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**THE CONSEQUENCES OF SMALL RICE FARM MECHANIZATION PROJECT**

**Working Paper No. 56**

**A DESCRIPTIVE STUDY OF FARM HOUSEHOLDS IN 8 VILLAGES IN  
NUEVA ECIIJA, PHILIPPINES**

**Presentacion Moran  
The International Rice Research Institute**

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## INTRODUCTION

This study draws primarily on the results of a household census conducted in March-April 1979 in 8 villages in Cabanatuan City and Guimba in Nueva Ecija province. The purpose was to identify the farm operators and landless laborers in each village for subsequent sampling for the Consequences of Farm Mechanization Project. Data collected in the census included primary occupation of the household head, number and size of parcels operated, type of irrigation and type and number of farm machines used and owned. Since the villages were relatively small, 125-410 households, all households in the village were enumerated.

### Occupational distribution

Table 1 shows that in 1979 the majority of household heads were farmers. The highest percentage of farm households was in San Andres (87%), followed by Narvacan and Galvan with approximately 81%. The share of the landless laborers varied in each village from 5-18%, with most villages having more than 15%. The percentage of non-agricultural workers was significantly higher in the villages in Cabanatuan City than in Guimba (12-46% vs. 2-12%). In fact, the number of non-agricultural workers in the villages in Cabanatuan City was generally higher than the number of landless laborers. The opposite was true for the villages in Guimba. This may be explained by the proximity of the villages to the city proper, where a variety of non-farm employment opportunities are available.

Taking the villages together, farm households accounted for about 62% of the population, landless laborers for 14% and non-agricultural workers for 24%.

### Farm number and area

The census covered a total of approximately 2,144 ha., representing 1,042 farms and 1,310 parcels (Table 2). Of this area, about 94% (2,007 ha.) was devoted to rice. The overall farm holding was 2.06 ha., average rice farm size was 1.93 ha. while the average number of parcels per farm was 1.26.

Bunol accounted for the more than 19% of the number of farms, parcels, total farm area and rice farm area. Kalikid Sur and Caalibangbangan followed, each with about 17% of the farm area and 15% and 17%, respectively of the rice area. At the tail was Narvacan I, having only about 6% of the area and 7% of the farms and parcels. On a farm basis, Kalikid Sur accounted for the highest average farm holding with 2.71 ha./farm. San Isidro and Bunol followed with an average farm size of 2.35 ha. and 2.12 ha. respectively. The average farm size in the rest of the villages ranged from 1.81 - 1.98 ha. With respect to rice farm, the average holding in all except 2 villages was about 2.0 ha.

### Distribution of farm area by level of irrigation

Table 3 shows the distribution of farm area by water regime. In 1979, about 46% of the farms in the 8 sample villages were rainfed, 41% were irrigated double-cropped, 11% were irrigated single-cropped and 2% were irrigated triple-cropped. By village, Kalikid Sur, Galvan and San Andres were predominantly rainfed, with about 91% of their farm area having no irrigation system. On the other hand less than 2% of the farms in San Isidro, Lagare and Caalibangbangan were rainfed; the majority (65-80%) were irrigated and double cropped.

### Farm size distribution

Except in San Isidro, Caalibangbangan and Bunol, the most frequent farm size category in every village was 1.01-2.00 ha. (Table 4). These farms represented 32-46% of the total number and 21-43% of the total area. In contrast, 28-37% of the farms in San Isidro, Caalibangbangan and Bunol were between 2.01 and 3.00 ha. The area they accounted for ranged from 36-46% of the total.

Farms between 0.51 and 1.00 ha. were also relatively important, accounting for 16-26% of the total number and 7-14% of the total area. Farms smaller than 0.51 ha. constituted less than 15% of the total number and less than 4% of the total area; farms ranging from 3.01-10.00 ha. were less than 25% of the total number, although the area covered represented almost 40%. Finally, only San Isidro, Kalikid Sur and Bunol had farms exceeding 10.00 ha., but these represented less than 3% of the total number and 14% of the total area. The Gini coefficient ranged from 0.54-0.62. Galvan accounted for the highest value, implying the most equitable distribution; in contrast Bunol had the lowest coefficient, indicating the most inequitable distribution of farm sizes in 1979.

### Inventory and use of farm power sources

In 1979, sources of farm power in the 8 sample villages included 770 carabaos, 101 2-wheel tractors, 8 4-wheel tractors, 8 threshers, 6 rice mills and 103 irrigation pumps (Table 5). Relating to the total farm area, the computed ratio ranged from 2.78 ha. per carabao to 357.39 ha. per rice mill. By village, the rainfed villages generally accounted for the higher shares of carabao whereas the gravity-irrigated villages took up the majority of the tractors. Irrigation pumps were concentrated in Bunol (35%), Narvacan (26%) and San Andres (19%). This explains the fact why relative to the other rainfed villages, these three villages had larger proportion of irrigated double-cropped land.

Villages could be classified into 3 levels of mechanization, highly mechanized, moderately mechanized and non-mechanized, based on the farm

area distribution by source of power for primary tillage. The highly mechanized villages would comprise San Isidro, Lagare and Caalibangbangan. In these, about 94-98% of the area was plowed using 2- and/or 4-wheel tractors only, or in combination with a carabao (Table 6). The area tilled by tractors was 62% in Bunol and 71% in San Andres, and these would be classified as moderately mechanized. In contrast, the mechanized area in Kalikid Sur, Galvan and Narvacan I comprised only 26-33% of the total, thereby putting them in the non-mechanized category.

Distribution of landless laborers by length of residence in village

Table 7 shows that of 233 landless laborers in the sample villages, 32% have resided for more than 20 yrs. in the village, 21% each for 11-20 years and 6-10 yrs., 15% for 3-5 yrs. and 11% for less than 2 yrs. In most villages, the largest category of landless laboring households (29-42%) was those who had been resident in the village for more than 20 yrs. ago. Exceptions were San Isidro, Narvacan I, wherein the dominant length of residence was 6-10 yrs. and 11-20 yrs. respectively.

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Table 1. Distribution of households by occupational group in 8 villages of Cabanatuan City and Guimba, Nueva Ecija, March 1974.

Village	Total No.	Distribution of occupational group		
		Farm operator	Landless laborer	Non-agricultural worker
<u>Cabanatuan City</u>				
1. San Isidro	200	111 (55.5)	31 (15.5)	58 (29.0)
2. Lagare	153	107 (69.9)	28 (18.3)	18 (11.8)
3. Kalikid Sur	282	138 (48.9)	15 (5.3)	129 (45.7)
4. Caalibangbangan	410	198 (48.3)	70 (17.1)	142 (34.6)
<u>Guimba</u>				
1. Galvan	134	108 (80.6)	19 (14.2)	7 (5.2)
2. Narvacan I	89	72 (80.9)	7 (7.9)	10 (11.2)
3. San Andres	125	109 (87.2)	14 (11.2)	2 (1.6)
4. Bunol	283	199 (70.3)	49 (17.3)	35 (12.4)
<b>Total</b>	<b>1676</b>	<b>1042 (62.2)</b>	<b>233 (13.9)</b>	<b>401 (23.9)</b>

Number in parentheses refers to percent share in the village total.

Table 2. Farm and parcel number and size, 8 villages in Cabanatuan City and Guimba, Nueva Ecija, Philippines, wet season 1978.

Village	No. of farms	Total farm area (has)	Ave. farm area (has)	No. of parcels	No. of parcels per farm	Rice area (has)	Ave. rice area (has)	Rice cropping intensity (%)
<u>Cabanatuan City</u>								
1. San Isidro	111 (10.6)	260.71(12.2)	2.35	152(11.5)	1.37	254.31(12.7)	2.29	200.1
2. Logare	107 (10.3)	194.48( 9.1)	1.82	131(10.0)	1.22	194.48( 9.7)	1.82	172.9
3. Kalikid Sur	138 (13.2)	374.33(17.4)	2.71	162(12.6)	1.17	293.38(14.6)	2.13	107.2
4. Caalibangbangan	198 (19.0)	358.53(16.7)	1.81	214(16.6)	1.08	348.93(17.4)	1.76	179.6
<u>Guimba</u>								
1. Galvan	108 (10.4)	188.25( 8.8)	1.74	131(10.0)	1.21	183.25( 9.1)	1.70	104.5
2. Narvacan I	72 ( 6.9)	130.47( 6.1)	1.81	67( 6.6)	1.21	129.45( 6.5)	1.50	154.4
3. San Andres	109 (10.5)	215.67(10.0)	1.98	173(13.2)	1.59	209.21(10.4)	1.94	107.3
4. Bunol	199 (19.1)	421.92(19.7)	2.12	260(19.9)	1.31	394.24(19.6)	1.98	134.8
Total	1042(100.0)	2144.36(100.0)	2.06*	1310(100.0)	1.26*	2007.25(100.0)	1.93*	145.8*

Number in parentheses refers to percent share in the grand total.

\*Average for all villages.

Table 3. Distribution of farm area by level of irrigation, 8 villages in Cabanatuan City and Guimba, Nueva Ecija, Philippines, wet season 1978.

Village	Total has.	Ha. rainfed	Ha. irrigated		
			one crop	Two crops	Three or more crops
<u>Cabanatuan City</u>					
1. San Isidro	260.71	4.70 (1.8)	40.93 (15.7)	169.46 (65.0)	45.62 (17.5)
2. Lagare	194.48	1.94 (1.0)	39.10 (20.1)	153.44 (78.9)	-
3. Kalikid Sur	374.33	342.89 (91.6)	4.49 (1.2)	26.95 (7.2)	-
4. Caalibangbangan	358.53	2.15 (0.6)	70.99 (19.8)	285.39 (79.6)	-
<u>Guimba</u>					
1. Galvan	188.25	171.68 (91.2)	8.10 (4.3)	8.47 (4.5)	-
2. Narvacan	130.47	41.10 (31.5)	18.53 (14.2)	70.84 (54.3)	-
3. San Andres	215.67	196.91 (91.3)	3.02 (1.4)	15.74 (7.3)	-
4. Bunsol	421.92	229.10 (54.3)	45.99 (10.9)	146.83 (34.8)	-
Total	2144.36	990.47 (46.2)	231.15 (10.8)	877.12 (40.9)	45.62 (2.1)

Number in parentheses refers to percent share in the village total.

Table 4. Farm size distribution and gini coefficients, 8 villages in Cabanatuan City and Guimba, Nueva Ecija, Philippines, March 1979.

	Total farms		Farm size distribution (2)														Gini coefficient
			0.00-0.50		0.51-1.00		1.01-2.00		2.01-3.00		3.01-5.00		5.01-10.00		Above 10.00		
	No.	Area(ha)	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	
<u>Cabanatuan</u>																	
1. San Isidro	111	260.71	6.3	1.1	18.0	7.3	27.9	20.1	36.9	43.9	8.1	14.0	-	-	2.7	13.6	0.57
2. Lagare	107	194.48	11.2	2.6	23.4	12.5	41.1	37.5	16.8	25.2	5.6	12.5	1.9	9.7	-	-	0.56
3. Kalikid Sur	138	374.33	2.9	0.5	15.9	5.8	31.9	21.3	24.6	25.6	20.3	32.1	3.6	9.0	0.7	5.6	0.55
4. Caalibangbangan	198	358.53	14.1	3.4	20.2	10.7	29.8	28.3	30.8	46.2	4.5	9.5	0.5	1.9	-	-	0.59
<u>Guimba</u>																	
1. Galvan	108	188.25	7.4	2.0	22.2	12.4	46.3	42.6	19.4	31.2	3.7	9.0	0.9	2.8	-	-	0.62
2. Narvacan I	72	130.47	9.7	2.1	26.4	14.0	56.1	32.7	15.3	23.0	11.1	23.8	1.4	4.4	-	-	0.58
3. San Andres	109	215.67	8.2	1.8	20.2	9.9	36.7	29.9	25.9	32.1	8.2	18.8	2.8	7.5	-	-	0.58
4. Bunoi	199	421.92	10.1	1.9	25.1	11.4	24.1	19.6	27.6	36.2	11.1	20.7	1.5	4.6	0.5	5.6	0.54
Total	1042	2144.36	9.1	1.9	21.3	10.0	32.8	26.9	25.6	34.3	9.1	18.2	1.5	5.0	0.5	3.7	

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Table 5. Number of farm power sources and land-power source ratio, 8 villages in Cabanatuan City and Guimba, Nueva Ecija, Philippines, March 1979.

Village	Number						Land-power source ratio (has/carabao or machine)					
	Carabao	2-wheel tractor	4-wheel tractor	Thresher	Rice mill	Pump	Carabao	2-wheel	4-wheel	Thresher	Rice Mill	Pump
<u>Cabanatuan City</u>												
1. San Isidro	26 (3.4)	46 (45.5)	1 (12.5)	4 (50.0)	2 (33.3)	3 (2.9)	10.02	5.67	260.71	65.18	130.36	86.90
2. Lagare	43 (5.6)	33 (32.7)	1 (12.5)	-	-	2 (1.9)	4.52	5.89	194.48	-	-	97.24
3. Kalikid Sur	202(26.2)	-	-	-	-	9 (8.7)	1.85	-	-	-	-	41.59
4. Caalibangbangan	149(19.4)	16 (15.8)	4 (50.0)	2 (25.0)	2 (33.3)	2 (1.9)	2.41	22.41	89.63	179.27	179.27	179.27
<u>Guimba</u>												
1. Galvan	49 (6.4)	1 (1.0)	-	-	-	4(4.0)	3.84	188.25	-	-	-	47.06
2. Narvacan I	57 (7.4)	-	-	-	-	27(26.2)	2.29	-	-	-	-	4.83
3. San Andres	78(10.1)	4 (4.0)	-	-	-	20(19.4)	2.76	53.92	-	-	-	10.78
4. Sunol	166(21.5)	1 (1.0)	2(25.0)	2 (25.0)	2 (33.3)	36(35.0)	2.54	421.92	210.96	210.96	210.96	11.72
Total	770(100.0)	101 (100.0)	8(100.0)	8(100.0)	6(100.0)	103(100.0)	2.78*	21.23*	268.04*	268.04*	357.39*	20.82*

Number in parentheses refers to percent share in grand total.

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Table 6. Distribution of area by source of power for primary tillage (plowing), 8 villages in Cabanatuan City and Guimba, Nueva Ecija, Philippines, wet season 1978.

Village	Total area (has)	Distribution of area by source of power for primary tillage (has)					
		Carabao	2-wheel tractor	4-wheel tractor	Carabao + 2-wheel tractor	Carabao + 4-wheel tractor	2-wheel tractor + 4-wheel tractor
<u>Cabanatuan City</u>							
1. San Isidro	260.71	4.17 (1.6)	131.14 (50.3)	3.39 (1.3)	118.36 (45.4)	3.65 (1.4)	-
2. Lagare	194.48	12.45 (6.4)	99.77 (51.3)	10.50 (5.4)	51.73 (26.6)	16.53 (8.5)	3.50 (1.8)
3. Kalikid Sur	374.33	276.26 (73.8)	5.99 (1.6)	28.82 (7.7)	55.40 (14.8)	5.99 (1.6)	1.87 (0.5)
4. Calibangbangan	358.53	21.87 (6.1)	65.97 (18.4)	52.34 (14.6)	119.39 (33.3)	49.12 (13.7)	49.84 (13.9)
<u>Guimba</u>							
1. Galvan	188.25	133.47 (70.9)	1.50 (0.8)	3.58 (1.9)	39.91 (21.2)	5.27 (2.8)	4.52 (2.4)
2. Narvacan I	130.47	87.42 (67.0)	6.78 (5.2)	19.57 (15.0)	3.52 (2.7)	7.44 (5.7)	5.74 (4.4)
3. San Andres	215.67	61.68 (28.6)	25.67 (11.9)	20.27 (9.4)	62.54 (29.0)	29.33 (13.6)	16.18 (7.5)
4. Bunol	421.92	161.18 (38.2)	9.28 (2.2)	70.46 (16.7)	37.97 (9.0)	29.11 (6.9)	113.92 (27.0)
Total	2144.36	758.50 (35.4)	346.10 (16.1)	208.93 (9.7)	488.82 (22.8)	146.44 (6.8)	195.57 (9.1)

Number in parentheses refers to percent share in the village total.

Table 7. Distribution of landless laborers by length of residence in the village, 8 villages in Cabanatuan City and Guimba, Nueva Ecija, Philippines, March 1979.

Village	Total no.	Distribution by length of residence in the village (yrs.)				
		0 - 2	3 - 5	6 - 10	11 - 20	Above 20
<u>Cabanatuan City</u>						
1. San Isidro	31	3 (9.7)	5 (16.1)	10 (32.3)	8 (25.8)	5 (16.1)
2. Lagare	28	2 (7.1)	6 (21.4)	7 (25.0)	5 (17.9)	8 (28.6)
3. Kalikid	15	3 (20.0)	1 (6.7)	-	5 (33.3)	6 (40.0)
4. Caalibangbangan	70	6 (8.6)	11 (15.7)	14 (20.0)	13 (18.6)	26 (37.1)
<u>Guimba</u>						
1. Galvan	19	-	1 (5.3)	7 (36.8)	3 (15.8)	8 (42.1)
2. Narvacan I	7	-	1 (14.3)	2 (28.6)	3 (42.9)	1 (14.3)
3. San Andres	14	4 (28.6)	2 (14.3)	2 (14.3)	1 (7.1)	5 (35.7)
4. Bunol	49	7 (14.3)	8 (16.3)	7 (14.3)	12 (24.5)	15 (30.6)
Total	233	25 (10.7)	35 (15.0)	49 (21.0)	50 (21.5)	74 (31.8)

Number in parentheses refers to percent share in village total.

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