontinued. Questions concerning every-day farm chores, on the whole, were easily understood by both interviewers and interviewees, and their answers noted.

B. General Labor Force

1. Harvesting

Methods of labor used in the harvesting of rice yielded interesting results, both in terms of farm size and land management classification, i.e., type of irrigation used. In overall terms, the ani-ani was used on 71.5 percent of the farms. In almost two-thirds of the remaining 28.5 percent of the cases the sickle was used in combination with the ani-ani.

When the different land management units were considered separately, 84.3 percent of the rainfed operators used ani-ani harvesters exclusively. When the technical and semi-technical operators were combined with a third class in which both systems were in vogue, the percentage of ani-ani cutters fell to 59.3. Their respective employment frequencies

for male sickle harvesters exclusively were 15.7 and 40.7 percent respectively. The data are given in Table 15.

Size of enterprise did not prove to be as significant a factor in determining harvest methods as was land management. In units under .5 hectares, for example, 40 percent employed ani-ani harvesters exclusively; in those with between .5-.9 hectares the percentage was 12.8, but on all units 1 hectare or larger, the percentage rose again to 39.2.

Farmers who employed sickle labor exclusively, or in combination with ani-ani harvesters, had percentages in the same size intervals of 34.8, 33.3, and 31.9 respectively.

When the necessary explanatory notes were recorded by the enumerator, the sickle was generally preferred in harvesting of HYV's, reserving the ani-ani for traditional varieties. The distributions noted were affected by the factor of choice in types of seed planted by those able to afford the luxury of choice, as already noted. These were only the "large" and "largest" classes.

As might be expected, where harvesting was done by family workers and with the ani-ani, all but one case of the 24 came under the "small" unit class that measured under .5 hectares in size. The lone exception was in the .5-.9 hectare interval. None of the largest units (those having one or more hectares) depended on their family labor alone when ani-ani harvesting was done. (Details are shown in Table 16)

2. Threshing

Until recently threshing and grinding have been hand labor processes. In threshing, men and women participated with men in the majority because it was a flailing job. In grinding, on the other hand, men occasionally use the wooden pounding poles as pestles, whereas rice grinding, or pounding, has always been women's work. Economic necessity forced women to work, in turn it became a social function.

Village rice mills have been mandatory for a number of years whenever the number of farmers or volume of production justified their use. It has been the custom generally to carry threshed grain to the mills for grinding, although some of the mills were equipped to both thresh and grind. Change has taken place rapidly in the last five or six years and it has affected labor patterns in harvesting, threshing, and grinding processes. It has occurred most rapidly in the grinding process because of the large number of gasoline powered machines imported from Japan and installed permanently on the larger farms, or serving the smaller ones on a mobile basis.

Subsequent to 1970 there was a rise in imports of small machines rather than large ones which had capacities of two to four tons (paddy). Although the rise in the use of small machines required more labor, labor displacement is still of significant of proportions.

Differentiating between threshing and grinding turned out to be another area where interviewing difficulties were common. As a consequence, in the data that show a high incidence of "mill grinding" there might be included those who had their grain machine ground by one on the farm, either mobile or not. Further, "mill grinding" might have

included stalk rice to be threshed and ground. Likewise, when it was threshed at home, it may not have been flailed but also machine threshed. Table 18 gives the tabulated results in both threshing and grinding.

In the case of stalk rice, 50 percent was reported flailed on the farm by family members, another 42 percent by hired help, thus leaving only 8 percent to be threshed at the mill.

Quite a few pedal powered threshers were seen in use in the villages, but no record was kept of their numbers.

3. Grinding

Grinding at the mill has replaced home grinding -- in most cases this was the hand pounding method. Answers to questions that were intended to get better understanding of the technological change that has taken place (when it occurred, why, and an estimate of the number of women rice pounders displaced by machine grinding) were disappointing. There was sufficient response to the time element of the question to show that importation of Japanese machines began late in the 1960's and accelerated in the early 1970's so that by the time of this study mill grinding, either at home or in the village mill, had become widespread over the Basin. One farmer who operated 3.5 hectares volunteered that he usually employed women to grind his grain, or more literally, to pound it out, because by doing so he provided work opportunities to village women.

Universally, the answer to "why," was "cheap," and in many instances also that it was "better" to have the rice mill ground and polished than to continue hand pounding.

4. Ploughing

Variation in land preparation methods provides another significant opportunity to study labor patterns, and more importantly, to have an opportunity to glance into the immediate future and gain insight into the probable consequences of ongoing technological change.

Tractor use was found on 14.6 percent of farms on an overall basis. Tractors were encountered in 7 of the 10 cases of Desas studied. The two most isolated, inaccessible mountain villages and the swamp and lowland dominated areas in Paledah have none at present. They were reported most frequently in the two Central Java Desas, Cilopadang and Bantarpanjong, and in Desa Puhurwaya in West Java. The ECI Agricultural Appendix greatly underestimates tractor use with its assertion that none were found in Kabupaten Cilacap, unless the authors considered only the sub-project of Segara Anakan to represent all of that Central Java district, and its reporting of only 3 in Kabupaten Ciamis is far off the mark. It might be that tractor adoption climbed in the short interval between the period of the ECI estimate and this study. If this is the case, it forebodes much worse news for the host of laborers than is indicated in the comment concerning the social result of technological "advancement" to follow. Labor displacement by tractors might now be coming to epidemic proportions.

Two-thirds of the number of tractor operations were reported on the technical and semi-technical irrigation enterprises and one-third on the rainfed paddies. This latter incidence was not expected. (See Table 18)

The same type of distribution was found when farm size was the control. Two-thirds of the enterprises on which tractor land preparation was reported for the very large operations (in excess of one hectare), approximately one-fifth were found in the next or "large" class of .5-.9 hectares, and only one-sixth among the "small" farmers (see Table 19).

Ploughing with buffalo was a little more common than with tractors. Among the 234 farmers who reported their ploughing practices, 18.4 percent used buffaloes. In some cases they were animals they themselves owned, but the majority of farmers resorted to custom buffalo ploughing. Buffalo ploughing was found on 17.9 and 19.1 percent of the enterprises when classified according to their type of land management, and in terms of their sizes. Those details are shown in the tables, where percentages would have been equal except there is some variation in the number of events recorded in each. Buffalo ploughing was found in almost equal absolute numbers on rainfed and irrigated enterprises, but with many more farms in the former class the percentage on irrigated units was much higher. With 60 percent incidence of buffalo ploughing on the "very large" units, and 33 percent on the "large," this leaves only 9 percent for the "small" units.

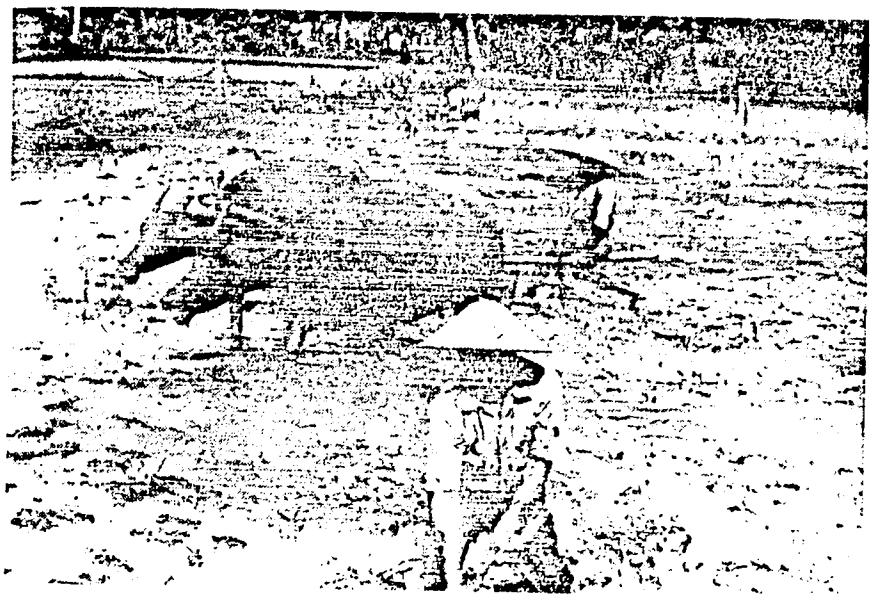
With buffalo values declared to be in the neighborhood of 90,000 rupiahs each, it was not surprising to find most of the buffalo ploughing done on a custom basis. When the animals were thus obtained, the custom rate was universally 1,000 rupiahs/buffalo day and 100 rupiahs wage for the man. When the farmer had both irrigated and rainfed paddy, buffalo ploughing was done on the irrigated land to shorten the interval between harvest and planting time, and hand hoeing was done on the rainfed paddy.

Hand hoeing was the predominant technique in preparing of the soil for planting. On an overall basis for 234 reporting farms, the percentage of its incidence was 64.9. Hand hoeing percentages varied slightly, being 67.5 for irrigated paddy and 66.3 for rainfed paddy. (See Tables 18 and 19)

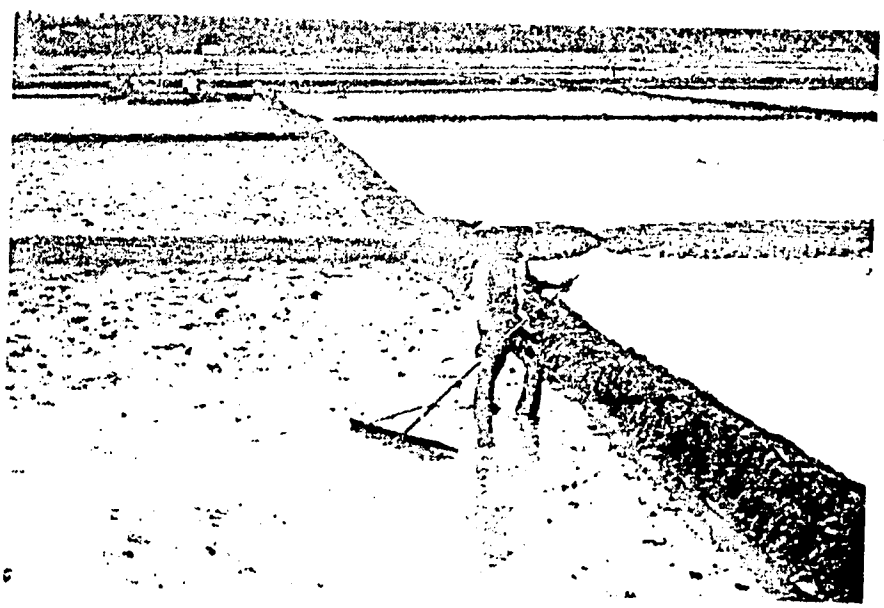
Although hand hoeing dominated all other techniques in land management systems, it was highest, 74 percent, in the rainfed enterprises; while in all combinations of irrigation systems it was 60 percent.

The practice of hand hoeing was highly associated with size of holding. It reached 100 percent among units in the under .125 hectare interval, and fell slightly to 91.3 percent in the interval .125-.24. Its declining importance continued to the .25-.49 interval where it was 88.3 percent, and to the .50-.99 interval, where it was 60.6 percent. Hand ploughing or use of the hoe reached its lowest levels on the large enterprises -- 40.4 percent in the 1.0-1.9 hectare interval, and then 38.4 percent in the 2.0 and over hectare interval.

THREE BASIC HAND JOBS



Woman Planting – Buffalo Ploughing – Hoeing



Hand Hoeing

5. Wages

Ani-ani harvesters, for the most part (80 percent), were paid in kind, receiving 10 percent of the bundles cut during the day's work period. The workers would take their 10 percent share to the field weighing station and would be paid or given credit according to weight of all bundles harvested. Of the 183 cases reported, 78.1 percent were paid the going 10 percent rate, 2.2 percent a lower rate, and the remaining 30 percent were paid at a higher rate. Percentages of payment depended on yield conditions of the fields so that when it was plainly evident the same amount of labor would result in lowered wages, the percentage to be given the harvester was raised accordingly.

When women turned in their bundles at the close of the day's harvest, their equivalent earnings usually averaged around 125 to 150 rupiahs. Among the men sickle harvesters, 97.4 percent also worked at a rate of 10 percent, but having a much faster cutting tool their earnings were about double those of the women ani-ani harvesters.

Specific details were not recorded, but village notes confirm discriminatory practices in wage rates that were highly in favor of the men. This was true in whatever phase of farm chores the respective workers were employed.

Wages for men performing hoeing tasks were recorded by only half of the enumerators, and are given in Table 20. Some employers provided meals for their workers, this was particularly true where fields were located a long distance from the villages. The meals were commonly served twice during each work day. The data of Table 20 indicate with or without meals, the wage was between 150-200 rupiahs per day. The data also indicated that a larger percentage worked for cash without meals.

While payment to plough hands was sometimes in cash, it was more frequently in kind, and was collectible at harvest time. It was asserted by those interviewers who responded to the Consultants' question that delayed payment assured the operators their harvest labor.

The labor techniques encountered in Bangunharja were unique. There, most frequently, answers to questions concerning plough labor came back to the Gotong Royong principle -- neighbor worked with neighbor to form plough circles, keeping the number of hired hands down to a minimum. This is confirmed by the few operator-laborers found in that village. When the Consultant learned this was the case and queried further into the matter, it was obvious the labor practice was influenced by the very high degree of social interaction that was found in this village. It was there that Farmers' Clubs, Farm Women's Clubs, and the only active Farm Youth Clubs were found most efficiently organized.

6. Summary

There is concrete evidence that hand hoeing dominates two-thirds of the enterprises in the Basin and is the source of earnings for the overwhelming majority of men who are employed in agriculture. Implementation of designs now under preparation for flood control and expansion of irrigation facilities will cut drastically into this long standing

Weighing in the Day's Ani-Ani Harvest

single source of employment for wage workers and croppers. The first "improvement" will allow lands that are periodically inundated to support the tonnages of both buffalo teams and tractors, and thereby, replace hand labor in both instances. Irrigation will make more multiple cropping possible. The entrepreneur in his desire to shorten the period when land lies dormant and idle between harvest and planting periods that now stretches out into weeks when the land is hand hoed, to a matter of days with faster ploughing techniques will be prone to choose the faster technique.

Technological change? Yes. Will it affect the Basin's agricultural sector, the laborers, the poorest of the poor, economically and socially?

Only planned alternate job opportunities will make it possible to avoid answering the question with a resounding "No." Forceful action will need to be taken to halt the present rate of increase in the growth of the rural labor force, a rate which is rapidly accelerating. Family "planning" without effective and universal action is not the answer.

The adverse economic and social trends that strike at all the main sources of employment for both women and men laborers -- as seen in all the labor inputs -- negate the project's feasibility and design calculations in which only the added man-years of labor resulting from flood and irrigation construction were considered. At best, those added years will be temporary, but they do offer the involved development agencies and their responsible officials time to launch complementary social and economic projects.

As support for the Consultant's pessimism over the problems that will result from the Basin Project's construction program, and the staggering number of workers -- men and women -- that have been, and will continue to be displaced by the substitution of machines, can be cited in the recent series of studies of varying rice milling processes made by the Agricultural Development Council (Bogor). Using data from this series to criticize technological change in rice milling in Java, in which the phenomenon of machine displacement of one hundred thousand hand labor jobs is clearly described, William L. Collier, Director of the recent studies, stated:

> "It appears that Dr. Timmer's estimate of the number of jobs lost is far too low. More important in terms of rural poverty, he has failed to give sufficient weight to the large number of women who, prior to the introduction of hullers, gained a sufficient share of their income from hand-pounding."[1]

Concerning the distribution of benefits from the innovations, Dr. Collier is likewise worried over their maldistribution, saying:

> "These innovations (Japanese-made engines called hullers) profit the landowners or the owners of the paddy....Yet as a result many female workers at hand-pounding are foregone with adverse distributional effects. These shifts in employment and income distribution will probably never be registered in a census on account of definitions of employment, but they can shake the foundations of village life."

---

[1] Choice of Technique in Rice Milling on Java, C. Peter Timmer, with a comment by William L. Collier and a reply by C. Peter Timmer, The Agricultural Development Council, N.Y., Sept. 1974. Underlining added.

To leave the problem with labor economic computations will provide a convenient manner to end this section in quantitative language that should convince the average rural development administrator of some of the consequences his work and that of his collaborators that need counter action. If the 1971 Indonesian rice crop of 18,123 million tons of gabah (unhusked rice) were hand pounded it would have created 1,939,000 full-time jobs. In marked contrast, using small rice mills (portable or permanent) only 90,000 full-time jobs were provided.[1]

While economists will differ in their interpretations of the social opportunity cost of capital in the two systems (some might even conclude their calculations favor machines!), the social consequences of the gross maldistribution of economic benefits will be apparent to anyone who will make the effort to live in the Basin villages long enough -- not only to visit them -- to see the idle crowds of manpower at all hours of the day and every day of the week.

The Consultant concludes that there is a bright potential for technological change in Indonesia, particularly he himself has seen the rate of agricultural productivity surpass that of all other industries. Farmers did use the fruits of technology to their limits. What is being overlooked in Indonesia is that technological change in agriculture never occurs in a vacuum. Unfortunately, it is being introduced into an economy where the masses still live pretty much on the fringes of its great resources, and where 80 to 90 percent of the population has no other means of employment other than farming. Disaster lies ahead, unless government planners, and their bi-lateral and multi-lateral collaborators in development, take steps to correct this situation.

Today's industrialized nations had a rising industrial development that was able to absorb the masses of workers who then, too, were in their respective agricultural sectors. In those countries, agricultural modernization was always a step behind, not ahead, of industrial development, and continued population expansion is causing them to give second thoughts to the processes of change. It is the coordination of industrial-agricultural growth that allows prosperous social and cultural patterns to develop. (A truism that has not always been recognized by economic planners.)

The Consultant would volunteer one other personal judgment. Countries now emerging from millennia of underdevelopment will not have the prospect of a fast rising industrialization, as did those now developed. Other sources have to be sought to guide technological change, and these cannot help but include a deliberate slowing down of technological change while its necessary corrolary, social change, is allowed to blossom and grow.

VI. FARMERS' ORGANIZATIONS

A. AES Sponsored

The Agricultural Extension Service (AES) has adopted three major types of group activities with which this final chapter will be concerned, and for which global statistics were received

---

[1] Ibid., pp. 16-17.

from its director in Kabupaten Ciamis. They are Farmers' Clubs, Home Makers' Clubs, and Youth Clubs, all of whose organization are formally the responsibility of the AES agent in the Kecamatan, the Penyulu Pertanian Lapangan. Technically he is under the supervision of the extension directorate in the Kabupaten, and administratively he comes under the direction of the Camat, subdistrict or Kecamatan's chief political officer. The Camat, in turn, assigns the PPL to work in the desas where he would be most productive. There, he reports to the unit's chief political officer and is then in operational contact with the farm officer (Pamong Tani Desa) of the village complex.

Statistics given by the Kabupaten Directorate of Agriculture report the following information for the Regency of Ciamis where all but two of the villages are located. These villages were studied in Phases One and Two:

Farmers' Clubs		Homemakers' Clubs		Youth Clubs	
Number:	568	Number:	35	Number:	20
Members:	11,360	Members:	880	Members:	400

1. Farmers Clubs

If the directorate's information concerning numbers of farmers (Table 7) is used as the base for calculations of farmer participation in organized group activities, the result shows that the overwhelming share of group organization or work still lies ahead for the AES. Kabupaten Ciamis had 154,000 farms, and it appears that these are all owners. Another 201,000 farm croppers are likewise reported but the data do not make it clear what their relationship to the previously cited number of owners might be. There may or may not be that many cropper families among whom some of the 154,000 owners have divided their farms for operation, or they may be cropper laborers for an undetermined number of other additional operators, including absentee owners who may have residence in the cities of the Kabupaten, or elsewhere.[1]

Using the number of farm owners reported as being 154,000, only 7.4 percent of all farmers in the Kabupaten belonged to a Farmers' Club, and if the 201,000 farm cropper families are also added to the base computation, the percentages become miniscule.

From Table 21, in which membership in Farmers' Clubs is considered in relationship to tenure classification of the farm sample, two facts stand out. One, the laborer-operator class is noticeably absent among all the others who reported their memberships. This

---

[1] Reliance on bi-lingual secretaries for translation of questionnaire items into the vernacular may not have produced concepts to distinguish clearly the differences that obtain between the several tenure classes. The classes for which data were sought were owner-operators, landlords who either cash rent or share crop their holdings, share croppers, and farm laborers. Therefore, when the translated concepts were applied by the field staff, who but for one exception were not trained in agricultural economics or farm management, erroneous tenurial distinctions might have caused the numbers herein reported as belonging in the different classes and undoubtedly contain some errors.

is as might be expected in an agricultural economy at or so near a subsistence level, and where labor organizations in the industrial sector are likewise still in their infancy. Two, the owner-operator and landlord classes account for two-thirds of the membership, and when public employee-farmers are added the three account for more than nine-tenths of all who are club members.

While the total interviewed sample of farmers yielded a farm membership incidence of 33.5 percent, as compared to the much smaller percentage given by the Kabupaten statistics, a strong case could be made to the effect that, in view of the manner in which the sample was drawn (convoked in the village headmen's office), much smaller numbers of laborers entered the sample than would have in a more randomly chosen one. This, then, would have had the effect of lowering the incidence of membership found in the study, but how much nearer to the officially reported one, cannot be determined.

Whether or not one belongs to a Farmers' Club is a function of size of his enterprise, together with tenure. The larger the operation the more likely it is that he will be a member in such a group. This is clearly shown by the distributions in Table 22, where over half of the "largest" sized farmers, those with more than 1.0 hectare of sawah, were members of local clubs. The proportion was two-fifths when the "large" are defined as those having from one-half to one hectare, and then it dropped to less than one-sixth among the "small" farm category.

The significance of the influence of tenure and farm size will be answered only when there is a fully representative sample of Basin farmers.

One unlooked-for bit of information, the distributions in these two tables do suggest that the method used in "drawing" the sample for this study was a very deciding factor in determining the events that were selected. Having to depend upon the local village headman to bring farmers together on so short a notice meant that he gathered those most accessible to him, and the social stratification that obtains in all villages would place the more influential of their citizens in closer proximity to the village hall site. Furthermore, entrepreneurs who had the greatest freedom in deciding use of their time, including time to attend meetings, would be among the more affluent, as measured by their occupying the higher rungs of the tenure ladder and being in the largest farm-sized intervals.

Farmers' Clubs were more interesting and much more revealing to study than were the Water Users' Organizations, especially when the latter were found not to be farmer but purely fiat created. The farmers who held membership in the WUA's were also members of the Farmers' Clubs. Those members were enthusiastic participants in both groups, had no complaint against official dominance in their orgainzations, and were fully content with the dues or fees incurred through membership. It was surprising to discover membership dues in clubs because in preliminary discussions with extension personnel it had been assumed the clubs were organized as purely educational institutions for the distribution of information and were open to anyone who wanted to participate. That was somewhat of an erroneous assumption. All WUA's charge fees, because their services can only be provided after considerable expenditures of money have been made, including

services of the ditch rider who is responsible for measuring the quantity of water a member will receive as well as assigning the day of the week or time of the day such water would be allowed to flow.[1]

Membership in and presence or absence of Farmers' Clubs varied greatly among the Desa units studied. The highest percentage of farmer participation occurred in Bangensari, 90.0 percent, and this village was closely followed by Langensari's 80.0 percent. In a middle group, Bantarpangjon, Padaherang, and Puhurwaja were closely grouped, with 50.0, 47.6, and 44.4 percent reporting membership respectively, and then Paledah, with 26.6 percent. In the lowest group were Banjar, with 15.4 percent, and Padaringan and Sengkong, both reporting zero membership.

The official monografi, when available, gave statistics concerning farmers' organizations, as did the AES information officer when he was found in his Kecamatan office. Five Kelompok Tani (translated it means farm club) were reported to be in Padaherang with a total of 100 members, and Paledah had a total of four clubs will about 60 members. While several farm clubs were said to be active in Puhurwaja, neither their numbers nor membership were available. The kampongs into which the team was directed did not always coincide with those where the AEC had the greatest amount of activity. However, the sample showed a larger number of club members than were officially reported for the Regency.

Variance in the village percentages of membership were dependent upon the effectiveness of the Kecamatan and Desa farmer agents. The farmer agents were found to be most aggressive and active in group work where their superiors -- not in terms of technical matters but in administrative -- were also active in farm work. That is, wherever a Camat, Kuwu, or Lurah demonstrated his interest in the welfare of his farmer constituents' participation in volunteer activities, he was also to be seen promoting such activites through both the PPL and PTD. In contrast, where such political functionaries were just that -- functionaries who followed political orders -- there the respective bailiwicks were among the poorest found -- poorest in the sense of having little or no group activity except that which was purely functionary in process and formal in its organization.

Clearly, therefore, group behavior, as does individual, has its psychological variants and stimuli.

While no male club members were found in Padaringan, as above noted, their absence was accounted for by the fact that the extension agent, PPL, was a woman officer. She traveled her area of five villages by use of a bicycle. Although she was the farm agent,

---

1 One other fee should be mentioned, bengkok or janggon payments. The first term is from West Java and the second is used in Central Java. They describe the prebend tradition of rendering payment to village officials. Most common was an assignment of 1,000 bata (1.4 hectares) of paddy to the headman, from which all the harvest was assigned for his personal use. The portion was usually around 600 bata for the secretary, and 500 for the PTD, diminishing in size as did the recipient official's rank. In some cases, payments were reported in rough rice, quantities being commensurate with size of assigned plots.

having taken the same technical school course which all PPL's attend, she had concentrated on organizing Farm Women's Clubs and not Farmers' Clubs. Nine women's clubs had been organized in the five village-complex, of which only 3 were active with a total membership of 45.

The generic concept of Kelompok Tani took on meaning in the communities where members chose names of their preference to designate their clubs. In Bangunharja, the club to which the respondents belonged was called Tani Utama. Each member was assessed a seasonal fee of 3 kgs. rough rice, and the chairman was proud to declare "100 percent are paid up."

2. Farm Women's Clubs

As the Kabupaten AES statistics indicate, Home Makers' or Farm Women's Clubs are few in Ciamis. Consequently, when the farmers interviewed were questioned concerning club activities for their wives, an untrodden area, or nearly so, was encountered. Only 18 percent answered, "Yes," their wives had membership in one of the community Kelompok Wanita Tani. While 40 percent answered, "No," a larger percentage (42%) were perplexed by the question.

To illustrate their possible ignorance of the functioning of a Home Makers' Club, farmer after farmer rationalized his spouse's non-membership with the remark, "She was too old." Obviously their ideas of whom such a club might serve were influenced by the social connotation of the word "club." There was no comprehension concerning what a group of women might do or work at in home making, when wives barely in their forties were said to be "too old" for "club" activities.

Interviews obtained one-fifth of the Farm Women's Clubs members in Bangunharja, as well as Puhurwaja, and not quite a fourth in Langensari. Then four were found to be established in Padariangan, and two each in Sengkong and Bantarpajong. The AES Information Officer in Padaherang reported there was one club in the Kecamatan which had 21 members, but the Kampong where the club was located did not fall into the sample of those studied.

There was, however, no absence of social club work in most villages as attested to by the frequency with which wives were reported as belonging to a social welfare (PKK), religious, or educational club. Forty-two percent of the wives had membership in one or more of these clubs and 51 percent did not; the remainding percentage of farmers were not cognizant of their wives' participation, and a few were ignorant concerning the question's significance. The few in this last category contrasts strongly with the large proportion who were ignorant of the meaning of Farm Women's Clubs, as would be expected. The PKK is nation-wide, a social welfare club of wives of all public functionaries: membership is obligatory, and their member numbers and club varieties are determined by the size of the bureaucracy and its differing departments in a locality. Invariably, officership in them follows the same pecking order which indicates their respective husbands' ranking, with the "colonel's" wife, of course, always the chairman, and other officers fall downward in rank accordingly.

3. Leadership in Clubs

Whether one held membership in a farm club was seen to be a function of farm size indicating that one is expected to reach a status that puts him among those in the upper half (measured in terms of size of operation) of farmers in his village before joining a club. This observation is borne out by so many of respondents commenting "not yet" when the question of membership was asked.

However, whether one is or has previously served as an officer in his (her) club, very definitely is a function of tenure and farm size. Among the 34 farmers who answered that they were then or had served previously as officers, 15 were in the employee-operator class, 16 were owner-operators, 2 were landlords and 1 was a share-cropper. The latter was the same person referred to previously. None of the laborer-operators had ever served in this capacity, although a few did belong to farmer clubs.

In terms of size of operation, the 34 officers were distributed as follows: 25 fell into the "very large" class interval, 6 in the "large," and 3 in the "small." All the latter three were employee-operators, religious teachers or village officers who operated small farms by choice, as was said above, not because of necessity as the overwhelming majority have to do who occupy that same size interval. In other words, leaders do not come from small farms. The same situation was found to obtain in women's clubs.

The fact that the majority of the club officers tend to be village officials, teachers, or retired army personnel is a fair reflection of how far such organizations must travel before they become true farmer-controlled, voluntary educational institutions.

4. Farm Youth Clubs

The last item in club activity had to do with youth. Although the question was asked very specifically (Does the village have Farm Clubs for boys or girls?), invariably it was stated that there was the Pramuka Taruna Bumi (Boy Scouts). With less frequency there were "sports" clubs and other forms of social clubs in the schools. There were 10 in total that could be classified under Farm Youth Clubs. All clubs but one were located in Bangunharja. It was there that activity with farm youth was so conspicuous when compared with the other villages, as were the numerous Farmers' and Farm Women's Clubs, and the superbly functioning Water Users' Association. There the youth club was called Tani Utama II, to distinguish it from the Farmers' Tani Utama I.

It was not surprising to find so few farm clubs for boys and girls among sample farmers when the Agricultural Directorate for Kabupaten Ciamis reported the existence of only 20 such clubs. In all of the Regency there was an estimated membership of 400 youths.

A novel approach to "youth" work was encountered in Bangunharja. Young married men in their twenties or early thirties were invited to join younger youths in one of the Tani Utama II clubs. When visited, the club had 38 members; it had a group project consisting of 200 bata of lowland which the club rented and planted in rice. The plot yielded some 1,200 kgs./season and the members were holding 5,600 kgs. of rough rice

in storage. Income from this group-operated farm is used for welfare needs of members and group sport activities. The local PTD functioned as chairman of the club.

B. Sources of Innovation Stimuli

1. Specific Channels

Among the attitudinal questions on which farmers were asked to express their opinions was one which asked who in their experience had been most useful as a source of innovative ideas. Tabulating the responses by tenure class, some suggestion is given that tenurial level of a farmer does determine his source of innovative information (shown in Table 23).

Farm croppers seem to follow the same pattern as did the landlords when seeking information. The sole source of information and the one most frequently mentioned among the owner-operators was the PTD.

Was this only because he was present at all interviews and because it was he upon whom farmers relied for help in interviews when they seemed to be uncertain of facts?

He was after all, the change agent closest to most farmers. With both laborers and croppers, the Lurah and PTD were most prominently mentioned. The preference of employee-farmers and owner operators was the AES PPL, alone or in collaboration with the PTD.

The foregoing opinions concerning most probable sources of technical help do tend to fit into a logical analysis in the sense that the smallest and least important farmers in the communities were more prone to seek advice from the least sophisticated source of such advice.

The most frequently mentioned sources of information were the PTD and PPL in their joint efforts at bringing about induced change, the total came to 36.0 percent. The PTD working alone outranked the PPL, the respective percentages were 26.8 and 17.0. Almost 11 percent of farmers replied no one was consulted for advice or ideas and 2 percent reported "other" sources. These other sources tended to be references to their listening to radio programs.

The above distributions coincide closely when the farmers are compared by size of their operations to sources of information. Among the "largest" operators, 68.2 percent patronized the AES PPL, alone or in collaboration with the PTD, as compared to 51.0 percent among the "small." While only 20.7 percent of the first or large class sought information from the Lurah and or PTD, this percentage rose to 44.8 with the second or small class of farmers.

2. Village Variation

As the analysis has frequently pointed out, great variations were found in and between desas in the respective kecamatans. Nowhere was this more pronounced than here when

sources of stimuli for change are considered. The three desas in which the most enthusiastic and greatest amount of induced change activity was found occurring were Banguharja, Langensari, and Padaherang. The percentages that indicated the AES PPL in joint collaboration with the PTD were highest in these desa units, 90 percent, 100 percent, and 90 percent, respectively.

The smallest value found when this index of change was used was at the 10.0 percent level. Its place of occurrence is not important; it was there where the only open criticism and hostility toward change agents occurred and where rapport between the team and kecamatan officials was the lowest.

To summarize this analysis of group inputs Bangunharja Desa again serves to illustrate what occurs when extension resources are used to their fullest. There, every group of educational resource was efficiently adopted -- water users, farm clubs, homemakers and youth clubs, and demonstration plots, with 100 percent input from the two-member change agent team, the PTD-PPL.

The effect on the production of rice, with which this evaluation is chiefly concerned, has been previously described. It occurred because the PPL, who has to drive all the way up the mountain roads on his motorcycle from his kecamatan office, gave the village cluster a day's help each week. Doing so he meets with farmers at their kampong demonstration plots which he helped plan and organize. He alternates in attendance at weekly meetings held at the homes of Tani Utama I and Tani Utama (Taruna II) members, and when he isn't in attendance he provides the PTD with discussion topics for their meeting.

If one takes into consideration the locale of this desa complex with its near 9,000 inhabitants far up the mountainside and not in the favored Banjar plains, nowhere would he have seen more efficient use of land and its resulting productivity than in that desa's 1,550 hectares of upland crops and 560 hectares of rice paddy. Bangunharja's change agents' work has also fully involved them in the cultivation, harvesting, and marketing of upland crops. Not to belabor this somewhat extraneous topic, but merely to touch on it with a few illustrative families who have so efficiently managed multiple enterprise activity, the following are cited. At one end of the management scale, but where efficiency can be most plainly seen at the small level, could be placed a couple, the man now 65 and his wife 55. Their .07 hectares of paddy produces 500 kilograms in the two combined seasons but tea leaves picked twice monthly, April through July, by the wife brings a yield of 20 grams for each picking, while 7 coffee trees harvested in November yield their fruit in varying amounts depending on growing conditions.

Another couple, a little younger, 53 and 45, cultivate .5 hectares of paddy without hired help, but do call on older children no longer living at home to help in the harvest of 50 coconut trees monthly, 15 clove trees twice yearly, and 50 coffee trees every November. A final illustration shows the productive management of .35 hectares (250 bata) of paddy, a variety of upland fruit, and 70 bata of fish ponds. The fish are of three differing species and mature and are marketed at their appropriate ages.

If Bangunharja could accomplish this – with small farms – why didn't more?

A full answer would produce a treatise in itself but one simple truth is evident -- full and voluntary effort between farmers, change agents, and village officials accounted for much of the success.

3. General

The superordering and structure of the AES and its pecking order in the political hierarchy, as laid out in the opening paragraph of this chapter, was detailed intentionally to show how far removed the professional agricultural officer (national or expatriate) is placed from the front (the kampong) where actual contact with farmers is made. He does develop national policy and give commands, but there is no way of knowing how effective he is as an officer unless he spends some of his time with the farmers.

It is at this point the Social Soundness Survey team found the weakest link of the Citanduy Basin Development Project. When communication between Project staff, the Coordinating Committee, and their professional advisors does not reach below the provincial and kabupaten levels, when professionals, in the case of agriculture, are not in direct touch with the two change agents who work at the farm level, the PPL and the PTD, their contact with the farmer is minimal.

On whatever measures employed -- size of enterprise, tenure status, production and productivity, club membership and participation, irrigation, attendance at meetings, voice in public planning -- the analysis has brought out bi-modal distributions, large and small.

To minimize discrimination against and to maximize participation of the small farmer should be the major objectives in the implementation of the project, with cost a secondary consideration. If support is required for this conclusion, references could be made to statements that were reported in the press almost daily during the Consultant's stay in the Basin. In these statements high-ranking government officials, including regional governors and cabinet members, deplored the prevailing universal practice of the professionals' planning and execution of public works without inviting the public to participate in their planning and design. If Project leaders heed this advice, small farmers will reap the benefits.

TABLES

TABLE 1

AGE OF HOUSEHOLD HEAD AND TENURE STATUS

Age (yrs.)	Tenure Status: Landlord No.	Landlord %	Owner-Operator No.	Owner-Operator %	Cropper No.	Cropper %	Farm Laborer No.	Farm Laborer %	Employee-Farmer No.	Employee-Farmer %	Total No.
1.26 - .24	--	--	14	12.9	1	11.1	9	26.5	15	28.4	39
.25 - .49	4	20.0	42	38.8	3	33.3	19	55.9	30	44.8	98
.50 - .64	12	60.0	36	33.3	5	55.6	6	17.6	17	25.4	76
.65 or more	4	20.0	15	13.9	--	--	--	--	5	7.4	24
N.A.	--	--	1	.1	--	--	--	--	--	--	1
Total	20		108		9		34		67		238
Percent	8.4		45.4		3.8		14.3		28.2		100.0
Mean Age	54.8		44.3		45.5		34.3		41.6		

TABLE 2

AGE OF HOUSEHOLD HEAD AND SAWAH LAND AREA

	Area of Sawah Land (has.)												
Age	Under .125 No.	%	.125- .24 No.	%	.25 - .49 No.	%	.50 - .99 No.	%	1.0 - 1.9 No.	%	2.0 + No.	%	Total No.
20 - 24	1	11.1	12	30.1	12	21.0	9	12.8	4	11.8	1	3.7	39
25 - 49	3	33.3	17	17.4	26	45.6	30	42.9	11	32.3	11	40.7	98
50 - 64	4	44.4	8	10.7	12	21.0	22	31.4	16	47.0	13	48.1	75
65 +	1	11.1	3	12.5	6	11.5	9	12.9	3	8.9	2	7.4	24
N.A.	--	--	--	--	1	1.0	--	--	--	--	--	--	1
Total	9		40		57		70		34		27		237
%	3.8		16.9		24.1		29.4		14.4		11.4		

TABLE 3

AGE 7 HOUSEHOLD HEAD AND EDUCATION

Age (yrs.)	Education Status: Illiterate No.	Illiterate %	Elementary Graduate No.	Elementary Graduate %	Secondary High School No.	Secondary High School %	Total No.	Total %
20 - 34			27	16.6	11	31.4	38	
35 - 49	10	26.3	70	42.9	18	51.4	98	
50 - 64	19	50.0	52	31.9	4	11.4	75	
65 +	8	21.1	14	8.6	2	5.8	24	
N.A.	1	2.6	--	--	--	--	1	
Total	38	16.1	163	69.0	35	14.8	236	100

TABLE 4

EDUCATION OF HOUSEHOLD HEAD AND NUMBER OLDER CHILDREN AT HOME IN SCHOOL

Education of Head	Number Older Children at Home in School								
	None		One		Two		Three		Total
	No.	%	No.	%	No.	%	No.	%	No.
Illiterate	21	27.6	3	12.5	--	--	--	--	24
Elementary	51	67.1	18	75.0	8	88.9	8	72.7	85
Secondary & High School	4	5.2	3	12.5	1	11.1	3	27.3	11
Total	76		24		9		11		120
Percent	63.6		19.8		7.4		9.1		

TABLE 5

OCCUPATIONAL CHOICES OF OLDER CHILDREN AND EDUCATION OF HOUSEHOLD HEAD

Education of Head	Children's Occupational Choices												
	One Separated				Two Separated				Three Separated				
	Farm		Nonfarm		Farm		Nonfarm		Farm		Nonfarm		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Total
Illiterate	6	28.6	2	10.5	5	41.7	2	28.6	5	45.5	--	--	20
Elementary	15	21.4	16	84.2	7	58.3	4	57.1	6	54.5	14	82.3	62
Secondary or High School	--	--	1	5.3	--	--	1	14.3	--	--	3	12.2	5
Total	21		19		12		7		11		17		87
Percent	24.1		21.8		13.8		8.0		12.6		19.5		

TABLE 6

EDUCATIONAL LEVEL AND TENURE STATUS, HEADS OF HOUSEHOLDS

	Tenure Status												
	Landlord		Owner Operator		Renter		Share Cropper		Farm Laborer		Employee Farmer		Total
Education	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Illiterate	3	15.0	19	17.9	--	--	4	44.4	6	18.2	6	9.0	38
Elementary	15	75.0	77	72.6	--	--	5	55.6	26	78.8	39	58.2	162
Secondary or High School	2	10.0	9	8.5	1	--	00.0	--	1	3.0	22	32.8	35
Total	20		105		1		9		33		67		235
Percent	8.5		44.9		0.4		3.8		14.0		28.4		

TABLE 7

FARMS, BY SIZE (HA.) AND NUMBER*
KABUPATEN CIAMIS

Size, Ha.	Number	Percent
Under 0.25	96,727	62.7
0.25-0.49	31,637	20.5
0.50-0.99	18,986	12.3
1.00-1.99	5,608	3.6
2.00 and more	1,331	0.9
Total	154,289	100.0

Farm Tenure

Farm owners	154,289 (Petani pemilik)
Farm renters	
Farm cropper	201,244 (Petani penggarap)

Farmers, Homemakers, and Youth Clubs

Farmers Clubs	Homemakers	Youth Clubs
No.: 568	No.: 35	No.: 20
Members: 11,360	Members: 880	Members: 400

* Source: Dinas Pertanian Kabupaten
DT. II, Ciamis
12 November 1975, Private Communication.

TABLE 8

TYPES OF FARM ENTERPRISES

Type of Farm Enterprise	Number	Percent
Contains both Upland and Lowland Sawah	192	80.7
Only Sawah and one Plot of That	28	11.8
Only Sawah but multiple Plots	17	7.1
No Land Farm Laborer	1	.4
Totals	238	100.0

TABLE 9

TOTAL AREA OF SAWAH LAND

Farm Size (has.)	Number	Percent
Under .125	9	3.8
.125-.24	40	16.8
.25-.49	57	23.9
.50-.99	70	29.4
1.0 -.1.9	34	14.3
2.0 or More	27	11.3
No land	1	.4
Total	238	99.9

TABLE 10

CLASSIFICATION OF IRRIGATION SYSTEMS ACCORDING TO DESA

	Irrigation System										
	(1)		(2)		(3)		(4)		(5)		
Desa	Technical No.	%	Semi-technical No.	%	Rainfed No.	%	Combined 1 & 2 No.	%	Combined 1 and/or 2 & 3 No.	%	Total No.
Puhurwaja	12	44	5	19	1	4	2	7	7	26	27
Banjar	2	8	--	--	21	81	1	3	2	8	26
Padahurang	--	--	1	5	20	95	--	--	--	--	21
Paledah	--	--	--	--	27	100	--	--	--	--	27
Langensari	8	38	--	--	9	43	--	--	4	19	21
Padarinjan	--	--	2	6	29	81	1	3	4	11	36
Bangunharja	6	29	8	38	1	5	2	10	4	19	21
Cisaga I	22	79	4	14	1	4	1	4	--	--	28
Cilopadang	10	91	1	9	--	--	--	--	--	--	11
Bantarpanjong	--	--	3	17	13	72	--	--	2	11	18
Total	60	25	24	10	122	51	7	3	23	10	237

TABLE 11

CROP PRODUCTION RATIOS AND TYPE OF IRRIGATION FACILITY

Production Ratio	Type of Irrigation (1) Technical No.		(2) Semi-technical No.		(3) Rainfed No.		(4) Combined 1&2 No.		(5) Combined 1 or 2 & 3 No.		Total No.	
		%		%		%		%		%		%
Under 1.0	11	18.0	4	16.6	19	15.6	1	14.2	3	13.0	38	16.0
1.0	7	11.6	--	--	9	7.4	--	--	1	4.5	17	7.2
1.0 - 1.4	15	24.6	--	--	27	22.1	--	--	3	13.0	45	19.0
1.5 - 1.9	8	13.0	4	16.7	52	42.6	3	42.9	13	56.5	80	33.8
2.0	20	32.8	16	66.7	13	10.7	3	42.9	3	13.0	55	23.2
Loss	--	--	--	--	2	1.6	--	--	--	--	2	.8
Total	61		24		122		7		23		237	100.0
Percent	25.7		10.1		51.5		3.0		9.7			

TABLE 12

CROP PRODUCTION RATIOS AND FARM SIZE

Production Ratio	Farm Size (has.) -.125 No.	%	.125-.24 No.	%	.25-.49 No.	%	.50-.99 No.	%	1.0-1.9 No.	%	2.0-5.0 No.	%	Total No.
Under 1.0	14	77.8	13	37.1	6	13.6	2	3.6	2	3.6	--	--	37
1.0	1	5.5	4	11.4	5	11.4	3	5.4	2	3.6	2	7.7	17
1.0 - 1.4	3	16.7	10	28.6	15	34.1	9	16.0	6	10.9	2	7.7	45
1.5 - 1.9	--	--	5	14.3	11	25.0	29	51.8	24	43.6	11	42.3	80
2.0	--	--	3	8.6	7	15.9	13	23.2	21	38.2	11	42.3	55
Total	18		35		44		56		55		26		234

TABLE 13

PROPORTIONS OF RICE CONSUMED AT HOME AND SOLD, BY TENURE CLASS

Proportions Consumed and Sold	Tenure Classification											
	Landlord		Owner-Operator		Share Cropper		Farm Laborer		Employee Farmer		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Consumed	3	15.8	27	25.0	6	66.7	27	81.8	27	40.3	90	38.1
All Sold	--	--	2	1.9	--	--	1	3.0	1	1.5	4	1.7
Both	16	84.2	79*	73.1	3	33.3	5	15.2	39	58.2	142	60.2
Total	19		108		9		33		67		236	

*Includes one Renter.

TABLE 14

CHOICE OF SEED VARIETIES AS RELATED TO AREA OF PLANTING (has.)

Seed Variety	Farm Size in Hectares													
	Under .125		.125 - .24		.25 - .49		.50 - .99		1.0 - 1.9		2.0 & more		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
HYV	11	64.7	28	84.9	38	86.4	45	80.4	46	85.2	22	81.5	190	82.4
Traditional	6	35.3	5	15.1	6	13.6	7	12.5	6	11.1	2	7.4	32	13.7
Both	--	--	--	--	--	--	4	7.1	2	3.7	3	11.1	9	3.2
Total	17		33		44		56		54		27		231	

TABLE 15

HARVEST LABOR USE ACCORDING TO LAND MANAGEMENT CLASS

	Irrigation System											
	(1) Technical		(2) Semi-Technical		(3) Rainfed		(4) Technical & Situation		(4) Combination All Three		(6) Total	
Labor Pattern	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Family Labor Ani-Ani	10	16.7	3	12.5	9	7.4	--	--	1	.4	23	9.8
Hired Labor Ani-Ani	15	25.0	9	37.5	66	54.6	2	28.6	9	39.0	101	43.0
Hired Labor Sickle	18	30.0	3	12.5	2	1.7	--	--	2	.8	25	10.6
Hired Labor Both Tools	5	8.3	5	20.8	14	11.6	3	42.9	5	21.6	32	13.6
Hired & Home Both Tools	--	--	--	--	3	2.5	2	28.6	4	17.1	9	3.8
Hired & Home Ani-Ani	12	20.0	3	12.5	27	22.3	--	--	2	.9	44	18.7
Family Labor Sickle	--	--	1	4.2	--	--	--	--	--	--	1	.4
Total	60		24		121		7		23		235	

TABLE 16

HARVEST LABOR USE ACCORDING TO FARM SIZE (HAS.)

Labor Pattern	Under .125 No.	%	.125 - .24 No.	%	.25 - .49 No.	%	.50 - .99 No.	%	1.0 - 1.9 No.	%	2.0 & Over No.	%	Total No.	%
Family Labor Ani Ani	8	3.4	10	28.6	5	11.4	1	1.8	--	--	--	--	24	10.3
Hired Labor Ani Ani	2	11.1	8	22.9	17	38.6	25	44.6	30	55.6	18	66.7	100	42.8
Hired Labor Sickle	2	11.1	3	8.6	5	11.4	9	16.1	2	3.7	3	15.0	24	10.3
Hired Labor Both Tools	--	--	2	5.7	5	11.4	11	19.6	12	22.2	2	7.4	32	13.8
Hired & Home Both Tools	--	--	2	5.7	3	6.8	2	3.6	2	3.7	--	--	9	3.9
Hired & Home Ani Ani	6	33.3	9	25.7	9	20.5	8	14.3	8	14.8	4	14.8	44	18.9
Family Labor Sickle	--	--	1	2.9	--	--	--	--	--	--	--	--	1	.4
Total	18		35		44		56		54		27		234	

TABLE 17

LABOR PATTERNS IN THRESHING AND GRINDING

Labor Pattern	Threshing		Grinding	
	No.	%	No.	%
On the farm by Family Labor	116	50.0	50	21.5
On the farm by Hired Labor	97	41.6	--	--
On the farm by both Family & Hired	1	.3	--	--
At the Mill	18	7.7	177	76.0
At Mill & Home	1	.3	6	2.5
Total	233		233	

TABLE 18

LABOR PATTERNS IN PLOUGHING ACCORDING TO LAND MANAGEMENT CLASS

	Irrigation System									
	Technical		Semi-technical		Rainfed		Combined Technical Situation		Total	
Labor Pattern	No.	%	No.	%	No.	%	No.	%	No.	%
Family Labor										
With hoe	11	19.0	5	22.8	14	11.8	2	10.0	32	14.6
With buffalo	--	--	1	4.5	2	1.7	--	--	3	1.4
Hired Labor										
With hoe	6	10.3	4	18.2	39	32.8	1	5.0	50	22.8
Tractor	13	22.4	3	13.6	12	10.1	4	20.0	32	14.6
Family & Hired										
With hoe	21	36.2	2	9.0	35	29.4	8	40.0	66	30.1
With buffalo	7	12.0	7	31.9	17	14.3	5	25.0	36	16.5
Total	58		22		119		20		219	

TABLE 19

LABOR PATTERNS IN PLOUGHING ACCORDING TO SIZE OF FARM

Labor Pattern	Farm Size (has.) Under .125 No.	%	.125 - .24 No.	%	.25 - .49 No.	%	.50 - .99 No.	%	1.0 - 1.9 No.	%	2.0 & Over No.	%	Total No.	%
Family Labor														
With hoe	11	61.1	11	32.4	8	18.6	2	3.8	--	--	--	--	32	14.2
With buffalo	--	--	--	--	--	--	2	3.8	1	1.9	1	3.8	4	1.8
Hired Labor														
With hoe	3	16.7	6	17.7	13	30.2	14	26.4	10	19.2	5	19.2	51	22.6
Tractor	--	--	1	2.9	4	9.3	7	13.2	12	23.1	9	34.7	33	14.6
Family & Hired														
With hoe	4	22.2	14	41.2	17	39.5	16	30.2	11	21.2	5	19.2	67	29.5
With buffalo	--	--	2	5.8	1	2.4	12	22.6	18	34.6	6	23.1	39	17.3
Total	18		34		43		53		52		26		226	

TABLE 20

DAILY WAGE RATES PAID PLOUGH LABOR

Rate	Amouts Paid Daily (rupiahs) Without Meals No.	%	With Meals No.	%
Under 150	1	1.8	10	13.0
150 - 200	34	60.7	47	61.0
201 - 250	10	17.9	11	14.3
Over 250	11	19.6	9	11.7
Total	56		77	

TABLE 21

MEMBERSHIP IN FARMERS' CLUBS

BY TENURE CLASS

Membership	Landlord		Owner Operator*		Share Cropper		Laborer-Operator		Employee-Operator		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	7	36.9	45	42.0	3	33.3	4	12.1	20	29.9	79	33.5
No	7	36.9	43	39.4	4	55.6	18	54.6	24	35.8	97	41.1
None Available	5	26.3	20	18.6	1	11.1	11	33.3	23	34.3	60	25.4
Total	19		108		9		33		67		236	

* Includes 1 renter

TABLE 22

MEMBERSHIP IN FARMERS' CLUBS

BY SIZE OF ENTERPRISE (has.)

MEMBERSHIP	Size of Farm (has.) Under .125		.125 - .24		1.25 - .49		.50 - .99		1.0 - 1.9		2.0 +		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No	%	No.	%
Yes	1	5.6	4	11.8	10	22.7	21	37.5	30	54.6	13	48.1	79	33.8
No	11	61.1	14	41.2	26	59.1	24	42.9	11	20.0	9	33.3	95	40.6
None Available	6	33.3	16	47.0	8	18.2	11	19.6	14	25.4	5	18.6	60	26.0
Total	18		34		44		56		55		27		234	

TABLE 23

FARMER INDICATED SOURCES OF INNOVATION

ACCORDING TO TENURE

Source of Innovation	TENURE CLASS											
	Landlord		Owner-Operator		Share Cropping		Laborer-Operator		Employer Operator		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Lurah	3	16.7	7	6.5	2	22.2	2	6.1	2	3.0	16	6.8
PTD	5	27.8	27	25.0	2	22.2	15	45.5	14	20.9	63	26.8
AESPPL	4	22.2	19	17.6	3	33.3	2	6.1	12	17.9	40	17.0
Both PTD & SSL	4	22.2	41	38.0	2	22.2	9	27.3	30	44.8	86	36.0
Others	-	---	2	1.8	-	---	1	3.0	2	3.0	5	2.1
None	2	11.1	12	10.8	-	---	1	12.0	7	10.4	25	10.6
Total	18		108		9		33		33			