

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 <b>BIBLIOGRAPHIC INPUT SHEET</b>	<b>FOR AID USE ONLY</b>
---	-------------------------

1. SUBJECT CLASSIFICATION	A. PRIMARY <b>Economics</b>
	B. SECONDARY <b>Agricultural Economics</b>

2. TITLE AND SUBTITLE  
 Improving opportunities for low-income farm occupied people, some Indian experiences

3. AUTHOR(S)  
 Malone, C. C.

4. DOCUMENT DATE <b>1971</b>	5. NUMBER OF PAGES <b>37 p.</b>	6. ARC NUMBER <b>ARC</b>
---------------------------------	------------------------------------	-----------------------------

7. REFERENCE ORGANIZATION NAME AND ADDRESS  
 The Agricultural Development Council, Inc., 630 Fifth Avenue, New York, New York 10020

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publishers, Availability*)  
 (Presented at Seminar on Small Farmer Development Strategies, Columbus, Ohio, 1971)

9. ABSTRACT

The author delineates 15 agro-economic areas of India which include about 98 per cent of all Indian agricultural production. He discusses rainfall patterns, predominant crops, population densities, and crop values, number of farms in the agro-economic areas by size ranges, number of landless worker families, and other statistical measures. Next discussed is the Intensive Agricultural Development Program organized by the Indian government in 1960. Several considerations of the program designers are described: the replacement of limited Department of Agriculture practices by a carefully designed, integrated field program; development of a package of services to integrate production credit and technical inputs; widespread involvement of the villages and village farmers; and creation of incentives to encourage farmers to speed up production increases on their farms. Progress under the IADP approach was generally slow during the first five years, especially in rice yields, until 1966-67, when new, high-yielding varieties were introduced. Comparative statistics on increases in yields by farm size are presented and discussed. Among the author's conclusions: The most important contribution of the IADP is that it has been an effective means of encouraging farmers to raise their productivity. It has also helped develop professional staff at all levels. However, it is still more difficult for the small farmer than the larger farmer to obtain production credit, and difficult to get small farmers to gamble on new varieties developed at the research stations. What is needed is an extensive adaptive trial-research program to run parallel with the work at the research stations.

10. CONTROL NUMBER <b>PN-AAB-903</b>	11. PRICE OF DOCUMENT
---	-----------------------

12. DESCRIPTORS  Economic analysis Farms, small Income distribution	India Rural sociology	13. PROJECT NUMBER
		14. CONTRACT NUMBER <b>CSD-2813 GTS</b>
		15. TYPE OF DOCUMENT

CSD-2813 GTS  
PN AAB-703

SEMINAR ON SMALL FARMER DEVELOPMENT STRATEGIES

Improving Opportunities for Low-Income  
Farm-Occupied People:  
Some Indian Experiences

by

Carl C. Malone

The Agricultural Development Council and  
The Ohio State University  
Columbus, Ohio  
September 13-15, 1971

IMPROVING OPPORTUNITIES  
FOR LOW-INCOME FARM-OCCUPIED PEOPLE:  
SOME INDIAN EXPERIENCES

Background

A century ago, that part of the Indian sub-continent which now is the Indian Union already had a population near that of USA at present. Hence, the pressure of people on land resources was already relatively high. It appears from studies by Blyn<sup>1/</sup> and Sen<sup>2/</sup> that food grain production per capita then was considerably higher than it has been since. Even so, the great majority of Indians doubtless were very poor although likely somewhat better fed than in later years.

Although food was more plentiful, other things were unfavorable. It is well established that periodic drouths caused frequent famines in one part of the country or another. Mukherjee<sup>3/</sup> reports 18 famines between 1875 and 1900 with 26 million deaths. As the railway system was built, mostly between 1865 and 1915, internal movement of grain to stricken areas was possible for the first time and improvements in irrigation increased crop dependability as time went on. According to Sen, the notorious Bengal famine of 1943 was due to failure of government and transport, not to an over-all food shortage. The fact that no famine occurred during the recent widespread drouths of 1965-66 and 1966-67 testifies to the more productive Indian agriculture, the better organization of government and transport as well as to the substantial food assistance from outside. Incomes for the small farmers may or may not be higher now but farm families and others no longer are decimated by periodic famines.

Much more is known about agricultural production over the past century than is known in detail about the distribution of land holdings and the proportion of landless workers. When the Indians won their freedom, the big land holdings of the Zamindars and others were taken over and other land was re-distributed. But land and tenure reform did not proceed very far and has little similarity to that of Japan and Taiwan, for example, where the man-land ratio also was very high when land reform came about. It appears that India has had a large number of small farms over a long period of time but the really large farms have disappeared and tenure conditions have improved, gains that have helped some of the small men in agriculture. But the growing pressure of population on land and water resources continues and there is little hope that very many in the crowded rural areas will be able to find good job opportunities in the already crowded cities.

---

\*/ By Carl C. Malone - While the Seminar plans to deal with low-income farmers, separating small farmers and landless workers into discrete categories does not seem very meaningful to the author in the Indian situation: the paper is prepared accordingly.

Census reports show that the area now the Indian Union had about 210 million village people - mostly farm occupied - at the turn of the century compared with about 450 million now, still largely farm supported although a little less so than then. While additional tenure reform could well be of real merit, it would be no substitute for the need for a widespread and continuous increase in the productivity of farm-occupied workers, something that the government is more likely to do something about than it is to make important changes in land holdings.

Gain From Health Measures Offsets Agricultural Progress

Food supplies were at a low ebb at less than 14 ounces of food grains per capita per day and food prices were high when India became independent. As the 1st 5-Year Plan was formulated, population growth was estimated at about 1.2 percent per year. Since more land could be brought into production, the 1st Plan put heavy emphasis on land development and reclamation and expanded irrigation as well as improved crop technology and the beginnings of fertilizer manufacture. These were aimed both at more food and higher farm incomes. Since the government had little contact, then, with the villages where the farmers lived, another major move was to set up an organized system for working with village people, the Community Development-Extension system. Each District, which is a large governmental unit, was divided up into "Blocks" of about 100 villages each for developmental purposes. Each Block had an officer in charge, a few special workers, one in each of the more important fields, and 10 Village Level Workers (VLMs) each with 10 villages to work with the village people.

The 1st Plan move was successful. Food grain production rose by some 28 percent by 1955 largely due to 14 million more hectares of crops being harvested including 3 million more with irrigation. Some increase was due to better weather. The food supply rose to 15 to 16 ounces per day and prices receded. Villagers liked the new attention they received and some income gains were made which especially pleased the smaller farmers.

The 2nd Plan projected this favorable situation forward through the 3rd Plan and shifted the main emphasis to industry. But already the well organized malaria control program, aided by the United States AID program along with other health measures was having an impact. Population increases of 10, 24 and 26 millions were included in the first three Plans for which progress in agriculture seemed adequate. But when a population growth re-check was made, this showed increases of 37, 41 and 56 millions for the three Plan periods, a far different requirement.

As policy makers began to realize that the food situation was headed for serious trouble, the short 1957-58 crop intervened and made the shortage a reality. It was then that the government asked the Ford Foundation to make a special study of Indian agriculture which resulted in the "Food Crisis Report" <sup>4/</sup> which went to the government in April, 1959. This was followed in the fall of that year by the "Intensive Agricultural Development (District) Program" (IADP) prepared by a second Ford Foundation team with the help of the FF Representative and key Indians.

#### Agricultural Production Conditions

When the economic size of farm is of special concern, it is useful to know something about agricultural production conditions in different parts of the country. Officially, three different but not contiguous regions of different rainfall levels have been identified. One includes those areas with 1150 mm. (about 45 in.) of normal rainfall or more. Rice is the main crop at this rainfall level. A second region ranges from 750 to 1150 mm. of normal rainfall. While rice is grown with irrigation here, crops like wheat and maize are more important among the cereals and gram among the pulses. The third region has less than 750 mm. (about 30 in.) of rainfall and includes the large semi-desert farming area of Rajasthan and Gujarat. Jowar, bajra, groundnuts and cotton are the more important crops. The relative importance of crop land, irrigated land and 2nd crop in each area is shown in Table I, the three regions being generally similar in the net area cropped but not, of course, in value of crops produced. (See page 6)

Unlike USA where nearly all irrigated land is in the lower rainfall areas, irrigation is more widely distributed in India. Over one fourth is in the highest rainfall region. The proportion of crop land in 2nd crop provides an important clue to the extent and distribution of productive crop work during the year, an important matter since the lack of productive work on farms is one of the causes of low per-worker incomes.

Since it is well known that India is mostly a country of small farms, it might be supposed that the unirrigated part of the lower rainfall region is also the place that the most poverty on farms would be found. But such is not the case.

To get background for these and other matters, the author has delineated 15 agro-economic areas which include about 98 percent of all Indian agricultural production. These generally parallel the rainfall regions discussed above and are shown on the accompanying map. A summary of information related to these 15 areas after they have been re-combined into four appears in Table I.

The agricultural productivity level based on recent technology is best



Table I: Relation Of Crop Land To Rainfall, Irrigation  
And Other Factors

<u>A: Official Rainfall Regions</u>				<u>B-I: Agro-Economic Areas<sup>*/</sup></u>				
<u>Normal Rainfall</u>	<u>Net Cropped: Mil. Ha.</u>			<u>Areas</u>	<u>Normal Rainfall</u>	<u>Net Cropped: Mil. Ha.</u>		
	<u>Total</u>	<u>Irr.</u>	<u>2nd Crop</u>			<u>Total</u>	<u>Irr.</u>	<u>2nd Crop</u>
1150 mm & Up	41.7	7.1	8.2	6 Rice	1510 mm	51.4	13.8	7.7
750- 1150 mm	49.3	10.8	8.1	3 Wheat	864 "	32.1	7.6	12.9
Under 750 mm	47.1	8.7	4.8	5 Drier	832 "	42.8	5.5	1.0
<b>Total</b>	<u>138.1</u>	<u>26.6</u>	<u>21.1</u>	<u>1 Desert</u> <u>15 Total</u>	<u>284 "</u> <u>1060 "</u>	<u>8.8</u> <u>135.1</u>	<u>---</u> <u>26.9</u>	<u>---</u> <u>21.6</u>

B-II: Aspects Of Agro-Economic Areas<sup>\*\*/</sup>

<u>Areas</u>	<u>Rural Pop.</u>		<u>Ha. Rural Person</u>	<u>Value All Crops Mil.Rs.</u>	<u>Crop Value-Rs.</u>			<u>Index Of Crop Value</u>		
	<u>No. Mil.</u>	<u>% Farm</u>			<u>Per Ha.</u>	<u>Per Farm</u>	<u>Per Person</u>	<u>Ha.</u>	<u>Farm</u>	<u>Person</u>
6 Rice	211.4	76	0.24	40,651	790	1,460	192	134	90	91
3 Wheat	83.5	78	0.38	20,206	630	1,810	242	107	112	115
5 Drier	76.8	77	0.56	17,536	410	1,850	228	69	115	109
1 Desert	6.6	71	1.33	1,195	136	1,350	181	23	84	86
<b>Total/Av.</b>	<u>378.3</u>	<u>76</u>	<u>0.36</u>	<u>79,588</u>	<u>590</u>	<u>1,610</u>	<u>210</u>	<u>100</u>	<u>100</u>	<u>100</u>

<sup>\*</sup>/ Preliminary estimates by the author for 15 areas which account for about 98 percent of the all-India total. (See map for areas)

<sup>\*\*</sup>/ Based on 1963-65 crop production, prices and rural population and 1960-61 farm numbers from official estimates. Value of livestock production needs to be added - nationally this is estimated to add about 20% to the crop total omitting the value of work done by work animals.

identified as the gross value of crops per net hectare of crop land. This varies from Rs. 790 per hectare in the 6 rice areas as an average to Rs. 136 in the semi-desert with an over-all figure of Rs. 590. However, when put on the basis of rupees of crops per farm, all areas cluster around the average of Rs. 1,610. If we look further at the value of crop production in each area as related to the total number of village people in the same area, we find a reasonable degree of uniformity.

What this points out is that over past years, strong balancing forces have been at work keeping the rural population fairly closely related to the food supply of the area. This balancing force also seems to apply to the number of farms in each area so that crop output per average farm is relatively uniform. While this has applied in the past, it does not necessarily hold for the future. Other forces are now at work which are already bringing about differential rates of production increase on farms while still others may, in time, have a strong influence on the growth of smaller and medium sized towns and cities.

#### Location Of Farms By Size And Of Hired Farm Workers

Since the main interest here has to do with low-income farm-occupied people, the number of small farms in each area as well as the number of landless labor families is important. Information on this is of a lower order than that of population and production. The data available that fits in with the other information brought together has been used and is reported in Tables II and III.\*

As of 1961, it appears that there <sup>were</sup> about 23 million very small farms in India (46 percent of the total) with an average gross value of crops produced per farm of Rs. 363 as the 1963-65 average. Sixty percent of these farms are in the rice areas and another 21 percent in the wheat areas leaving about four million in the drier areas. To this number must be added the some 13 million landless worker families, again with 60 percent in the rice areas. Not all of these 36 million families fall into the low-income category by Indian standards but no doubt the largest share do. If we make a reasonable allowance for this, the remaining number is generally consistent with the 40 percent of rural Indians considered to be living in poverty in 1961 by Dandekar and Rath.<sup>5/</sup>

These researchers use a figure of Rs. 180 per capita available for consumer spending per year to draw the poverty line in rural areas in 1960-61. (This would be about Rs. 220 by 1963-65) If we assume a 5.0 member average family, this

---

\*/ The number of farms by size for the different areas is derived from data from the 10th Sample Survey for 1960-61 with a further adjustment for economic size using rainfed crop land from the next larger size as a guide. Since no official data on crop value per hectare by size of farm is available and evidence about crop value being higher or lower than average on small farms is conflicting, the per hectare crop values from Table I are used for all sizes. See pages 5 and 7.

Table II: Number of Farms In Agro-Economic Areas\*  
By Economic Size

and  
Number of Rural Landless Worker Families

<u>Economic</u> <u>Size</u>		<u>6 Rice</u>	<u>3 Wheat</u>	<u>5 Drier</u>	<u>Desert</u>	<u>Total</u>	<u>Percent</u>
Very :	No.(000)	13,800	4,700	3,890	200	22,590	46
	Small: Percent	60	21	17	2	100	
Small:	No.(000)	6,350	2,360	2,050	220	10,980	22
	Percent	58	21	19	2	100	
Medium:	No.(000)	4,650	2,010	1,800	220	8,680	18
	Percent	54	23	21	2	100	
Large:	No.(000)	3,007	2,078	1,706	247	7,038	14
	Percent	43	29	24	4	100	
Total:	No.(000)	27,807	11,148	9,446	887	49,288	100
	Percent	56	23	19	2	100	
Worker Families	No.(000)	7,770	1,760	3,425	50	13,005	
	Percent	60	14	26	-	100	

\*/ Derived from 1960-61 estimates of 16th Round of National Sample Survey and from the 1961 Census.

\*\*/Very Small: Equivalent to 1.0 ha. or less in rice areas. In others an addition was made from next larger group based on extent of non-irrigated land.

Small : Same as above but 1.0 to 2.0 ha.

Medium : Same as above but 2.0 to 4.0 ha.

Large : Same as above but 4.0 ha. and up.

\*\*\*/ Estimated from district Census data of rural hired farm workers. Farm workers from towns and cities are not included nor are plantation and livestock workers.

Table III: Average Area In Farm And Gross Crop Value\*  
By Economic Size In Agro-Economic Areas

<u>Economic</u> <u>Size</u>	<u>Per Farm</u>	<u>6 Rice</u>	<u>3 Wheat</u>	<u>5 Drier</u>	<u>Desert</u>	<u>Average</u>
Very :	Hectares	0.44	0.65	0.89	1.65	0.57
Small :	Crops, Rs.	348	410	365	225	363
Small :	Hectares	1.47	1.92	2.67	3.68	1.84
	Crops, Rs.	1,160	1,210	1,090	500	1,140
Medium:	Hectares	2.78	3.35	5.25	7.36	3.54
	Crops, Rs.	2,200	2,110	2,150	1,000	2,140
Large :	Hectares	7.68	8.54	14.30	24.40	10.20
	Crops, Rs.	6,070	5,380	5,860	3,320	5,760
Aver :	Hectares	1.85	2.88	4.53	9.90	2.74
	Crops, Rs.	1,460	1,810	1,850	1,350	1,610

\*/ Crop value per hectare based on Table I is used uniformly for farms of all sizes in the same agro-economic area.

brings the minimum income requirement per family to Rs. 900 per year in 1960-61 or Rs. 1100 at 1963-65 prices. This standard may be too demanding for rural India at this time but does provide a basis for comparison.

If gross crop value on very small farms averages Rs. 363 and we allow an additional 20 percent for livestock income (the national average) but with no deductions for rupee expenses which would be quite small, the average family on a very small farm would need labor or other income from outside of Rs. 665 per year to reach the Rs. 1100 minimum. Tenants who must share the crop with a landlord or those on farms below average in size or productivity would be in a poorer position. Those in better areas and the more capable managers would do better. In Tangore IADP, for example, a sample size-of-farm study conducted about this time showed an average gross on very small farms of about Rs. 1100 per year at 1963-65 prices.<sup>10/</sup>

The foregoing brings important features of Indian agriculture into clearer focus that are of concern to those interested in the low-income farm problem. We find that Indian agriculture is very diverse regionally with respect to natural resources and productivity but that rural people and farm numbers are in reasonable balance to this. But irrigation for raising crop yields and dependability is found about as much in the higher rainfall areas as the lower ones. Another point of importance is that except for privately owned tube wells, very few of the present irrigation systems permit modern water management on the part of the user.

The key "agricultural" problems appear to be almost universal over the country, especially the need to raise crop yields and productivity per hectare and per worker, whatever the causes back of them. Solutions for the low yields are beginning to appear but by no means uniformly crop by crop and area by area. If the concern is on too much poverty among farm-occupied people, this seems to prevail in nearly every village whether or not it is well or poorly watered and whatever the cropping pattern may be.

#### The Village Is Important

The organization of farming almost everywhere in India is consistent with the village situation. Villages are compact. Large, medium and small farmers, landless workers and others and their families live and work side by side using the limited supply of land, water, livestock and other resources. Every farmer produces and stores most of his own food as well as producing crops and occasionally livestock or products for sale. With village-wide development, the whole village becomes more aware of any failure to carefully and fully use all agricultural resources since the whole village as well as the individual incurs a loss.

A representative village has about 150 families of which about 100 are farm operators, 20 to 30 are landless workers and the remainder occupied at local services or other kinds of production. Such a village has from 160 to 400 hectares of crop land surrounding the village depending on its location in the country on which to apply their labor, managerial skill and capital that is used for farm production.

If the farms of a somewhat larger area are taken into account, one can think of the whole group as being distributed along a continuum from high to low or large to small based on the productive resource supply of each unit, especially the land and water. At each resource level, the farm operators involved are widely dispersed above and below the mean in terms of production and income, their individual level being determined by managerial ability, technical knowledge and competency of the farmer and workers, family incentives and the like. In the lower part of the continuum where the largest number of farms are concentrated due to their small size, the distinction between being a farmer and a hired worker diminishes both as to families and seasons, the choice being based on opportunity, family status and ambition. In some areas, many landless workers become seasonal cultivators, the farm owner being the cultivator during the main crop season with workers farming land on shares during the second season.

In view of this prevailing situation, local development and modernisation of agriculture, if effective, inherently tends to include community as well as individual and family aspects. This village situation can be an important asset in balanced development at the village level if properly organized.

#### The Intensive Agricultural Development Program

In 1960, the Indian government began to organize the Intensive Agricultural Development Program. This grew out of their concern for "food enough" rather than a concern about the low-income problem. Hence their measure of success for IADP was largely in short-run terms of how rapidly it was able to increase food grain output. Since much has already been written about IADP, it will be treated rather briefly here. 6/ 7/ 8/ 9/ 10/

The designers of IADP shared this concern for enough food but they felt that a better system of agricultural development, which would put the best available from science and technology to work, should be designed to assist all farmers, small as well as large and tenants as well as owners. Further, some provision

should be made to help landless workers become more productive and add to their income as a part of the process.

A brief review of several matters that the designers of IADP took into account may be useful.

First, IADP was designed to replace the method then being used to aid farmers by the Departments of Agriculture. This approach made use of agricultural "schemes", mostly consisting of single practices or that dealt with one crop such as the Japanese method of transplanting rice, village compost etc. Technical aspects were worked out and standard recommendations developed. The administrator set an accomplishment "target" for each area and field worker and arranged a budget or other needs. Little if any special training or field supervision was given to the PLWs who carried out the program in the villages. Follow-up consisted of checking performance against targets. This limited approach was replaced in IADP by a carefully designed, broad-based, integrated program worked out by district staff based on research and local conditions. At first, it was limited to the important crops farmers already were growing. For each crop and location, an economically sound and technically suitable "package of improved production practices" was worked out and organized into an effective field program. The field staff were carefully trained and actively supported. Simultaneously with the above, the district staff estimated needs of fertilizer, plant protection and production credit so that the full needs of farmers could be met.

Second, IADP developed a "package of services" to see to it that the production credit and technical inputs actually were available to all IADP participants making sure that these would be on hand on time and within reasonable distance of each farmer. In 1961 and for several years thereafter, most of these had to be requisitioned from the State or Center which required a considerable lead time.

Third, IADP recognized the inter-related nature of the Indian village and capitalized on this in carrying out IADP. The village as a whole was approached as well as individual farmers and both farm family and group gains were emphasized. Under favorable conditions, the enrollment of 60 to 80 percent of all village farmers in the first two or three years was not uncommon. When the new practices were not very profitable under prevailing prices and costs, this problem went back to the district technical staff for adjustment. When research was not adequate which frequently was the case, time was required to find a useful answer.

Fourth, IADP urged policy makers and administrators to see to it that the "economic climate" was such that farmers were encouraged to put forth a full effort to speed up production increase on their farms. It emphasized needs in price, credit and supply policy, irrigation policy and others. And the designers recommended a "public works program" for use in villages using local labor to undertake development works that would contribute to increased food production. This latter recommendation was not accepted and four years elapsed before the government worked out active steps to improve farm price policy. Credit policy remained weak and little was done about improving irrigation policy.

This whole operation within the district was placed in the hands of a carefully selected, competent agricultural officer, the District Project Officer, a new position in India. He was given a small technical staff; agronomist, plant protection specialist, farm management specialist, agricultural engineer and information officer to assist him. These, too, were new positions. To make it possible to have an intensive program, the number of field staff in the blocks was about doubled. The District Cooperative Officer, a man already in place, was assigned to the program.

The designers of IADP recognized that the government had other important agricultural programs under way in which IADP, itself, need not be directly involved. These included programs for expanding or improving the new Agricultural Universities and agricultural research which were being helped by US-AID and the Rockefeller Foundation. The 5-Year Plans called for substantial increases in major, medium and minor irrigation and in electrical power production, part of which would go to power tube wells. (Minor irrigation was included in district IADP programs where appropriate), As to new varieties, Rockefeller had a substantial program on hybrid maize and was assisting with wheat. But on rice, the main cereal, the Indians felt that they needed no outside help at that time.

IADP proposed that the above program be put to work in a large-scale, pilot demonstration program using the district as the development unit. If successful, it could then be extended to additional districts as rapidly as its minimum resource and other requirements could be met.

After a review of the situation, criteria were set up for guiding the states in the selection of suitable districts and the government moved to action in 1960, selecting seven states, each of which was to select its IADP district in consultation with the Center. Center and state then joined together in working out the numerous details involved in a new program including

planning and organizing the program. The Center provided most of the additional budget needed part of which was contributed by the Ford Foundation for the first five years.\*/ By the spring of 1961, most of the additional IADP staff had been selected and posted and the program was ready to move. However, within a year, pressure to participate from the other seven states was too strong to resist and 8 more IADP districts were chosen (Kerala got two). The initial 1960 area was large and much more so after the other districts were added. The 15-district total is shown below:

<u>Size of IADP</u>			
Districts	15	Cultivated land, Ha.	6,680,000
Blocks	314	Farmers	2,611,000
Villages	27,827	Family & Hired workers	7,440,000
Village people	22,923,000	IADP staff, Dist, Block, Vill.	8,300

Since much of the IADP idea and method was new, everyone from administrators and district project officers down had to become familiar with it and develop competency in putting it to use. Much of the first two years was required for this. By 1963-64, 16,842 villages were included in the program and about 863,000 farmers enrolled including a great many small and very small farmers and tenants as well as owners. Clearly, the Indian farmer was interested in improving his lot. Since the program offered no subsidies, this improvement had to come about through the farmer's own efforts assisted by the local staff. By 1966-67, the program had reached 24,336 villages and about 1,400,000 farmers.

The Ford Foundation provided ample funds for evaluation right from the start and a highly competent Expert Committee was appointed for this purpose. However, the data to be evaluated was entrusted mainly to the organization responsible for making crop yield and production estimates. This, with detailed practice information from the sampled fields, was the main data they gathered and this for only the major crops. While a sample of farms and villages was included, it was poorly carried out so most of the information on progress had to come from crop yield and related data which told little about important aspects of the development of farms, farmers and agricultural institutions under way.

IADP In Action

IADP , within a district, operates on a program year basis. As each program year draws to a close, the Project Officer begins to develop the program for the following year taking into account past experience and results, new opportunities and expected means to be available. The size of the next year's operation is set forth - crops to be covered, additional villages to be included, farmers to be reached, fertilizers of various kinds needed for the total program so the needed requisitions

\*/ The Ford Foundation also provided a 10-man team of advisors in various fields but they played strictly an advisory and not a decision making role.

can be forwarded to the state government in ample time, needs for seeds, plant protection materials and production credit estimated and the whole process set in motion/<sup>so</sup>these would be available when needed.

The district technical team together with research assistance revises and brings up to date all practice packages for the various crops under rainfall, irrigation and other local conditions. They decide on the kind, number and location of package or other field demonstrations on farmer's fields in view of past progress, farmer's needs and the practice or crop additions made. This is followed by careful training of all field staff so they can be effective in putting the program into operation and provide sound counsel to farmers. Part of the training is usually done at headquarters and part in the field.

In the earlier years, the enrollment of farmers in the program was a major field task. Publicity, village meetings and individual farmer contacts were made and village pride stimulated so the leaders would support full village coverage. The final enrollment of the farmer was for the VLW to assist him in the development of a simple farm (crop) plan setting forth the area to be covered, the practices to be used, the supplies and credit needed and the anticipated results. At first, these tended to be excessively detailed but later were made quite simple for use at this stage. The basic idea is for each VLW to help large numbers of farmers in each of his villages (usually five) move forward in using an improved package of practices to raise his yields and income (or packages if he has more than one important crop). This is thought to be more effective as a total farm development process than to work out more complete farm plans with a small number of progressive farmers. It is intended to help each village farmer move progressively ahead year by year from whatever his current practice and resource situation may be. As experience is gained, IADP then moves ahead with other aspects where suitable: more irrigation, better water management, an improved crop combination, multiple cropping, adding vegetables, poultry or dairying where feasible or others. These become a carefully planned part of the district program before they are put into the field. On a broader area basis within the district, better management or storage of technical supplies, improved marketing practices or outlets, more effective credit extension or others are added as analysis and experience indicate.

Most of these were in the public sector in 1960. Most farm product marketing was private and the sale of plant protection materials in some states. The credit-supply cooperatives were supposed to be moving to local management but, in fact, were heavily dependent on government support and guidance in most cases. Due to limitations of concept, policy and education about the economic-service role of viable farmer cooperatives, cooperative progress has been slow. As agricultural progress

has moved forward and the tonnage of technical supplies including fertilizer per village and per block has moved up sharply, there has been enough business for the private trade to move in and pay its way. Increasingly, this has been done although the rate varies from state to state. In IADP districts, this has greatly reduced the problem of making a pre-season estimate of fertilizer needs which was highly important in earlier years.

IADP Experience

The yield capabilities of the varieties available to IADP had been mis-judged - they had a modest response rate to fertilizer applications at best and most had a low yield ceiling. But since no new varieties of consequence became available during the first five years of IADP, it had to make use of what was at hand. Moreover, fertilizer-product price ratios were narrow during these years and income gains to participating farmers ranged from a moderate gain to none at all. Nevertheless more and more farmers made use of the improved practice packages for their crops. A recent study shows the extent to which IADP districts have been leading the way in fertilizer use in 11 states where IADP has been a continuous program.<sup>11/</sup> Progress with technical inputs is much easier to measure with precision than crop yields and output due to the large year-to-year influence of the monsoon on yields, especially where short-run yield changes have been small for the bulk of the crop acreage.

Table IV: Plant Food Used Per Gross Cropped Hectare

	IADP Districts			Rest Of Same States		
	1961/ 1962	1965/ 1966	1969/ 1970	1961/ 1962	1965/ 1966	1969/ 1970
Nitrogen, kgs.	4.61	12.55	20.35	1.47	4.03	11.07
Phosphoric acid, kgs.	1.91	3.36	7.80	0.46	0.88	1.51
Potash (K <sub>2</sub> O), kgs.	n	n	4.47	n	n	0.88
<b>Total</b>	<b>6.52</b>	<b>15.91</b>	<b>32.62</b>	<b>1.93</b>	<b>4.91</b>	<b>13.46</b>

n/ Not available but amount quite small.

In the IADP districts, plant food use has increased about 26 kilograms per hectare of all crops in eight years on the average and about 11 kilograms in the remainder of these states. While these results are not strictly comparable since the cropping pattern and proportion of irrigation may be somewhat different, there seems to be no doubt that IADP which works closely with farmers as individuals and in groups with respect to modernisation of their crop production gives better results than a generalized program of assistance as provided by the schemes.

As noted above, progress in yields and production was generally slow during the first five years, especially as to rice where yield gains from improved practices with the varieties then available was very small. With the arrival in the field in 1966-67 of the new, high-yielding varieties, the situation began to change rapidly where these varieties were well adapted. The new wheats did exceptionally well almost everywhere where irrigation was available but the new rice varieties proved to be extremely hard to manage successfully during the main (monsoon) rice season. They did much better in the dry season (winter and spring) but these account for less than 10 percent of the rice acreage (less than 5 percent in IADP districts). Tanjore, an important IADP rice district did benefit from an improved Indian variety which was adapted to about 40 percent of the 1st crop acreage even though it did not qualify as being high-yielding. Results for selected crops and districts, nearly all of these crops being irrigated, are shown below.

Table V: Total District Production of Selected Crops (000 metric tons)

<u>Year</u>	<u>Ludhiana</u>	<u>Shahabad</u>	<u>West Godavari</u>	<u>Tanjore</u>	<u>Shahabad &amp; Raipur</u>
	<u>Wheat</u>	<u>Wheat</u>	<u>2nd Crop Rice</u>	<u>1st Crop Rice</u>	<u>IrrRice</u>
1961-62	226	57	128	883	647
1965-66	341	95	152	787	646*
1968-69	721	222	217	1006	608

\* / 1964-65 used for Raipur as 1965-66 was a serious drouth year.

Here we see large differences in production increases of major crops under IADP conditions. From 1965-66 on, price incentives were high for all crops so this is not a differential factor. And improved technical practices were advancing in all districts. The main difference is in the availability of dependable, high-yielding varieties. While wheat in Ludhiana and Shahabad was making progress with the older varieties, it made a leap forward with the Mexican-based ones. Between 1961-62 and 1968-69, wheat acreage went up 69 percent and yields 89 percent in Ludhiana with gains of 100 percent in area and 93 percent in yield in Shahabad. West Godavari rice farmers are among the best in India but many of them suffered heavy losses as a result of their first experience with the new varieties which came in the monsoon season, hence they became very cautious as a result. But they soon learned that the new varieties did well with the 2nd (winter) crop and by 1968-69, a rapid shift in varieties was under way. None of the new rice varieties succeeded in Tanjore, a district almost wholly devoted to rice in the first season hence acreage of this crop cannot expand.

A new, improved Indian variety which suited part of the land moved production upward by a modest amount. All of the Shahabad and Raipur rice crop is raised during the monsoon. Farmers with staff assistance made extensive trials of the new varieties, mostly with little success although somewhat better in Shahabad where irrigation is more dependable where it is available. It is worthy of note that in Tanjore, the application of plant food to 1st crop rice went up from 11 to 42 kg./ha. during this period and on irrigated rice in Shahabad and Raipur reported above from 6 to 15 kg./ha. on the average, the irrigated area there remaining steady.

Indians who have worked closely with IADP over the years feel confident that it has greatly increased the technical knowledge and competence of farmers generally in these districts as compared to those not in IADP and has begun the process of making farmers managerially minded, even small farmers. As one District Collector (the senior administrative officer) put it, "IADP farmers no longer demand subsidies of me when I visit the villages, a common request of the past, but want to know how to obtain more of the means by which they can make progress on their own. And they are much more price and market oriented." Another gain has been in raising the competency of the staff who work with IADP. The district Project Officer and his staff have developed real skill in designing educational-action programs that center on key developmental needs of the area and, through continual training, have greatly up-graded the competency of the field staff. While little of the above can be documented from evaluation due to the shortcomings of the process in use, knowledgeable Indians are convinced of its validity.

#### IADP And The Small Farmer

IADP did not make distinctions among farmers by size or tenure in its approach since, basically, it planned to reach all farmers in the village who could be interested in what it had to offer. Not but that many people including some Americans at higher levels argued to the contrary saying that it should first work with the "progressive" farmers in order to be successful. But this idea was not adopted.

It would be going too far, however, to suggest that the smaller farmers have equal opportunity to participate compared <sup>with</sup> the medium and larger ones in any village-wide program. One reason is simply that of relative numbers. Typically one third or fewer of the farmers are in the medium and large category and cultivate two-thirds or more of the crop land. The VLW's superiors think mostly in accomplishment targets of hectares of crops on which the new practices have been applied.

Hence the VLW nearly always is under pressure to work more with farmers who have the larger acreages of the crop. Nor is it infrequent that village leaders and higher caste farmers, who usually have larger-than-average farms, require so much of the VLW's time for their own interests that there is little left for the smaller men. The greater difficulty of the small farmer in obtaining adequate production credit is well known, an important problem in IADP where the use of purchased inputs is on the increase.

In two districts, special conditions influenced participation by small farmers, one positive and one negative. Madras state (now Tamil Nadu) provided special credit to some of Tanjore's small farmers in the beginning years, an item of importance since this district has over 200,000 small and very small farmers, many of whom are tenants. This special program did not continue long, apparently because the state government did not feel that it was vital to the success of IADP after it got under way. In another district, in many places the large farm owners would not permit the staff to enroll any but full owners, the reason being that there were many tenants-at-will in an area where, according to the official records, there were no tenants at all. The landlords would not permit any kind of record to show that some of the small men were really cultivators and the farm plan, which each participant filled out, was a kind of record. These special situations, although important locally, were exceptions.

The extent of small farmer participation, so experience showed, was very much influenced by the way the District Project Officer organized and operated his program and the degree to which the District Collector gave active support to the full participation of all farmers in the village. Some Project Officers put much emphasis on this while others had more of the "progressive farmer" idea as the proper way to organize IADP.

#### Relative Progress of Smaller Farmers<sup>12/</sup>

The information collected from the random sample of crop-cut fields includes the size of farm from which the crop-cut was taken. This provides useful information about the main crop by size of farm. Data also is available about the cropping pattern by size and a few other items. Most IADP districts are uniform enough that cropping patterns are similar among farm sizes.

Yields of the main cereal crops and corresponding plant food use for 1968-69 from nine IADP districts were available to the author and are shown in Figures A and B which include all cases regardless of situation, variety or practices used.\*

\*/ The total number of farms from which fields are sampled are: very small, 670; small, 941; medium, 1,334; large 1,060; very large 774.

Fig. A: Paddy Yield And Fertilizer Use By Size Of Farm  
7 IADP Districts, 1968-69

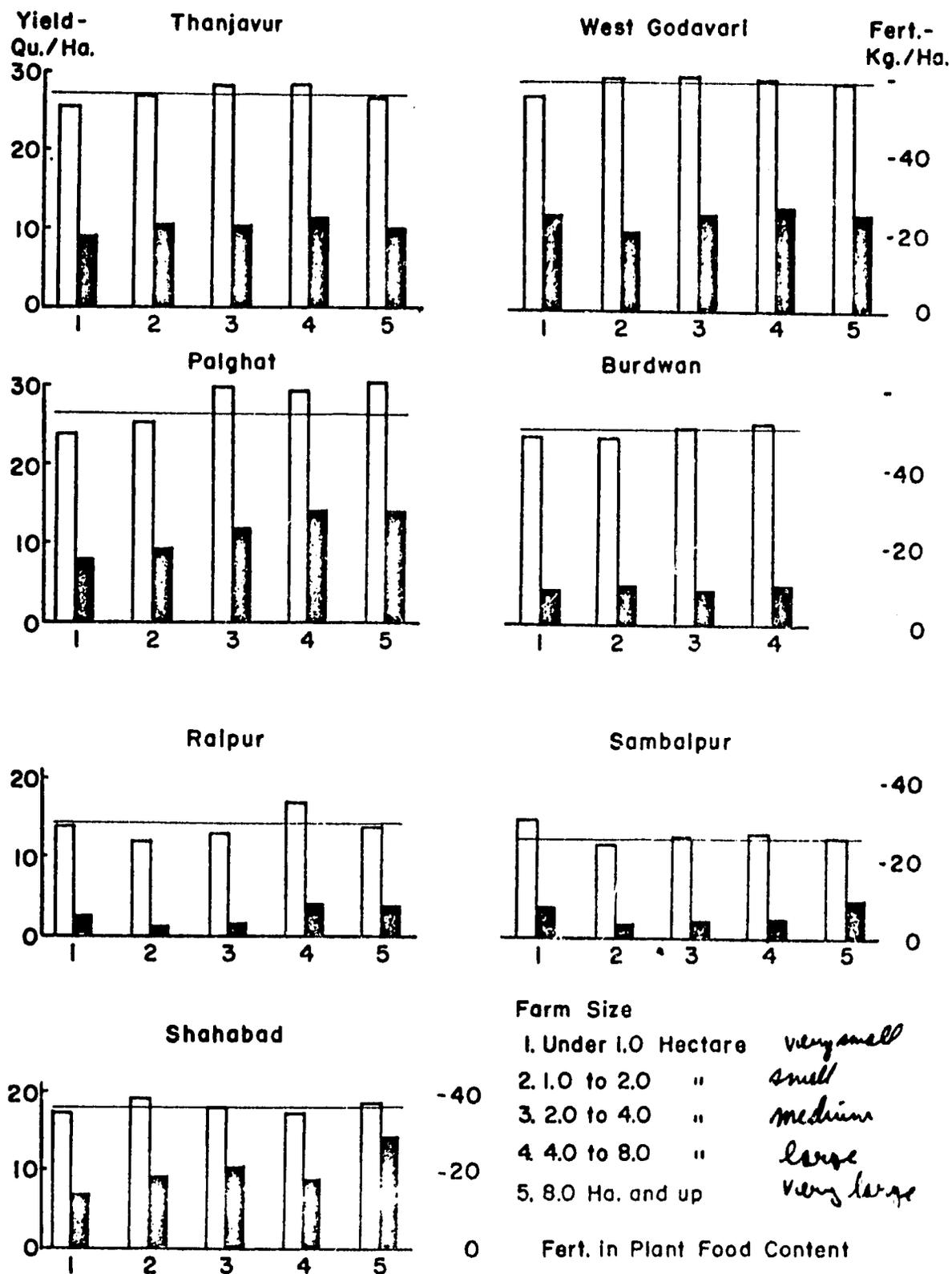
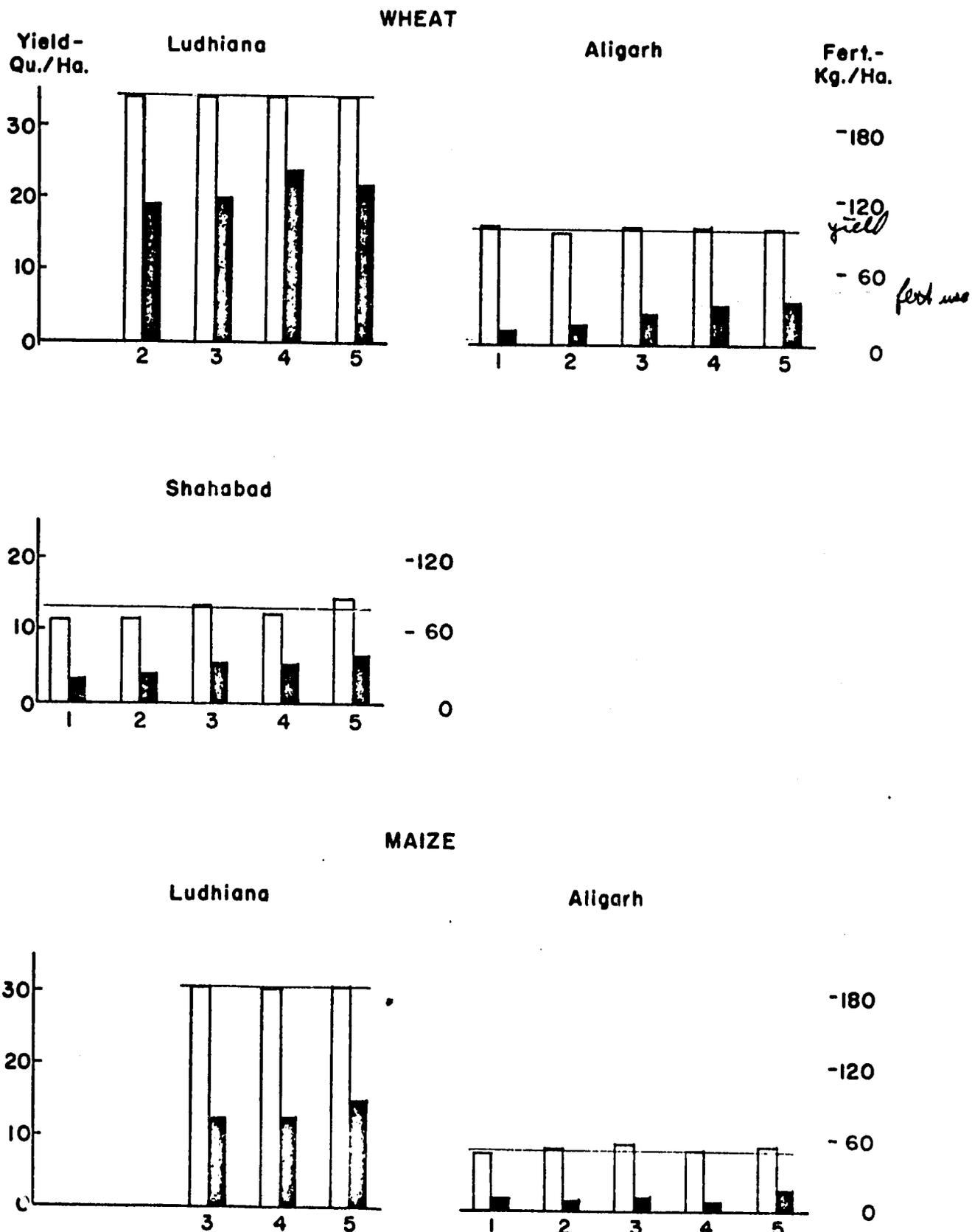


Fig. B; Yield And Fertilizer Use By Size Of Farm  
Wheat And Maize, IADP Districts: 1968-69



On the whole, the yield differences among sizes, if any, are quite small while, on the other hand, the expected tendency for medium and larger farmers to apply somewhat more fertilizer per hectare can be noted. But the pattern of increased fertilizer use by size is by no means uniform. In the case of only two districts and crops, Palghat rice and Shahabad wheat, does there seem to be a direct relationship between size and yield.

What this data should dispel is the idea that very small and small farmers are not participating in technological progress under IADP conditions. It has already been noted that they suffer certain disadvantages compared with medium and larger farmers. But clearly, many of the smaller farmers are able to overcome their handicaps.

The next question to be examined is the extent to which farmers on various sizes of farms are early participants in the use of the new, high-yielding varieties available in India. Information on this is reported below in Table VI.

Table VI: High-Yield Participation By Size of Farm

Farm Size	Number and Percentage of Crop-Cuts											
	Tanj. Kuruwai			W.G. 2nd Cr.			Shah. Wheat			Lud. Maize		
	All	ADT-27	%	All	IR-8	%	All	Hi-Yld	%	All	Hybrid	%
V.Small	61	48	79	59	8	14	12	6	50	--	--	--
Small	79	69	87	59	9	15	33	9	27	2	0	0
Medium	71	57	80	69	13	19	86	29	34	32	8	25
Large	37	30	81	61	24	39	76	29	38	120	33	28
<u>V.Large</u>	<u>30</u>	<u>22</u>	<u>73</u>	<u>52</u>	<u>18</u>	<u>35</u>	<u>61</u>	<u>27</u>	<u>44</u>	<u>133</u>	<u>38</u>	<u>29</u>
Tot./Av.	278	226	81	300	72	24	268	100	37	287	79	28

In Tanjore, IADP's intensive ADT-27 campaign succeeded in shifting most all growers to this variety irrespective of size, a little less with the very large farmers.

In West Godavari, the larger farmers have the biggest share of IR-8 in the 2nd crop season. This is an expensive variety to grow, the rupee outlay for practices alone running from 400 to 450 per hectare (\$ 50.00 to \$ 60.00) which is difficult for the smaller farmer to finance even though the yield promise is very good. Further, during this season, only medium and large farmers in the uplands are likely to have irrigation available at this time of year - one fourth of the IR-8 growers were in the uplands.

In Shahabad, very small as well as small farmers got in on the new Mexican-based wheats - a district not considered very progressive nor one where the smaller farmers have particularly good opportunities.

Ludhiana has very few small farmers, medium sized farms elsewhere being relatively small in this district. While hybrid maize has not been highly popular in this part of India due to a number of production problems, there is little difference in its adoption by size of farm.

Just as was found to be true with fertilizer use and improved practices in general, these data show that very small and small farmers are putting the new, high-yielding varieties to use in much the same way as medium and larger farmers. The very much higher rupee input outlay presents them with a considerable financing problem in many cases and no doubt holds many individuals back who would like to participate more.

#### Results Among And Within Size Groups

Another matter has to do with practice and yield progress among and within size groups when productive new technology is available. The normal rather wide distribution of yields above and below the mean among farmers has already been noted. Since the sample crop-cuts are not taken from the same fields and farms over time in IADP, an allowance must be made for this but it does not change the general pattern of the results that emerge.

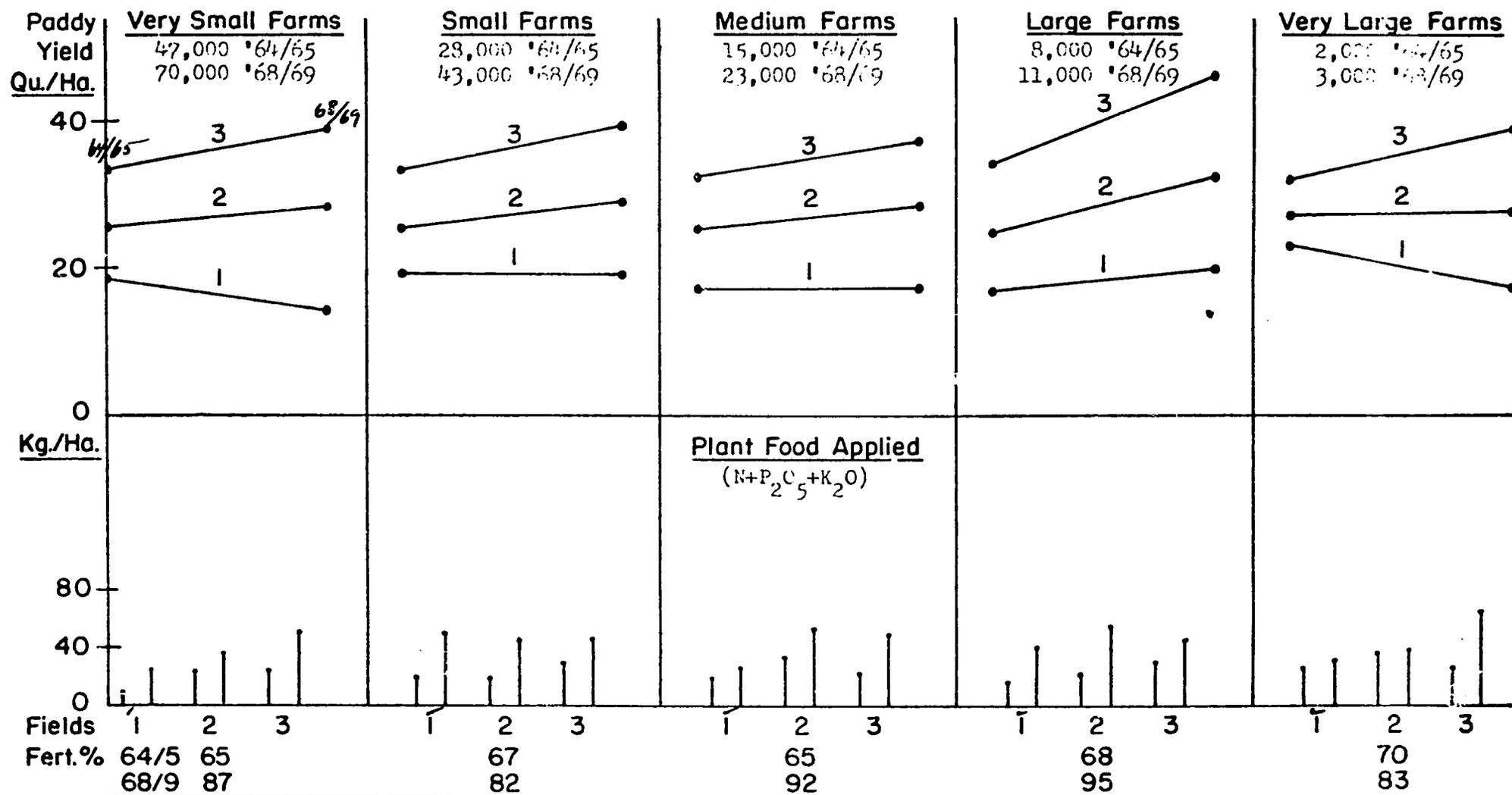
The data analyzed includes all cases for each year regardless of variety and practices used. The yields in each size group were divided into three further groups depending on yield level and the plant food use of the same groups calculated. Also, an estimate was made of the number of farmer-growers of each size for the crop being analyzed.

In Tanjore district, the analysis is for the early (Kuruvai) rice crop for which an improved variety - ADT-27 - was put into use in the field in 1966. By the 1968-69 crop year, 81 percent of the fields sampled were in this variety. Figure C shows the results. In interpreting them, account should be taken of the large increase in the number of growers of early crop, the likelihood that some was planted in fields not well suited to this crop and the fact that 1968-69 was not as good a year for early crop rice as was 1964-65 even though the whole crop is irrigated.

The plant food input per hectare best represents the effort made by farmers to do a good job. The proportion of farmers applying fertilizer is not greatly different by size in either year nor is the increase in users. It is interesting

Figure C: Tanjore Kuruvai (Early) Rice Crop  
(1964/65 and 1968/69)

Paddy Rice Yields



( 1, 2 and 3 refer to the average of the lowest, middle and highest third of the yields in each size group and the amount of fertilizer used in the same fields.

to note that the increase in application, which takes all growers and not just users into account, tends to be smaller on the very large farms, although the rate of application is somewhat less on the very small farms, many of which are operated by tenants.

The top one third in each size group got substantially higher yields in 1968-69 than in 1964-65, much of the credit being due to the use of the new variety. The middle group, also mostly users of the new variety, got somewhat better yields while the lowest one third did not make any yield progress even though they had made an advance in the use of fertilizer. How much of this poorer result is due the various possible causes, use of unsuitable fields, failure to use the better variety or the result of a poorer year, it is impossible to say. The large farmers (4.0 to 8.0 hectares) had the largest yield increase but since they did not use above-average amounts of fertilizer, the validity of their advantage seems doubtful.

In West Godavari, too, all rice growers and varieties are included. The results of the two rice crops shown in Figures D and E should be examined together since they are raised by essentially the same farmers. Much more irrigation water is available during the kharif season than in the winter which explains most of the difference in the number of growers. In the delta, the main rice area, irrigation water is supplied to all farmers during kharif and is rotated among them from year to year during the winter.

As was noted earlier, the new, high-yielding rice varieties are much more successful during the winter season than under monsoon conditions. The older varieties, too, gave a more profitable response to fertilizer in the winter. Over-all, Figure D gives a picture of yield progress when a much improved variety of a crop is available that requires a much larger and more expensive package of inputs for good results than the varieties it replaced and that calls for a substantial increase in grower skills. It is found that farmers on all sizes of farms are moving forward, both those with the older varieties and the new ones. Those using the new variety, typically on only part of their fields at first, are getting large increases in yields and income on the average. Here, the advancement in the rice crop is clearly under way on all sizes of farms with the better financed medium and larger farmers in the lead. If this was re-checked a year or two later, no doubt the spread of the new variety would have gone much further.

Figure D: West Godavari Rabi (Winter) Rice Crop  
Paddy Rice Yields and Fertilizer Use By Size of Farm  
 (1964/65 and 1968/69)

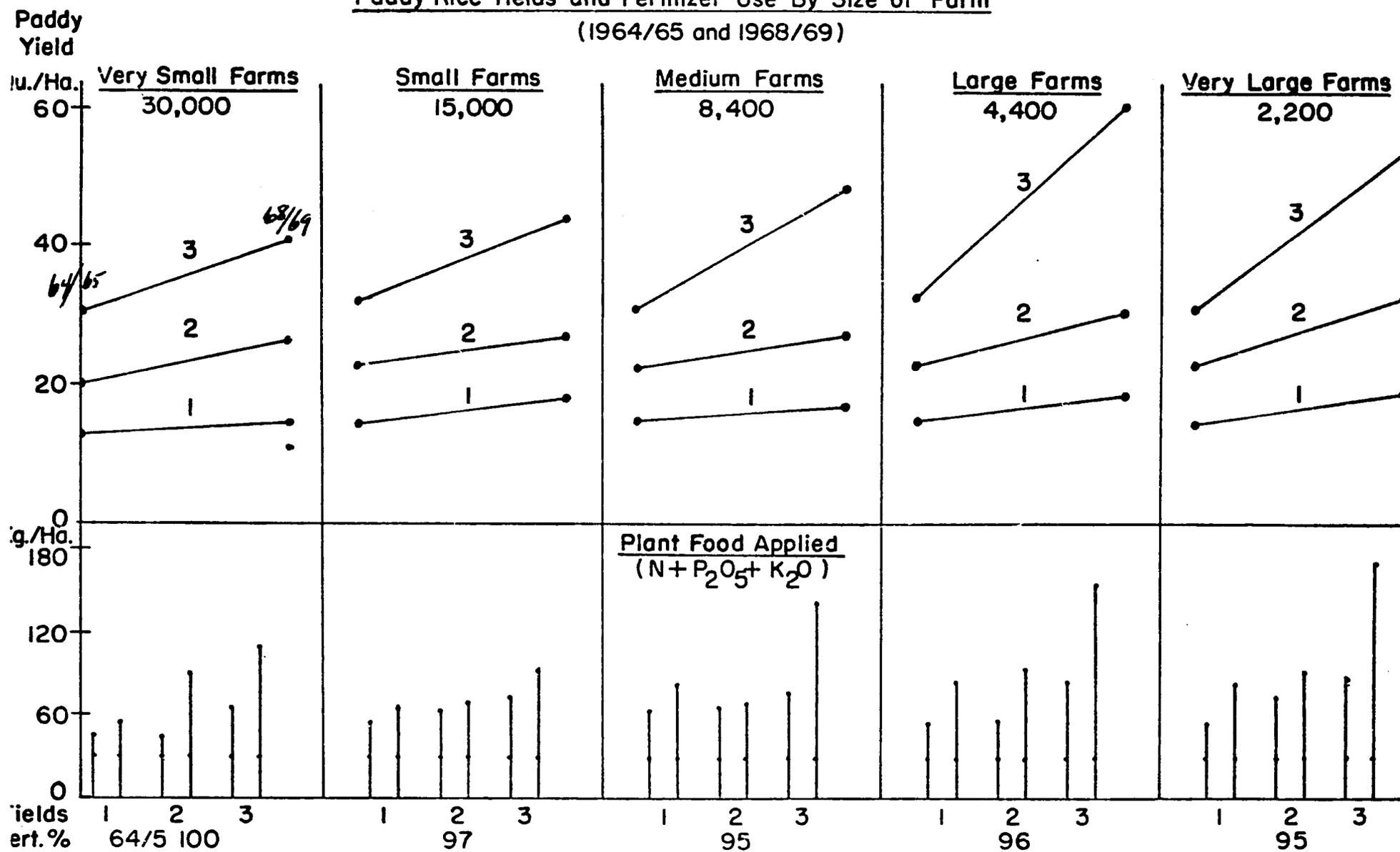
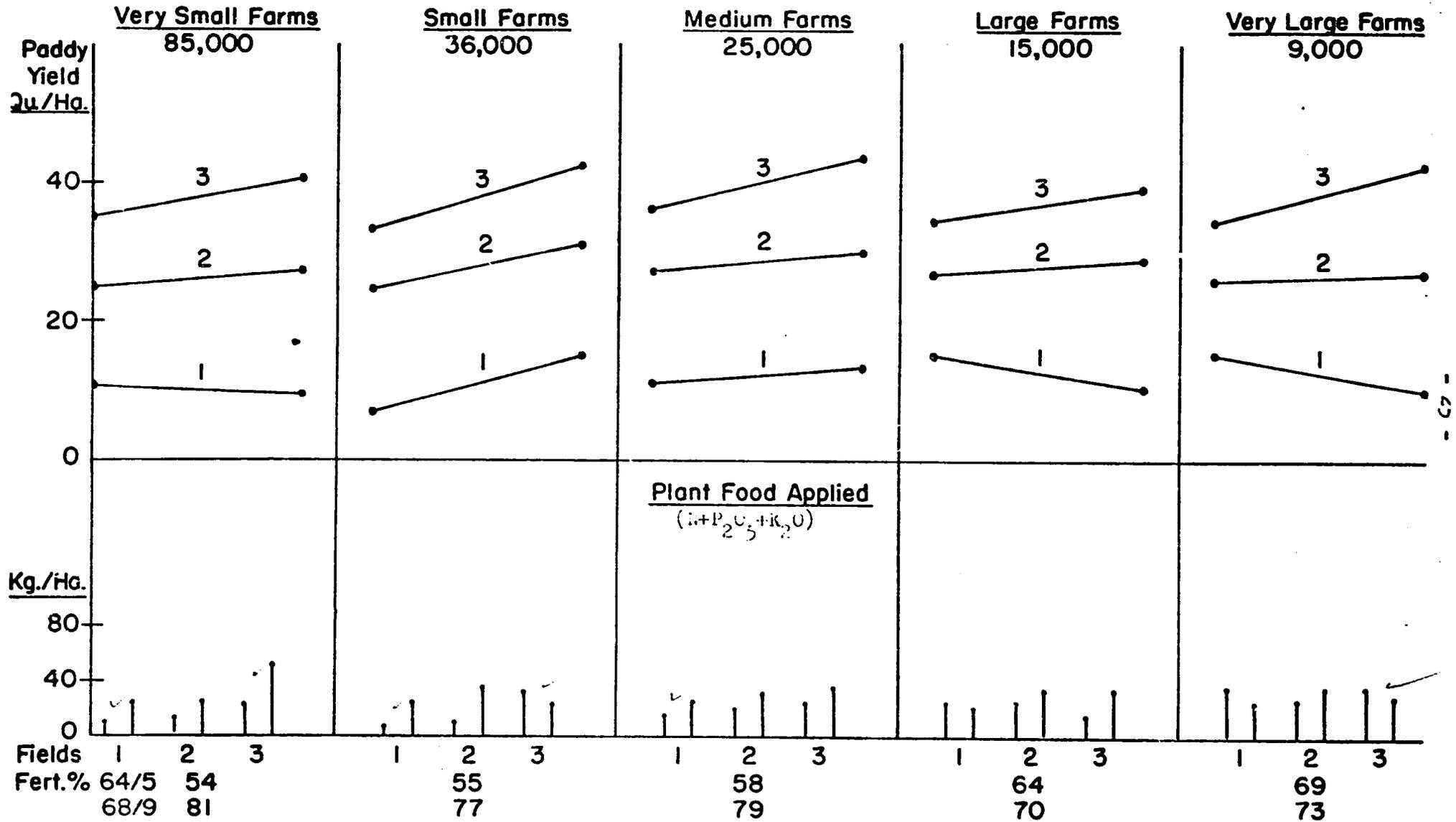


Figure E: West Godavari Main (Kharif) Rice Crop - Irr.  
 (1964/65 and 1968/69)  
Paddy Rice Yields



At the same time and on the same farms, farmers are making slow progress with the kharif crop as Figure E shows. This, even though during the past three years farmers have carried out hundreds of trials of the new varieties with staff help during the kharif season. The yield results have been both uneven and uncertain so the spread is very slow. The several thousand hectares of the new varieties grown during kharif in 1968-69 have not had a very large effect on average yields. As the fertilizer input per hectare for this crop shows, West Godavari farmers feel that they have about reached the economic ceiling with the older varieties. It may be that some of the newer varieties now being released will prove more successful.

In the progress made to date with this crop, it is interesting that the very small farmers appear to be in the lead, perhaps because they have time to give the crop more careful personal attention. In view of the small sample, however, careful study on the scene would be needed before conclusions could be reached.

Figure E, in fact, is much more representative of progress - or the lack of it - with rice for India as a whole than what is seen in Figures D or C. The results by size of farms appears to be generally representative, too, based on studies made in a number of other IADP districts not reported here.

#### Special Village Development Programs

A few IADP districts, especially Raipur which is considered rather backward, experimented with a few special village development programs.<sup>13/</sup> Since these seem to have unusual advantages for the smaller farmer, they merit attention. The general program for these villages which is part of the total district IADP program was especially prepared by the Project Officer and selected staff. They are carried out by regular IADP staff, the adjustment being that each village gets a full-time VLW who is specially selected, largely based on his past performance in IADP work. The villages themselves are also carefully selected but are required to be fairly typical villages so they can serve a village demonstration use if successful. The village leaders must request their inclusion as evidence of their interest and sincerity. Where the village is having internal problems among its people - some were - the village leaders must work out solutions acceptable to all before the village will be accepted.

The general program calls for fuller development of village leadership, especially of its younger leaders and those from smaller farms. This is mainly accomplished by the way the staff goes about its work with the village people

rather than undertake leadership development in a formal sense. Part of the process is to work with the village leaders in analyzing their situation and in planning a program suitable for their situation. At this stage, the heart of such a program is to have every farmer move forward in the use of the practice packages for his crops and at a progressively higher level year by year up to the economic level. Usually, new technology is available before this is fully accomplished.

Each village was encouraged to undertake a village development project of its own selection, making sure that it was one that they could carry out successfully with the means at their disposal. This might be improving or enlarging the village tank, putting to more productive use village owned land or something else. A key matter was that the village project was their own responsibility, IADP providing advice and guidance.

Most villages added a program for improving conditions in the village for their people such as a women's program, a program for the village youth or some other.

A few villages failed but most proved quite successful. Participation in IADP, especially of smaller farmers greatly increased and the practice packages were more fully used. These villages were among the first to try the new varieties. Economic success as well as successful village projects built up enthusiasm. The small people had a much larger part in village affairs. Some leaders went to higher authority to see if the idea could be further extended.

#### The Need For More Productive Farm Work Per Worker

In view of the lack of a sample of representative farms and farmers in IADP, several matters of importance with respect to low farm incomes cannot be studied directly and more generalized sources of information used where available. One question of importance is the availability of productive work per farm worker through the year which, of course, must be interpreted in view of the general level of economic and agricultural development.

One of the questions is that of how fully farmers are able to keep the land in productive use. Except in a few mountainous districts, winter temperatures are not a limiting factor but lack of water for a crop -or too much water- often is. Nationally, over 20 percent of the net cropped area is not occupied by a crop during the kharif (monsoon) season and about 60 percent during the winter. A consequence is the lack of productive employment whether of farmers, family workers or hired ones. This situation prevails in a number of IADP districts although the details have not been worked out.

More generalized estimates will high-light the situation. A preliminary estimate of labor requirements by crops and areas has been made by the author

and summarized by the agro-economic areas referred to earlier.\* Such data obviously are rather crude but help identify the existing situation. Using labor requirement standards based on farm management studies wherever available and estimates where they are not, the total labor needs by seasons for crops can be compared to the available labor supply based on the 1961 census. This is calculated as a male-equivalent counting each male worker as 1.0 and each female as 0.67, all agricultural workers being assumed to contribute physical crop labor. The results are as follows:

Table VII: Crop Work and Output Per Worker

<u>Area</u>	<u>Worker Days Used, All Crops</u>		<u>Gross Value of Crops Per</u>	
	<u>Kharif</u>	<u>Rabi</u>	<u>Worker-Day</u>	<u>Worker-Year</u>
6 Rice Areas	65	16	Rs. 8.23	Rs. 664
3 Wheat Areas	49	48	" 8.66	" 844
<u>5 Drier Areas</u>	<u>68</u>	<u>21</u>	<u>" 7.49</u>	<u>" 654</u>
15 Total/Aver.	63	24	Rs. 8.08	Rs. 701

While some time would be needed for livestock and maintenance work in addition to the work directly on crops, yet if all crops require only 87 days of productive work per worker per year on the average, the income per worker obviously cannot be very large. For 1963-65, the years used here, it works out as an average of Rs 8.08 per day (\$1.08) or Rs. 701 per year (\$93.50). The wheat areas with their more important rabi crops require more days of work per year with a somewhat above-average crop value per day. Out of this gross must be taken the various farming expenses and the remainder must be counted as the return not only for the labor input but also for land, capital and management.

The above shows only 30 percent of the workers time being required for all the crops on the average based on a 300 day work year. The high yielding varieties and other improved practices have increased the labor requirement per hectare since the above estimate was made. But the high-yielding cereals occupy less than 15 percent of the cereal acreage at present (less than 10 percent of all crops) while the farm labor force may have increased as much as 15 percent since 1961. In any case, the need for more productive farm work is of great importance.

\*/ Crop labor standards vary by location. Some averages in days per hectare used in the above calculations are: Rice, 102 days; wheat, 51; coarse grains, 42; pulses, 33; sugar cane, 204, cotton, 47. (See appendix Table VIII for more details)

### Generalizations and Conclusions

The most important contribution of IADP, perhaps, is that it is an effective means of encouraging and assisting farm people to raise their own productivity and that of the resources they work with from the prevailing low level to progressively higher levels. It helps them see the potential of better production and income opportunities for themselves and others and then provides specific information and assistance that leads to their realization. The fact that many farm people are illiterate or nearly so has not proven to be a major handicap to IADP. They understand farming and readily learn new ideas and methods if brought to them in a way that they can understand. Local observers report that IADP brings about a substantial change for the better in the way farm people see ~~themselves~~ and their production opportunities and in the way they use the various means required for progress.

The fact that IADP approaches the whole village as well as individual farmers is an important part of the process. This approach stimulates latent as well as present leadership and helps each one who tries to move ahead to do so in an effective manner. It helps them learn together how this can best be done. It stimulates group discussion of the various suggestions and recommendations being made, discussion in informal groups being a normal part of village life. IADP soon learned to stimulate and assist this further through the use of local farm radio programs that combine production information with local success stories and other means for encouraging progress.

IADP learned from the beginning to use a broad-based but specific approach that would interest the wide variety of people that make up any village. The practice package idea is one which farmers large or small quickly grasp and readily apply, especially when a package of services is simultaneously organized to back-stop the farmer's new input and credit needs. In applying the practice packages, ~~an~~ important part of the process was to avoid setting these up as fixed technical standards and then pressure every farmer to adopt them. That IADP adopted a

---

\*/ The reader should be aware that after the initial period, IADP never was pressed forward vigorously at higher governmental levels at the Center and this was reflected at the equivalent level in the states. The reason for this may be debatable. Some may say that it was almost inevitable in view of the way the system operates. In any case, it had a considerable restraining effect on IADP's rate of progress.

more flexible approach made it possible for everyone interested to participate to the degree he saw fit, the idea being that everyone could move forward to some degree to higher levels of production and income based on his own situation as to farm size, tenure, resources, skills and other factors.

This degree of program flexibility was made possible by putting the key program decisions into the hands of the District Project Officer who is developmentally oriented by nature of his responsibility although usually not by his training. If production technologists make these decisions, they are inclined to set the standards at research levels and push for full use of the package by all farmers. IADP discusses the composition of the recommended packages and their merits with farmers but asks each man to move ahead based on his own best judgment. The important matter urged on each one is that he undertake progressive change for his own benefit, not that he should immediately adopt the recommendation as it comes from higher-up. The simple farm plan is one of the tools used to initiate production progress, not primarily as an instrument for reaching an economic optimum but one for helping the farmer with his forward progress.

This flexibility is especially important in encouraging smaller farmers and tenants to join in the progressive forward movement that IADP emphasizes in the village. It helps each one feel that he can be a full-fledged member of farming progress in the village based on the forward steps he feels that he can take. This is important in getting wide-spread and enthusiastic village support.

An aspect related to the above is that IADP has proved to be highly developmental of the professional staff at all levels. Where the program was carefully planned and staff training effectively carried out, the competency of the staff improved markedly. In just a few years, as professional workers many of them stood head-and-shoulders above those in similar positions elsewhere. Unfortunately, the government made little response to this improvement in its promotion policies which tended to dampen the response.

The fact that IADP is energetic in working to assure and improve the production input side, especially that of credit and technical supplies, simultaneously with the practice packages and provide other help to farmers is also vital. IADP provides good evidence that a combined "educational-action" program is vital to local agricultural development and production progress, at least under Indian conditions. Many excellent local educational programs dealing with agricultural production have been carried out on a small scale by various groups. But none have flourished partly because they lacked the essential ingredient of input support.

However it should be said that neither in policy nor operations was the input support side of IADP up to the level of that of agricultural technology.

For reasons of brevity, little has been said in this paper of the importance of <sup>the</sup> higher level leadership and assistance provided out of the newly established IADP Center office. The IADP Project Director who headed this office not only was highly competent but strongly field oriented. Without his persuasive and energetic leadership and assistance to the districts, there is doubt as to whether or not IADP could have gotten successfully under way. He also served an important purpose in the advice and counsel he provided the policy makers and administrators above him. (This office has now largely been terminated).

He had a small specialist staff assigned to IADP but they had difficulty in finding an effective role in an IADP type of operation where each state is in full charge of its own district. Some of them developed considerable proficiency over time in their new role which was, in their own technical field, to complement the work of the Project Director as he worked to encourage, strengthen and assist the states and districts with their new IADP work.

A weakness that still continues was that no state learned to function really effectively in providing leadership and assistance to its IADP district which has been an important reason for the slow spread of the use of the IADP process and method. The Indian administrator is thoroughly trained and highly skilled in the usual means used for local agricultural development: the issuance of directives setting up the planned schemes based on the recommendations of technical advisors; the setting of accomplishment targets; the planning of budgets out of very limited means for their support; the use of administrative authority to press for results. Very few understood how to provide the leadership support and assistance needed by the IADP effort nor how to train and supervise their own professional staff at the state level for the task at hand. The tendency was to fall back on the the directives with which they were familiar but which have little if any place when an IADP type of program is available in the field.

#### Improving The Technical Base

India is at the beginning of the stage of crop development which prevails in more advanced countries - a great profusion of new varieties is beginning to pour forth from research stations. These have centered on wheat, rice and some other cereals so far but the list is being extended.

That the new varieties fit some farm conditions quite well but not others based on IADP experience has been reported earlier. Where they do not - and this has been the more common situation - a serious gap has developed between crop research work and profitable yield increases on farms. This problem is especially acute for smaller farmers who cannot take a chance on a new variety, however promising, whose yield performance cannot be trusted in their own fields.

What is needed is an extensive adaptive trial-research program to run parallel with the new variety work at the research stations to fill this gap. As yet, this has not gone far in India. But it will be a necessity if the smaller farmer is to have an equal opportunity with the larger one to make use of the results of modern crop and other research.

#### Helping Smaller Farmers

As to small farmers themselves, their basic need in increasing production and income is essentially the same as for those who operate more land. This accepts what seems to be a fact that small Indian farms will not become larger in land area in the future and improvements that will increase their economic size will have to come about in other ways.

Since one need is to raise the productive capacity of the farmer, himself, and the IADP method has proven effective along these lines, there is every reason why it should be improved and extended rather than replaced. The more intensive process used in Raipur district in the special villages merits more extensive trial on a wider basis since it is especially effective in reaching all village farmers and in helping the smaller farmers move forward. It also considerably increased the amount of work available to landless workers. It has had useful social effects as reflected in the statement by a village leader that "The small farmer has become our equal as he reaps as much per acre at harvest as we do". In another case, a village Harijan served as program chairman when an important outside official was being entertained and a local farm woman appeared on the program.

There seems to be no valid reason for failing to extend the IADP type of program to large numbers of districts with the goal of reaching all of them before many years since it is clearly superior to the alternate scheme approach. Recruiting capable staff for a considerable expansion should not be a major problem since many capable agricultural officers are now assigned to low priority work. Shifting them would not add to budget costs. Other needs would add to district budgets, it is true, but this is not likely a compelling restraint.

A more significant problem is in the re-thinking, re-structuring and re-organizing needed in the Center and state Departments of Agriculture and related agencies. These simply are not geared to the IADP type of district agricultural development where the main program decisions must be assigned to the district and the state office provide leadership, assistance and support as well as policy, budget and general administration. Within the district, Agriculture, Animal Husbandry and Horticulture should be integrated into a single program under the Project Officer. To this, there is strong resistance at higher levels. There is much resistance, too, from agricultural technical officers at higher levels who feel that IADP if extended would reduce their area of responsibility and opportunity. That this is a mistaken idea does not change the situation.

#### Institutions and the Small Farmer

The IADP approach is having good success in working with small as well as larger farmers but it also is finding that solutions on the institutional side are proving much more difficult. Adequate production credit for small farmers, if made available to all, is especially complicated. Small farm loans will always be expensive to service and the number of such loans needed in proportion to larger ones if all small farmers are to be covered creates many problems for the lender whether a bank, credit cooperative or the state, itself. Moreover, they carry a higher risk for the lender by nature of the case, the smaller man having a less dependable market surplus above family needs on a year to year basis since much of the reason for these variations is outside of the farmer's control. It is true that the systems used in Japan and Taiwan have succeeded quite well but these came at <sup>a</sup> more advanced state of development than now prevails in India. In principle, local credit cooperatives have the best chance of working out reasonable solutions. In India, however, this would require important changes in ideology, policy, leadership, organization and operation and such a group of changes is difficult to bring about simultaneously. IADP hoped that it could experiment with an improved system, at least in one district, but the necessary support at higher levels was never forthcoming.

Water distribution and management to provide equal opportunity to small as well as larger farmers often is another problem. Farmers prefer private tubewells where these are suitable. Small farmers cannot afford one of their own. While in some areas, the larger farmers sell water to the smaller ones on

a satisfactory basis where water is abundant, this is more difficult to work out where the water supply diminishes in drier years which results in the smaller farmers who buy water taking up all of the slack. In drier areas where contour farming on larger areas is required, the needed cooperation may be difficult to arrange. In areas requiring large drainage projects to protect from monsoon floods, IADP found that the needed authority for building drainage channels within the village did not exist on a practical basis. In these conditions, the smaller farmers nearly always find themselves at a disadvantage since they are unable to carry equal weight in decision making with larger farmers.

Now that private firms are moving into the agricultural supply business as well as cooperatives and competition for the farmer's business is growing, the smaller farmer has little difficulty in obtaining these inputs on time if he can finance them. He has more difficulty on the marketing side as he is more at the mercy of the traders and others with the small quantities he has to sell. IADP has just begun to try to deal with some of these kinds of problems so does not have much successful experience to offer as yet.

The very small farmers who are part-time farmers and part-time workers have additional problems. Except in the Raipur villages discussed above, IADP has given these small people little attention. Partly this has been due to the heavy work load that comes from trying to serve the needs of the full-time farmers. But more specifically, it comes from the fact that policy makers and administrators have felt little concern for these people with respect to the IADP organization. There is limited but quite convincing evidence noted by close observers that the IADP staff could have a much larger impact both locally and at higher levels if it conceived itself and its program to have a broader-based responsibility in rural as well as agricultural development. But the implications of this neither as to objectives or to methods and operations has yet been spelled out to see what might be feasible as well as useful. There is still some distance to go in India in getting acceptance, at the decision making levels, for extending more broadly the benefits of the IADP idea and method in helping the recognized farmers, small, medium and large, in many more districts. Recent reports suggest that this may now be beginning to get under way.

Appendix - Table VIII: Some Basic Data From 15 Agro-Economic Areas

Area	1971 Pop. <sup>1/</sup> Millions		% Rural People <sup>2/</sup>			Rain mm.	Net Crop Land - Ha.			% Farm Workers <sup>2/</sup>				Ha. Crops <sup>4/</sup> Per Worker		Rs. Crops/ <sup>5/</sup> Worker	
	Urban	Rural	Tri- bal	Har- ijan	Caste- Other		Tot. Mil.	% Irr.	Rural/ Person	Per Farm	Male	Fem.	Fam.	Hired	Khar.		Rabi
<b>Rice Areas</b>																	
I: N.Rice-Wht	8.8	87.7	6	17	77	1200	16.1	30	.18	1.62	65	35	74	26	.55	.37	487
II: E.Rice-N.	7.5	48.3	7	21	72	1590	8.9	27	.18	1.65	79	21	72	28	.90	.19	868
III: Assam Rice-Tea	1.8	16.3	20	7	73	2560	2.9	26	.18	1.81	67	33	95	5	.73	.12	647
IV: E.Cent.Rice	2.6	28.8	33	12	55	1420	10.9	16	.38	2.84	55	45	77	23	.99	.35	561
V: E.Rice-S.	8.4	31.9	2	20	78	1000	7.2	48	.23	2.06	61	39	60	40	.74	.25	845
VI: W.Rice Ker. North	3.6	18.1	8	8	84	2580	2.1	13	.12	.97	58	42	70	30	.76	.27	913
	3.9	15.3					3.4			2.30							
6 Rice Areas	36.6	246.4	10	15	75	1510	51.4	27	.21	1.85	64	36	73	27	.74	.29	664
<b>Wheat Areas</b>																	
II: N.W.Wheat	9.1	35.0	0	22	78	770	10.6	44	.30	3.30	83	17	87	13	.94	1.34	1284
III: N.C.Wheat-N.	8.9	38.8	2	24	74	840	11.4	19	.29	2.12	80	20	91	9	.88	.97	771
IX: N.C.Wheat-S.	6.3	23.6	17	15	68	990	10.1	9	.43	3.95	56	44	82	18	.94	.81	538
3 Wheat Areas	24.3	97.4	5	21	74	864	32.1	24	.33	2.88	73	27	87	13	.92	1.03	844
<b>Drier Areas</b>																	
X: Gujarat Cotton	4.0	8.9	12	8	80	810	4.0	9	.45	4.93	66	34	76	24	1.73	.25	893
I: Deccan Cotton	5.6	22.0	6	8	86	780	15.4	5	.70	7.46	55	45	57	43	1.63	.56	645
I: Drier South	7.6	22.4	1	18	81	800	6.2	27	.28	2.22	61	39	78	22	.87	.12	635
I: Drier S.Centr.	3.4	15.0	3	18	79	940	4.6	20	.31	1.64	54	46	62	38	.91	.51	557
V: Drier C.West	6.4	21.1	12	8	80	780	12.6	14	.60	5.86	54	46	77	23	1.35	.64	729
5 Drier Areas	27.0	89.4	6	12	82	832	42.8	13	.48	4.53	57	43	69	31	1.27	.44	654
V: N.W.Desert	1.7	7.7	3	15	82	284	8.8	--	1.14	9.90	59	41	96	4	2.60	.47	526
1 India	108.8	451.2	8	16	76	1060	136.8	20	.30	2.75	64	36	76	24	.94	.49	701

Estimated from official data; 4 main cities are not included with their areas.

From 1961 population report: Harijans are scheduled castes, traditionally being assigned menial tasks.

Based on 1971 rural population.

From 1963-65 crops which occupy land in kharif and rabi seasons using 1961 workers on a man-equivalent basis including an allowance for farm workers from urban areas. Omits plantation workers and crops.

1963-65 production and prices and workers as noted above; omits plantation crops.

References

- (1) Blyn, George. Agricultural Trends in India, 1891-1947: Output, Availability and Productivity, Univ. of Penn. Press, Phila., 1966
- (2) Sen, S.R. Growth and Instability in Indian Agriculture, Indian Society of Agricultural Statistics, New Delhi, 1967
- (3) Mukerjee, Radhakamal. Food Planning for Four Hundred Million, Macmillan & Co., London, 1938
- (4) Government of India. Report on India's Food Crisis and Steps to Meet It, Agricultural Production Team sponsored by The Ford Foundation, Ministry of Food, Agr., C.D. and Cooperation, New Delhi, 1959
- (5) Dandekar, V.M. and Rath, Nilakantha. Poverty in India, Economic and Political Weekly, Bombay, 1971
- (6) Brown, D.D. Agricultural Development in India's Districts, Harvard Univ. Press, Cambridge, 1961
- (7) Ensminger, Douglas. Obstacles to Economic Development in Less Developed Countries, JFE, Vol. 44, 1377-1382, Dec. 1962
- (8) Government of India:
  - a. IADP, Second Report (1960-65), 1966
  - b. IADP, Fourth Report (1960-68), Volume I, Modernising Indian Agriculture, 1969; Vol. II, (District Chapters), 1970; Expert Committee on Assessment and Evaluation, Ministry of Food, Agr., C.D. and Cooperation, New Delhi
- (9) Malone, Carl C. and Johnson, Sherman E. The Intensive Agricultural Development Program in India, Agricultural Economics Research, USDA, Vol. 23 25-35, April 1971
- (10) Malone, Carl C. Some Responses of Rice Farmers to the Package Program in Tanjore District, India, JFE, Vol. 47, 256-269, May, 1965
- (11) Shastry, B.D. IADP as Pace Setter for Increasing Fertilizer Use in India, Farm Economics Digest, Vol. 3, New Delhi, March, 1971
- (12) Malone, Carl C. Progress in Modernisation of Rice, Wheat and Maize Production in IADP, The Ford Foundation, India Office, New Delhi, 1971
- (13) Shastry, B.D. Quickening the Pace in Village Improvement, Ministry of Food, Agr., C.D. and Cooperation, New Delhi, 1969