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A STUDY ON RURAL LABOR MOBILITY IN RELATION TO INDUSTRIALIZATION AND URBANIZATION IN TAIWAN

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I. Summary

1. In the last decade, Taiwan has experienced a rapid economic progress and an upsurge of population. The expansion of industries has simultaneously brought about a sizeable magnitude of urbanization and migration of labor force from rural to urban centers. Over 13,000 factories had either been built or expanded their capacity in this period and a great portion of these plants are located in the Taipei, Kaohsiung and Taichung metropolitan areas covered in this study. The population of these three areas has increased by almost 50 percent while employment was up by about 28 percent. Communication and transportation showed the greatest rate of growth in employment followed by industry and mining. Agricultural sector registered the least growth.

2. On the average, eight out of ten farm households have had off-farm employment opportunities. The number of moved out per 100 farm households amounted to 156 persons, working as commuters or seasonal workers or long-term employees. Kaohsiung area has the greatest rate of labor mobility with Taipei and Taichung areas followed in order. A negative correlation was found between the rate of labor mobility and farm size. Generally speaking, the smaller the farm size, the bigger the mobility and vice versa. A farm household cultivating no land but with 8.8 persons has to have three persons moving out for off-farm jobs. On the other hand, no move out seems necessary for farms with more than four hectares of farm land. The same relationship was reflected between the rate of mobility and cash farm income. The regression line of these two factors indicates that the more cash income received by a farm family, the less of farm members moved out, and when a farm's cash income reaches to NT$67,000, it seems no need for family members to go out for non-farm jobs. Thus, it is very clear that the small farm size, low cash income and surplus labor force of rural families are

This research was carried out under the sponsorship of the Rural Economics Division, Sino-American Joint Commission on Rural Reconstruction. Originally, Dr. S.C. Hsieh of JCRR was interested in this subject matter. The authors have recceived helpful advice from Mr. T. H. Lee of JCRR. The authors, however, bear sole responsibility for any errors.

the principal factors driving rural people out for better paid jobs.

3. Rural labor mobility was also related with the availability of labor supply on farms. As cropping pattern and method of cultivation dictate to a large extent the requirement of labor for farm operations, it also affects the supply of labor from farms. Taking the amount of hired labor as criteria for measuring the requirement and the supply of labor, the non-labor moving farm families employed almost twice the amount of hired labor than that of the labor moving families. In other words, the non-labor moving farm families have to hire relatively more outside helper and supply less working force to the labor market. The reverse situation is true to the labor moving farm families.

4. The types of jobs engaged and income received by the moved-out workers varied considerably between sex, age and terms of employment. Most of the male commuters were hired as public officials, teachers and factory workers, while females worked largely as factory girls and handicraft employees. The male workers received almost twice as much salaries as that of the females. In seasonal work, over eight out of ten of both male and female workers were engaged in farming activities. For long-term employees over one half of the male worked as factory workers, public officials and teachers. There is a great contrast of age composition of the moved-out workers. Generally speaking, males look for outside jobs at a much matured age than females. Majority of the males started to accept outside jobs at 20 while females at 15.

5. The level of education stands as the most important factor affecting labor mobility in the rural areas. The higher the level of education farmers received the easier for them to get outside jobs and with better pay. Out of the 6,510 working-age persons investigated almost 40 percent received no school education, while well over one half attended only primary schools. The majority of these people stayed at home. On the other hand, about two-thirds of the high school and vocational school graduates found jobs. No college graduate stayed at home or worked on farms. These facts indicate that to reduce under-employment and unemployment in the rural areas, proper education and training of farm people is still the key of the problem.

Ⅰ. Introduction

Labor is the most basic resource for economic development, especially in countries where natural and capital resources are limite. The change of hu man resources both

quantitatively and qualitatively may affect the course of economic development. On the other hand, economic policy and planning will influence the development of human resources. It is a well-known fact that the economic development of Taiwan in the last decade was remarkable, while population upsurge in the same period was amazing. In constant value the net domestic products increased from 1952 to 1961 by 88 percent while population or the source of labor also jumped by 34 percent.

This progress of economic development and population expansion has brought significant changes of economic structure and labor supply of the island. Industrial production was more than doubled against a 69 percent increase in agriculture. The relative weight of these two sectors in net domestic products reflected a reverse trend. The weight of industry increased from 18 percent to 22 percent while the weight of agriculture dwindled from 35 percent to 32 percent. This was the natural and right course of development although it was not fast enough as what we wanted to. Obviously, the relatively fast progress of industry has helped to some extent not only to national economic advancement but also to urbanization and employment. One evidence is that the increase of urban population was much faster than that of rural while the rate of natural increase of both urban and rural population was about the same. Definitely, this was the result in partial at least the migration of labor force from rural to urban areas affected from industrialization and urbanization. In the same period, the total labor force of the island increased from 4,9 millions to 6.3 millions. Meanwhile, the absolute number of agriculture labor has also been mounting, although its rate of increase has been declining relative to other sectors of the economy. This trend together with the shortage of arable land has affected a steady decrease in farm size, an intensification in farming and a further underemployment of labor in the rural areas.

To what extent industrialization and urbanization have helped in creating jobs for the rural people, what are the prospects of industrialization and urbanization in absorbing the rural people in the future, and what are the conditions required for the rural people to fit in non-farm jobs, are some of the vital problems for which economic planners and policy makers must appreciate, if a wholesomc economic development is to be achieved. It is the aim of this study that some of these vital problems may be analyzed through an investigation of a few of the urban centers. The selected Taipei, Kaohsiung and Taichung metropolitan areas covered in this study are the most urbanized centers of

Taiwan. The study of these three areas marks only the beginning of continuous investigation and more detailed analysis of these problems in the near future.

Ⅱ. Methodology of the study

In carrying out this study, labor requirements under present farming system are considered as constant. Based on this assumption, investigations on the magnitudes, types of migration, status of economiy, social and education of farmers were made.

Cities and townships of Taiwan were classified according to the rates of urbanization and industrialization in the past ten years by using the available demographical statistics. The cities and townships having the higher rate of urbanization and industrialization were selected as the target areas. Accordingly, Taipei city and two adjacent prefectures were chosen in the first survey. Ten sample townships out of all the thirty-three townships surrounding Taipei city were selected by random sampling method. Followed was a survey conducted in Kaohsiung city and surrounding townships of southern Taiwan. Ten townships out of 28 were selected as the target area. The third survey was centered around the central part of Taiwan, ten townships out of Taichung, and Changhua prefectures were chosen. Table 1 shows the number of townships, the date, and sample size of the investigations in these three districts.

Table 1. Districts, Number of Households, Number of Townships and Date of Survey

District	Households surveyed	Number of townships 1)	Date of survey
North	520	10	September 1962
Central	518	10	April 1963
South	415	10	January 1963
Total	1,453	30	

A total of 1,453 farm households were selected at random from these 30 townships. The sample farm households were interviewed on prepared questionnaire containing the following items: labor structure of the farm household; position and education of the moved-out members; distance, time, and motive of movement; effects of labor movement on farm income; effects on farm operation; nature of movement; causes of changes of movement; and attitudes of family towards movements.

1) See appendix 1

IV. Findings of the study

1. Magnitude of industrialization and labor movement in the surveyed districts:

The target areas including the north, central, and south account to 8,548 square kilometers or about 24 percent of the whole area of Taiwan, covering a total population of about five millions at the end of 1962, or about 44 percent of the total population of the island. These three districts are the political, commercial and industrial centers of Taiwan.

The industry of Taiwan has made a rapid stride since 1952. More than 13,100 of the factories and plants have either been built or expanded their capacity during this period. And majority of these factories are located in these target areas. Textile, chemical, electric and food processing plants are the major ones. This industrial expansion has resulted in a rapid increase in urban population, showing 49 percent increase on the average, 67 percent in Taipei city, 50 percent in Taichung city, and 73 percent in Kao-hsiung city. Employment has also been increased from 1,104,650 in 1952 to 1,409,341 in 1962. or a growth of approximately 28 percent; 42 percent for northern district, 16 percent for central district, and 25 percent for southern district. In the growth of labor force in different sectors, agricultural labor increased by only 12 percent, mining by 35 percent, industry by 51 percent, commerce by 29 percent, and communication and transportation by 78 percent.

2. Nature and character of labor movement:

Of the total of 1,453 farm households interviewed, 1,160 or 80 percent have members worked as commuters or seasonal workers, or long-term employees, either exclusively or in combination of the three types of labor movements.

For easier comparison of labor movements among districts, the number of moved-out has been adjusted on the basis of 100 farm households.

Table 2. Number of Moved-out per 100 Farm Households, Classified by Nature of Movement and by District 2)

District	Commuters			Seasonal workers			Long-term emp.			Total		
	Male	Female	Sub-total	Male	Female	Sub-total	Male	Female	Sub-total	Male	Female	Grand total
North	27	14	41	67	6	75	24	9	33	120	29	149
Central	15	8	23	59	6	65	37	10	47	111	24	135
South	35	9	44	70	26	96	39	13	52	144	48	192
Total	25	10	35	66	12	78	33	10	43	124	32	156

2) See appendix 2

The southern district had the highest rate of movement pertaining to commuters, seasonal workers, and long-term employees, the north came next and the central registered the lowest. In the case of commuters, the north and south each accounted more than 40 persons in per 100 households, while the central district claimed only 23 persons. This is due to the fact that the central district is essentially an agricultural region, and has less job opportunities for commuters.

Among the seasonal workers, male-workers occupied about 85 percent and female-workers, 15 percent. But down to the south, females occupied 27 percent compared to only eight percent for the north, and nine percent for the central. The major reason lies in that many female workers in the southern area engaged in temporary farming works, especially for the Taiwan Sugar Corporation.

The number of long-term employees was followed the order of 52 persons per 100 households for the south, 47 persons for the central, and 33 persons for the north. A positive tendency was found between moving distance and term of employment, namely, the longer the distance from metropolitan area, the more the long-term employees.

As the northern farm households are relatively near Taipei city, a lot of the move-outs worked as commuters. But in the southern and central districts, distance deters workers from commuting.

3. Relationships between moving-rate and farm size:

Table 3. Relationships between Moving-Rate and Farm Size

Farm size Ha.	North			Central			South			Total		
	A	B	$\frac{B}{A}$%	A	B	$\frac{B}{A}$%	A	B	$\frac{B}{A}$%	A	B	$\frac{B}{A}$%
Less than 0.5	986	260	26.4	1209	249	20.6	954	293	30.7	3149	802	25.5
0.5–1.0	1474	345	23.5	1535	227	14.8	1206	263	21.8	3215	835	19.8
1.0–1.5	1072	197	18.4	718	94	13.1	689	98	14.2	2479	389	15.7
1.5–2.0	405	66	16.3	329	43	13.1	460	62	13.5	1194	171	14.3
More than 2.0	505	62	12.3	770	87	11.3	517	80	15.5	1792	229	12.8
Total	4442	930	20.9	4561	700	15.3	3826	796	20.8	12829	2426	18.9

A: Total farm population.

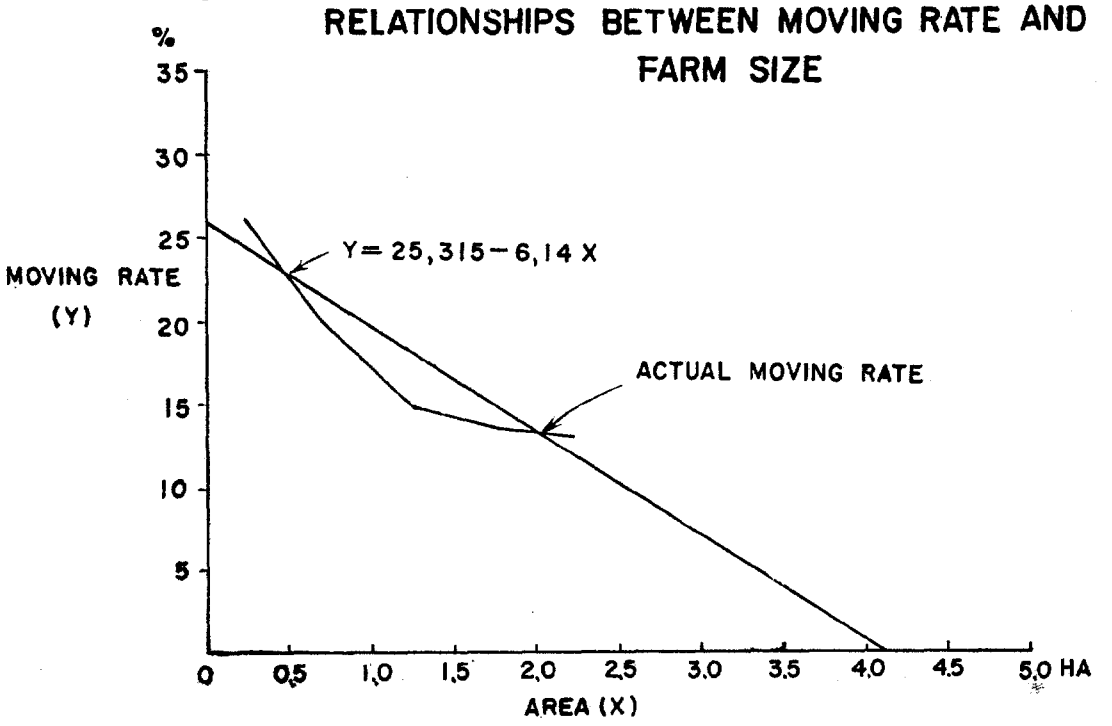
B: Moved-out member.

$\frac{B}{A}$: Moving rate.

The moved-out members consist of seasonal workers, commutes, and long-term employees. It is very clear that the ratio of moving rate and farm size shows a negative correlation. For instance, there is 25.5 percent moving rate in the farm size of less than 0.5 hectare, it reduces gradually to 15.7 percent in 1.0–1.5 hectares group and 12.8 percent in more than 2.0 hectares group. Expanding this relationship to other farm sizes, the results can be seen in Figure 1, based on the equation $Y=25.315-6.14X$. In the extreme cases, three workers would move out for farm households without land but with 8.8 persons, and no moved-out seems necessary for households with 4.12 hectares of farm land.

Comparing the three districts investigated, the north and the south had about the same moving rates, being 20.9 percent and 20.8 percent, respectively, while the central district had only 15.3 percent. The reason for the higher rates in the north and south seems that the famous industrial and commercial center in metropolitan Taipei absorbed more labor from rural areas and the southern harbor, Kaohsiung, also absorbed quite a number of labor in factories. Moreover, the Taiwan Sugar Corporation offered jobs for seasonal farm labor. Since the central part of Taiwan is a conspicuous double paddy field district, it has relatively less job opportunities for both skilled and unskilled labor.

Figure 1.



4. Number of moved-out and cash farm income:

Generally speaking, farm families with higher cash income require less number of moved out, and vice versa. The major sources of cash farm income rest largely on the selling of rice, vegetables and hogs. The relationship between cash income and moved-out persons is shown in the following table.

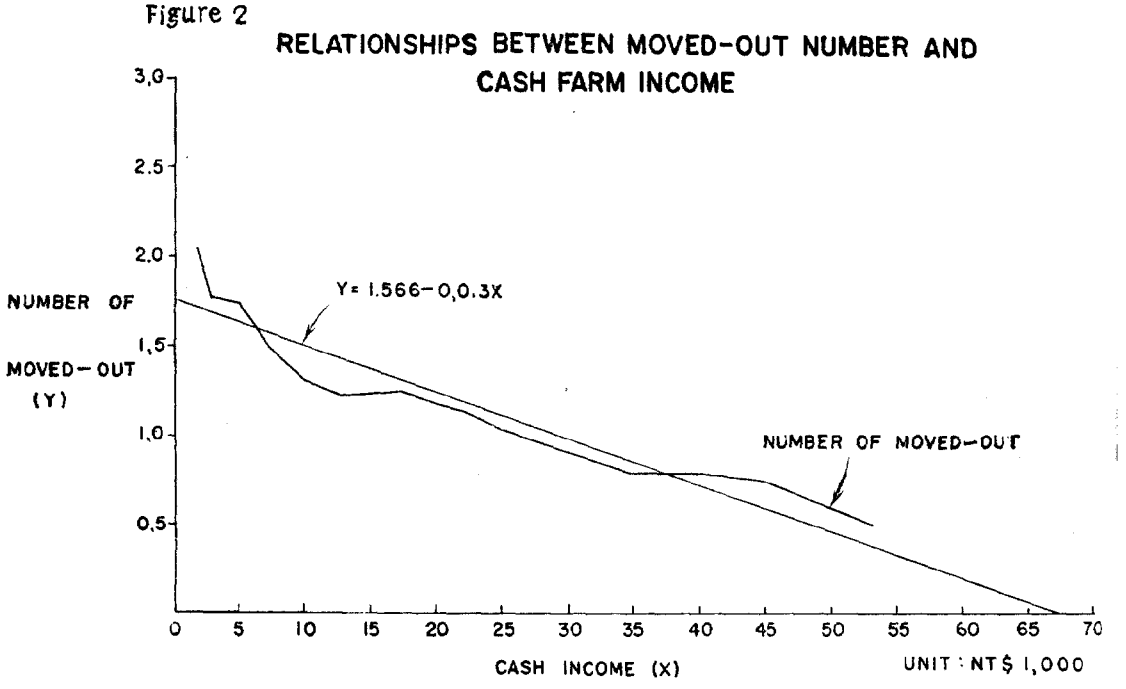
Table 4. Relationships between Cash Farm Income and Number of Moved-out per Farm

Unit: NT$1,000

Cash farm income	Less than 2	2–4	4–6	6–8	8–10	10–15	15–20	20–30	30–40
No. of moved-out persons	2.06	1.82	1.72	1.52	1.37	1.31	1.22	1.05	1.78

This relationship can also be interpreted with a regression line: $Y=1.768-0.026X$ (where Y=number of moved-out, X=cash income) indicating that an additional increase of NT$1,000 of cash farm income will result in a decrease of 0.03 moved-out person. When a farm family's cash income reaches to NT$67,000 a year, with 8.8 persons in the family there seems no need for family members to go out for non-farm work and would have no surplus labor because of larger farm size (See Figure 2).

Figure 2



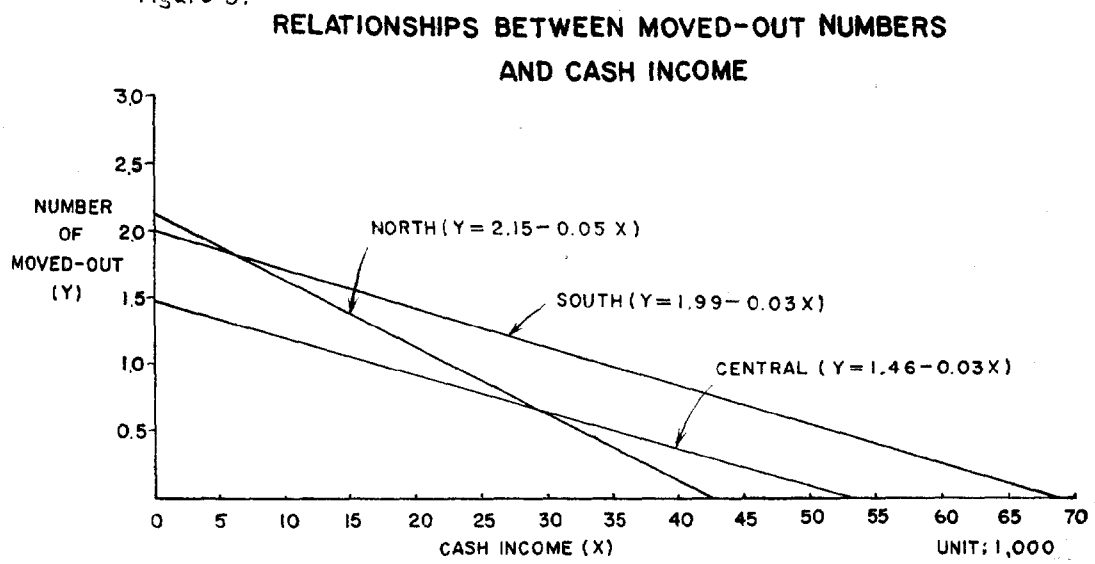
The equations for individual districts showing the relationships between cash income and moved-out numbers are given below:

North:	$Y=2.145-0.0497\ X$
Central:	$Y=1.457-0.027\ X$
South:	$Y=1.994-0.029\ X$

Families which cultivate no land depend heavily on off-farm jobs. On the average, they have to send out 2.15 persons for work in northern area, 1.99 persons in southern area, and 1.46 persons in central area. It is apparent that north farmers are more in need of such jobs than southern and central farmers, because many northern farmers live in the mountain areas. The southern farmers are not so bad but still lack of water facilities in some areas. For example, in Yen-tsao and Lu-chu Hsiang, lots of cultivated land are not efficiently used owing to insufficient supply of water. Generally speaking, farmers in central area are lucky enough to have fertile land and plenty of water, and received relatively higher farm income. This is the reason why they need fewer people to go out for work.

On the other hand, no moved-out member is required for a northern farm with NT$43,000 of cash income, a central farm, NT$54,000, and a southern farm NT$69,000 a year. The difference of income level between districts may come from the fact that northern farmers have a higher degree of self-sufficiency and less marketable products. The central and southern farmers on the other hand have relatively greater portion of their products marketable. In other words, their degree of self-sufficiency is relatively low. As the degree of self-sufficiency influences the need of cash for maintaining a given standard of living, this factor also affects the mobility of farm labor.

Figure 3.



5. Land ownership and labor movement:

Land ownership is usually classified into three categories in Taiwan; owner-cultivator, half-owner-cultivator, and tenant. The result of this survey shows the relationship between land ownership and farm labor moving rates as that tenants on the average have the highest moving rate, owner-cultivators the next and half-owner-cultivators the lowest. The reason of the highest moving rate in tenants lies not only in their relatively heavier burden of land rent but also in their small farm size which stands for only 0.64 hectare per household in the 115 farm families interviewed. This also explains why the half-owner-cultivator has the lowest moving rate. The half-owner-cultivator has an average of 1.36 hectares in the 206 farm families, it is much higher than the average of the total farms surveyed, being 0.96 per farm.

Table 5. Distribution and Moving Rates of Farm Labor by Land Ownership

District	Total			Tenant			Half-owner-cultivator			Owner-cultivator		
	A	B	$\frac{B}{A}$%	A	B	$\frac{B}{A}$%	A	B	$\frac{B}{A}$%	A	B	$\frac{B}{A}$%
North	4,442	930	20.9	437	113	25.9	981	175	17.8	3,024	642	21.2
Central	4,561	700	15.4	224	39	17.4	674	89	13.2	3,663	572	15.6
South	3,826	796	20.8	319	74	23.2	452	112	24.8	3,055	610	20.0
Total	12,829	2,426	18.9	980	226	23.1	2,107	376	17.8	9,742	1,824	18.7

A: Total farm population.

B: Number of moved-out.

$\frac{B}{A}$: Moving rate.

6. Availability of labor supply on farms and labor movement:

The number of moved-out in the farm family depends not only on the farm size, cash farm income and land ownership but also on the availability of labor supply and requirement of labor on the farm. In the surveyed areas, the cultivating method and cropping pattern varied considerably. As a result labor requirements on farms are also different. To avoid the complexity for comparison of labor requirement in different districts, the average working days of hired labor are used as an indicator of labor supply on farms.

Table 6. Average Working Days of Hired Labor Classified by District

District	Non-labor-moving farm family			Labor moving farm family		
	A	B	$\frac{A}{B}$	A	B	$\frac{A}{B}$
North	2,233	21	106.3	19,468	499	39.0
Central	7,215	142	50.8	17,221	376	45.8
South	6,697	65	103.0	7,888	350	22.5
Total	16,145	228	70.8	44,577	1,225	36.4

A=Total working days of hired labor.

B=Number of farm family.

$\frac{A}{B}$=Average working days of hired labor per farm.

Obviously, non-labor-moving farm families employed almost twice the amount of hired labor than that of labor-moving farm families. The former used 70.8 working days of hired labor while the latter hired only 36.4 days.

Comparing individual districts, the central area hired 50.8 days a year in the non-labor-moving family, while the north and the south employed more than 100 working days respectively. A reverse condition was found in the labor moving families. The central area hired 45.8 working days, whereas the north and the south employed 39.0 and 22.5 days respectively. The farmers in central Taiwan endowed with fertile land, practice, in general, labor intensive horticultural farming, as this area is one of the most famous vegetable zones. Accordingly, they used their own labor intensively in non-labor-moving families and hired more labor in labor moving families.

7. Types of job and income of the moved-out labor:

The types of jobs engaged by male and female moved-out workers are quite different. In the case of male commutes, 27.5 percent worked as public officials and teachers, 27.1 percent as factory workers, 14.4 percent as miners, 9.0 percent in small enterprise, 7.6 percent in communication and transportation, and 8.7 percent as other workers. While in female commuters, 44.2 percent were factory girls, 20.1 percent handicraft employees, and 15.5 percent public officials and teachers (see Table 7).

The average male commuter got NT$880 a month, whereas a female received NT$468 per month. And 41 percent of commuters found their jobs by introducion or recom-

Table 7. Types of Job and Income of Commuters Classified by District and Sex

Unit: Person

	District	Mohthly income NT$	Types of jobs										
			Total	Farming	Mining	Factory labor	Small enter-prise	Clerks	Public off-cials & teacher	Communi-cation and transpor-tation	Handi-craft	Carpenter and plasterer	Others
Male	North	857	142	2	53	25	9	1	16	14	2	10	10
	Central	902	78	–	–	16	6	2	38	5	1	4	6
	South	890	147	4	–	58	18	1	47	9	3	2	5
	Average and sub-total	880	367	6	53	99	33	4	101	28	6	16	21
	Percentage		100	1.6	14.4	27.1	9.0	1.1	27.5	7.6	1.6	4.4	5.7
Female	North	455	72	2	1	44	–	3	4	1	10	1	6
	Central	508	41	–	–	13	–	2	13	1	8	–	4
	South	449	36	3	–	9	2	2	6	1	12	–	1
	Average and sub-total	468	149	5	1	66	2	7	23	3	30	1	11
	Percentage		100	3.4	0.7	44.2	1.3	4.7	15.5	2.0	20.1	0.7	7.4
	Average and total	761	516	11	54	165	35	11	124	31	36	17	32
	Percentage		100	2.1	10.5	31.9	6.8	2.1	24.1	6.0	7.0	3.3	6.2

mendation of their relatitves and about 20 percent got jobs by themselves.

About 80 percent of the male and 83 percent of the female seasonal workers engaged in farming during busy seasons. The survey reveals that a male seasonal worker received NT$37 a day, while a female got NT$16 only. Since their work is seasonal, these workers worked a little less than 100 days a year. Accordingly, a male seasonal worker earned approximately NT$3,500 and a female NT$1,600 a year. Most of workers answered that they were asked to help their neighboring farms during busy seasons and some of the southern farmers worked for the Taiwan Sugar Corporation (see Table 8).

The long-term male workers employed in factories occupied 30.5 percent, public officials and teachers 21.1 percent, clerks 12.8 percent, and communication and transportation 7.9 percent. On the other hand, the female workers were hired mainly as maid-servants, being 32.3 percent, factory girls 25.5 percent, barbers 10.7 percent, and teachers 10.8 percent. The annual income of a male long-term employee amounted to NT$10,000, whereas a female got about NT$7,000 a year. They remitted some 40 percent of their income to their homes (see Table 9).

The distance to working places was relatively short. On the average, about 64 percent of the male commuters spent less than 30 minutes, and 24.5 percent needed 30 minutes to an hour. The female commuters worked much closer to their homes, 82.6 percent of them were within 30 minutes distance and 9.4 percent spent from 30 to 45 minutes (see Table 10).

Table 8. Types of Job and Income of Seasonal Workers Classfied by District and Sex

Unit: Person

	District	Working days	Receipts		Types of jobs								
			Daily wage	Yearly income	Total	Farming	Mining	Factory labor	Coolie	Carpenter & plasterer	Handi-craft	Maid and servant	Others
			NT$	NT$									
Male	North	111	41.9	4,562	357	252	37	9	15	17	4	–	23
	Central	72	29.5	2,124	306	275	–	3	14	9	–	2	3
	South	93	36.8	3,422	291	232	–	18	27	6	5	–	3
	Average and sub-total	93	36.9	3,432	954	759	37	30	56	32	9	2	29
	percentage				100	79.6	3.9	3.1	5.9	3.4	0.9	0.2	3.0
Female	North	114	18.9	2,074	34	24	2	1	–	–	5	–	2
	Central	63	13.5	851	33	27	–	6	–	–	–	–	–
	South	104	15.7	1,632	108	94	–	10	1	–	1	–	2
	Average and sub-total	98	15.8	1,548	175	145	2	17	1	–	6	–	4
	Percentage				100	82.9	1.1	9.7	0.6	–	3.4	–	2.3
	Average and total	94	33.6	3,158	1,129	904	39	47	57	32	15	2	33
	Percentage				100	80.1	3.5	4.2	5.0	2.8	1.3	0.2	2.9

Table 9. Types of Job and Income of Long-term Employees Classified by District and Sex

	District	Yearly income NT$	Remittance NT$	Types of jobs												
				Total	Farming	Mining	Factory labor	Small enterprise	Clerks public official & teacher	Communication & transportation	Handicraft	Carpenter and plasterer	Maid and servant	Barber	Others
Male	North	10,000	4,173	118	3	5	33	13	14	20	10	9	5	2	4	–
	Central	8.924	3,597	71	1	–	22	2	13	17	4	1	3	4	–	4
	South	11,465	4,250	53	2	–	19	1	4	14	5	2	2	2	1	1
	Average & sub-total	10,005	4,021	242	6	5	74	16	31	51	19	12	10	8	5	5
	Percentage			100	2.5	2.1	30.5	6.6	12.8	21.1	7.9	5.0	4.1	3.3	2.1	2.0
Female	North	7,050	3,489	47	–	–	14	–	4	5	–	1	–	20	3	–
	Central	5,837	2,029	30	–	–	11	–	5	3	1	4	–	6	–	–
	South	8,145	2,691	28	1	–	1	2	1	3	–	2	–	7	8	–
	Average & sub-total	6,962	2,864	102	1	–	26	2	10	11	1	7	–	33	11	–
	Fercentage			100	1.0	–	25.5	2.0	9.8	10.8	1.0	6.9	–	32.3	10.7	–
Average and total		9,357	3,678	344	7	5	100	18	41	62	20	19	10	41	16	5
Percentage				100	2.0	1.5	29.1	5.2	11.9	18.0	5.8	5.5	2.9	11.9	4.7	1.5

Table 10. Time Spent for Commuting

Unit: Minute

District	Total	Under 15	15–30	30–45	45–60	60 and over	Uncertain
Male							
North	142	40	44	17	25	10	6
%	100	28.2	31.0	12.0	17.6	7.0	4.2
Central	78	37	20	10	4	1	6
%	100	47.5	25.6	12.8	5.1	1.3	7.7
South	147	47	45	17	17	12	9
%	100	31.9	30.6	11.6	11.6	8.2	6.1
Total	367	124	109	44	46	23	21
%	100	33.8	29.7	12.0	12.5	6.3	5.7
Female							
North	72	29	30	9	3	1	-
%	100	40.3	41.6	12.5	4.2	1.4	-
Central	41	24	10	2	2	1	2
%	100	58.5	24.4	4.9	4.9	2.4	4.9
South	36	15	15	3	1	1	1
%	100	41.7	41.6	8.3	2.8	2.8	2.8
Total	149	68	55	14	6	3	3
%	100	45.7	36.9	9.4	4.0	2.0	2.0

8. Age composition of moved-out workers:

Age composition of moved-out workers varied considerably between terms of employment and sex of workers. Generally speaking, male workers accepted outside jobs at much a matured age than female workers. Most of the males look for outside jobs after they have reached twenty, while a great majority of females start to work for others at the age of fifteen and quit after they are married. Out of a total of 1563 male workers more than two-thirds are within the age between 20 to 40. On the other hand, over 80 percent of the female workers are concentrated on the age groups between 15 to 30. There is striking decrease in number of persons employed after the age of 40 for males and 30 for females (see Figure 4). From these facts, it may conclude that looking from the standpoint of social status, working ability and family economic conditions, males are most suitable for looking outside jobs at ages of 20 to 40.

For long-term male employees, employers seem to prefer young adult at ages between 20 to 30 although people from 15 to 20 and 30 to 35 appear also to have chances to compete for jobs. Most of the male commuters fall within the age groups between 25 to 40. Similar age distribution is reflected in seasonal male workers.

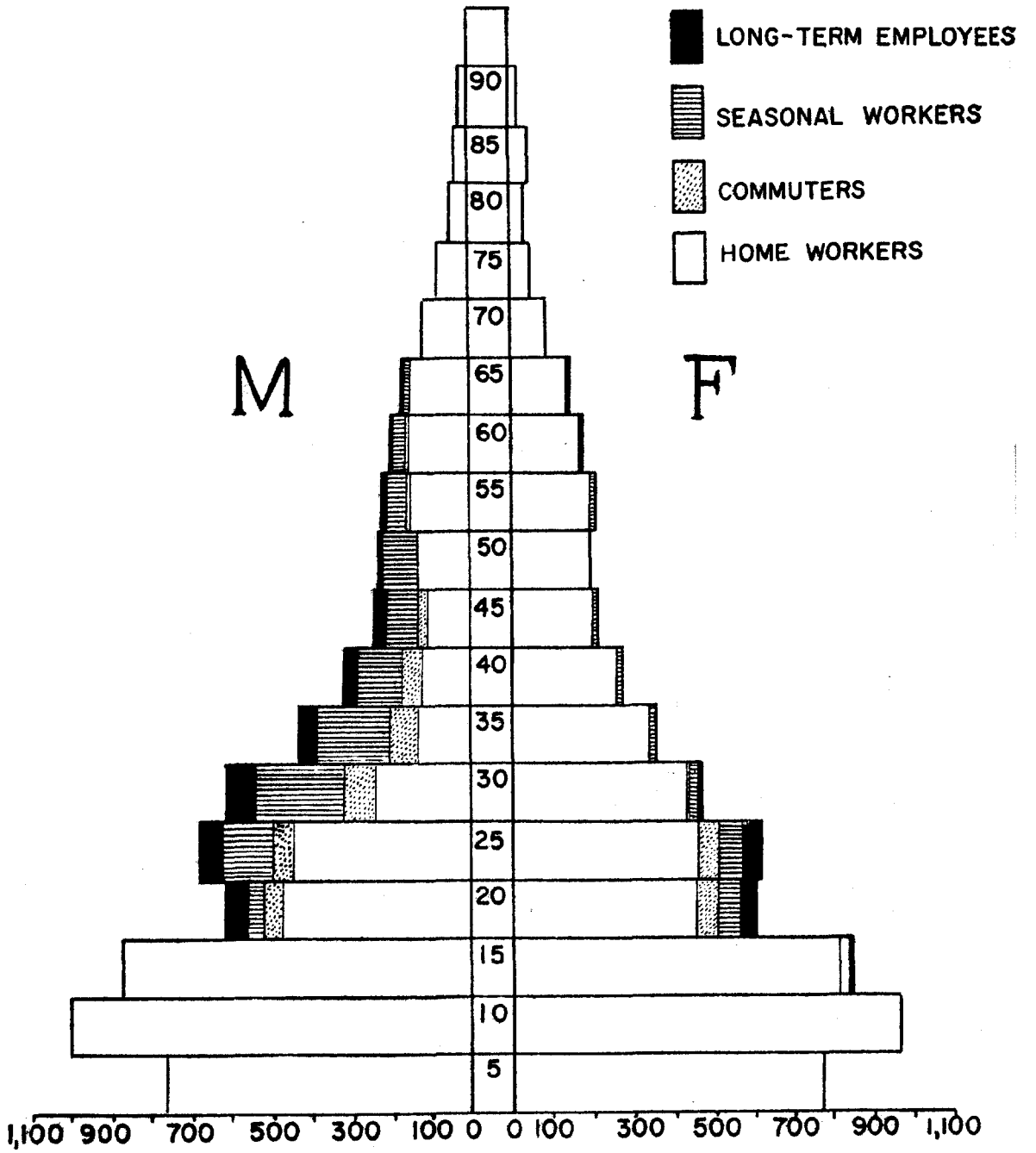
It is obvious that females tend to go out to look for jobs at ages between 15 to 25 regardless of long-term job, seasonal work and commuting opportunities.

Table 11. Age Composition of Moved-out workers

Age distribution	Total	Less than 14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60 and over
Male												
Long-term employee	242	4	49	58	57	43	17	7	4	1	–	2
Commuter	367	3	40	45	87	63	59	26	11	20	8	5
Seasonal worker	954	–	49	122	214	171	130	96	77	49	31	15
Female												
Long-term employee	102	13	36	33	10	3	4	3	–	–	–	–
Commuter	149	4	60	60	11	5	5	2	–	2	–	–
Seasonal worker	175	7	55	56	21	13	7	2	6	2	4	2

Figure 4.

AGE DISTRIBUTION OF MOVED-OUT WORKERS



9. Edudatioal levels of moved-out workers:

The educational levels of the 6,510 working age persons were classified into five categories: no education, primary school, junior high school, senior high school, and college.

As in all other countries, farmer's educational level in Taiwan was comparatively low relative to non-farm people. Almost 40 percent of them received no school education and 52 percent attended primary schools. Most of the non-educated rural people stayed at home and only 13 percent worked as seasonal workers, two percent as commuters and one percent as long-term employees. This condition also applies to people with primary and junior high school education. Well over one half remained at home. On the other hand, about two-thirds of the high school and vocational school graduates were employed either as commuters or long-term employees. It is worthwhile to note that no single college graduate stayed at home or worked on farms.

These facts clearly reflect that education is the most important factor affecting labor mobility in the rural areas. Generally speaking, the higher of education people received, the easier for them to get jobs with better pay. It is very difficult for non-educated people to find off-farm jobs. Even if they could find some work, they are usually seasonal in nature with rather low pay.

Table 12. Educational Levels of the Moved-out Workers

Educational level	Total	Stay at home	Seasonnal worker	Commuter	Long-term employee
No education	2,577	2,165	333	50	29
%	100	84	13	2	1
Primary school#	3,410	2,130	751	330	199
%	100	62	22	10	6
Junior high school#	345	171	39	75	60
%	100	50	11	22	17
Senior high school	164	50	6	56	52
Percentage	100	30	4	34	32
College	14	-	-	5	9
%	100	-	-	36	64
Total	6,510	4,516	1,129	516	349
%	100	69	17	9	5

#Including vocational school.

Appendix 1

Names of Townships

North: Ban-chao Chen, San-hsia Chen, Lin-kow Hsiang, Nan-kang Chen, Mu-shaw Hsiang, Shuang-chih Hsiang, Tan-shui Chen, Chin-shan Hsiang, Lu-chow Hsiang, and Shih-ding Hsiang.

Central: Shen-kang Hsiang, Shih-kang Hsiang, Da-chia Chen, Tai-ping Hsiang, Lung-ching Hsiang, Hsien-hsi Hsiang, Yuan-lin Chen, Erh-shui Hsiang, Yung-ching Hsiang, and Da-cheng Hsiang.

South: Fong-shan Chen, Hsiao-kang Hsiang, Yen-tsao Hsiang, Lu-chu Hsiang, Chia-ding Hsiang, Chiao-tou Hsiang, Chih-shan Chen, Mei-nung Chen, Da-shu Hsiang, and Yung-an Hsiang.

Appendix 2

Definitions of Workers

Commuter: A person who travels regularly back and forth from his farm home to his work and receives salary by month.

Seasonal worker: A person who works temporarily for others during his leisure time and gets wages per working day.

Long-term employee: A person who leaves his farm home and works rather permanently in the cities or some other places. However, he has close connection with his farm home, for instance, remittance of his earnings. For convenience, students lived outside, military servicemen and dependents of long-term employee are also included in this category.

Appendix 3 Basic Statistics of Agricultural Labor and Employment in Taiwan

Table 1. Labor Force of Agriculture and Other Sectors.

Unit: Thousand Persons

Year	Agriculture	Industry	Commerce and Others	Total
1949	1,773	221	834	2,828
1950	1,788	223	838	2,849
1951	1,785	241	855	2,881
1952	1,792	272	872	2,936
1953	1,812	271	871	2,954
1954	1,811	289	900	3,000
1955	1,812	296	918	3,026
1956	1,806	298	911	3,015
1957	1,810	323	977	3,110
1958	1,813	345	1,020	3,178
1959	1,853	362	1,057	3,272
1960	1,877	377	1,090	3,344
1961	1,912	387	1,130	3,429
1962	1,936	404	1,163	3,503

Source: Household Registration Year Book 1949–1961 PDCA

Table 2. Labor in The Farm Economy

Average number of farm families	8.26 persons
Main operator	1.73
Helper	1.84
Farm worker	3.57
Man-equivalent labor unit	2.15
Farm receipts	NT$ 24,639.06
Non-farm receipts	9,864.66
Total	34,503.72
Farm operating expenses	11,537.93
Net farm family income	22,965.80
Net farm family income per worker	6,432
Net farm family income per man-equivalent	10,681

Note: The 1962's Farm Income Survey

Table 3. Per Capita Income of Labor in Agriculture and Other Economic Sectors, 1951–1962

(At Current Price)

Year	Agriculture NT$ (1)	Industry NT$ (2)	Commerce and others NT$ (3)	Total NT$ (4)	(1)/(2)	(1)/(3)	(1)/(4)
1951	1,694	7,427	4,836	3,106	0.23	0.35	0.55
1952	2,564	8,441	7,063	4,445	0.30	0.36	0.58
1953	3,888	10,996	9,024	6,055	0.35	0.43	0.64
1954	3,462	11,945	10,099	6,270	0.29	0.34	0.55
1955	4,163	14,645	11,642	7,457	0.28	0.36	0.56
1956	4,738	17,812	13,371	8,639	0.27	0.35	0.55
1957	5,318	20,118	14,250	9,661	0.26	0.37	0.55
1958	5,738	20,414	15,102	10,337	0.28	0.38	0.56
1959	6,351	24,006	17,101	11,777	0.26	0.37	0.54
1960	8,732	26,854	19,724	14,358	0.33	0.44	0.61
1961	9,772	29,328	20,971	15,670	0.33	0.47	0.62
1962	9,318	33,874	23,286	16,787	0.28	0.40	0.56

Table 4. Population-Rate of Natural Increase in Cities and Townships, 1953-1962

	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
1. Total										
Total population	8,438,016	8,749,151	9,077,643	9,390,381	9,690,250	10,039,435	10,431,341	10,792,202	11,149,139	11,511,728
No. of birth	374,536	383,574	403,683	414,036	394,880	410,885	421,458	419,442	420,254	423,469
No. of death	78,078	70,181	76,585	74,075	80,714	74,741	74,052	73,715	78,823	72,921
Birth rate	44.39	43.84	44.47	44.09	40.75	40.93	40.40	38.87	37.69	36.79
Death rate	9.25	8.02	8.44	7.89	8.33	7.44	7.10	6.83	6.62	6.33
Natural increase	35.14	35.82	36.03	36.20	32.42	33.49	33.30	32.04	31.07	30.46
2. Cities#										
Total population	1,595,402	1,671,705	1,758,287	1,854,507	1,931,264	2,022,851	2,129,058	2,236,749	2,330,259	2,425,859
No. of birth	69,977	70,931	75,490	78,408	75,118	80,111	80,833	81,778	81,013	79,410
No. of death	11,136	10,395	11,344	11,105	12,398	11,377	11,851	11,979	11,753	12,058
Birth rate	43.86	42.43	42.93	42.28	38.90	39.60	37.97	36.56	34.77	32.73
Death rate	6.98	6.22	6.45	5.99	6.42	5.62	5.59	5.36	5.04	4.97
Natural increase	36.88	36.21	36.48	36.29	32.48	33.98	32.38	31.20	29.73	27.76
3. Townships										
Total population	6,842,614	7,077,446	7,319,356	7,535,874	7,758,986	8,016,584	8,302,283	8,555,453	8,818,880	9,085,869
No. of birth	304,559	312,643	328,193	335,628	319,762	330,774	340,625	337,664	339,241	344,059
No. of death	66,942	59,786	65,241	62,970	68,316	63,364	62,201	61,736	62,070	60,853
Birth rate	44.51	44.17	44.84	44.54	41.21	41.26	41.03	39.47	38.47	37.87
Death rate	9.78	8.45	8.91	8.36	8.80	7.90	7.49	7.22	7.04	6.70
Natural increase	34.73	35.72	35.93	36.18	32.41	33.36	33.54	32.25	31.43	31.17

#Including Keelung, Taipei, Taichung, Tainan and Kaohsiung Cities

Table 5. Population, by Level of Education, 1947–1962
(6 years old and over) Unit: person

Year	Total	Received Education				Illiterate
		Sub-total	Higher education	Middle school	Primary education	
1947	5,348,489	2,740,997	26,690	232,757	2,481,550	2,907,492
1948	5,602,263	3,009,242	37,169	291,489	2,680,584	2,593,021
1949	6,082,609	3,403,115	68,427	430,404	2,904,284	2,679,494
1950	6,146,917	3,442,683	75,409	464,639	2,902,635	2,704,234
1951	6,273,116	3,548,769	83,353	527,161	2,938,255	2,724,347
1952	6,384,220	3,693,865	86,048	563,803	3,044,014	2,690,355
1953	6,567,118	3,841,183	89,894	589,839	3,161,450	2,725,935
1954	6,765,958	4,079,477	109,064	629,027	3,341,386	2,686,481
1955	7,003,230	4,347,814	116,003	671,667	3,560,144	2,655,416
1956	7,226,804	4,544,077	120,166	691,556	3,732,355	2,682,727
1957	7,510,961	5,086,903	133,499	809,744	4,143,660	2,424,058
1958	7,821,654	5,404,334	138,873	878,285	4,387,176	2,417,320
1959	8,164,778	5,804,190	148,463	956,442	4,699,285	2,360,588
1960	8,487,133	6,186,509	160,213	1,046,481	4,979,815	2,300,624
1961	8,828,398	6,544,746	172,470	1,147,316	5,224,960	2,283,652
1962	9,174,688	6,898,412	185,645	1,253,412	5,459,355	2,276,276

Source: Household Registration Statistics of Taiwan,
Department of Civil Affairs, Taiwan Provincial Government

Table 6. Movement of Population by Prefecture and City, 1951–1962

Unit: Person

Year	In-migrants					Out-migrants				
	Total	From other prefecture	From other province	From foreign country	Not reported 1/	Total	To other prefecture	To other province	To foreign country	Not reported 2/
1951	431,558	362,713	45,396	679	21,770	412,834	367,617	8,897	261	36,059
1952	411,637	359,871	27,381	1,168	23,217	446,381	381,442	6,123	648	58,168
1953	394,857	342,791	11,482	7,582	33,002	382,463	348,049	1,547	967	31,900
1954	379,823	337,356	4,774	7,390	30,303	382,990	343,092	309	1,107	38,482
1955	422,813	340,243	21,908	4,964	55,698	424,597	345,575	274	1,406	77,342
1956	526,548	418,853	7,304	4,433	95,958	556,411	425,876	619	1,632	128,284
1957	462,116	375,046	2,594	5,044	79,432	475,889	375,852	513	1,811	97,713
1958	484,841	373,233	7,993	5,739	97,876	474,576	369,721	441	1,932	102,482
1959	538,650	390,064	5,430	4,057	139,099	498,016	387,049	1,684	2,090	107,193
1960	541,891	415,894	2,789	4,960	118,248	527,489	418,278	2,513	2,290	104,408
1961	512,829	389,182	1,636	5,927	116,084	496,525	395,745	1,142	3,040	96,598
1962	561,175	431,940	1,337	5,254	122,644	548,633	431,221	679	4,281	112,452

1. Including registration allowed for net registered inhabitants, for nationalized aliens, and for permits cancelled for persons not going away, etc.

2. Including cancellation of registration overlapped, non-existing persons, whereabouts – unknown persons, departure for military service, etc.

Source: Taiwan Statistical Abstract, No. 22, P. 24, Bureau of Accounting and Statistics, Provincial Government of Taiwan, China

Table 7. Education of Farm Population
by Land Ownership and Farm Size
1955 & 1960 Agricultural Census

Unit: Person

	1955						1960					
	Number of persons			Average per 1,000 households			Number of persons			Average per 1,000 households		
	Total	Graduated from agric. schools	Graduated from high schools	Total	Graduated from agric. schools	Graduated from high schools	Total	Graduated from agric. schools	Graduated from high schools	Total	Graduated from agric. schools	Graduated from high schools
1. Classified by Tenure:												
Total	50,313	14,886	35,427	68	20	48	144,746	19,772	124,974	179	24	155
Full-owner	34,846	10,096	24,750	80	23	57	98,168	14,260	83,908	189	27	162
Part owner	9,362	3,431	5,931	55	20	35	28,271	3,849	24,422	184	25	159
Tenant	4,935	1,277	3,658	37	10	27	10,471	1,072	9,399	101	10	91
Non-cultivator	1,170	82	1,088	221	15	206	7,836	591	7,245	260	20	240
2. Classified by Size of Cultivated Land:												
Total	50,313	14,886	35,427	68	20	48	144,746	19,772	124,974	179	24	155
Non-cultivator	1,170	82	1,088	221	15	206	7,836	591	7,245	260	20	240
Less than 0.5 ha.	13,267	3,033	10,234	52	12	40	32,229	3,709	28,520	113	13	100
0.5–1.0 ha.	10,141	2,977	7,164	48	14	34	34,914	4,750	30,164	154	21	133
1.0–1.5 ha.	7,212	2,484	4,728	59	20	39	24,352	3,568	20,784	201	29	172
1.5–2.0 ha.	6,120	2,032	4,088	91	30	61	16,495	2,726	13,769	249	41	208
More than 2.0 ha.	12,403	4,278	8,125	144	50	94	28,920	4,428	24,492	372	57	315

Source : Agricultural Census, 1955 and 1960.

Table 8. Ratio of Employment in Total Population, 1949-1962

Year	Total (Total population = 100)	Agriculture (Agri. population = 100)
1949	38.23	45.70
1950	37.71	44.72
1951	36.61	42.90
1952	36.12	42.09
1953	35.01	41.35
1954	34.28	40.34
1955	33.33	39.36
1956	32.11	38.44
1957	32.09	37.79
1958	31.65	37.14
1959	31.37	37.24
1960	30.98	34.93
1961	30.75	34.97
1962	30.43	35.00

Source: The Household Registration Year Book PDCA

Table 9. Agricultural Population Classified by Type of Work

	1955		1960	
	Total Number	Average per Household	Total Number	Average per Household
Operator	1,161,829	1.56	1,384,035	1.71
Helper	1,003,355	1.35	885,893	1.10
Persons on Other Occupation	151,010	0.20	174,810	0.22
Others	2,911,181	3.92	3,418,643	4.28
Total	5,227,375	7.03	5,863,381	7.26

Source: Agricultural Census, 1955 and 1960.

Table 10. Working Days of Human Labor and Cattle Power per Hectare of Rice (1950–1963)

Year	Human labor		Cattle power	
	1st crop	2nd crop	1st crop	2nd crop
	days	days	days	days
1950	96.70	88.53	17.80	13.37
1951	95.81	90.92	16.52	13.40
1952	97.78	92.86	17.30	13.30
1953	97.47	94.06	17.13	13.22
1954	98.36	94.99	16.66	13.33
1955	106.02	95.99	16.35	13.03
1956	102.33	96.61	16.49	13.15
1957	104.18	99.09	16.77	13.26
1958	104.50	97.33	16.26	12.94
1959	105.60	97.52	15.87	12.97
1960	104.79	97.95	15.24	12.57
1961	103.25	97.45	14.74	12.12
1962	105.57	100.13	14.39	11.90
1963	107.39	100.01	14.05	11.82

Source: Data from Provincial Food Bureau

Table 11. Index Numbers of Wage & Cost-of-living, 1952–1962

1953=100

Yoar	Wage Indices				Cost of Living Index
	Agriculture	Mining	Manufacturing	Electricity & gas	
1952	73.0	37.8	80.1	57.3	76.9
1953	100.0	100.0	100.0	100.0	100.0
1954	105.2	104.7	111.3	102.8	100.5
1955	107.2	130.6	125.2	115.1	111.8
1956	118.5	173.9	141.2	123.8	121.8
1957	134.7	226.7	155.0	133.5	131.5
1958	151.9	243.0	164.6	133.1	135.0
1959	168.9	246.4	176.8	133.4	146.7
1960	214.1	270.6	207.1	168.9	176.1
1961	238.8	299.4	251.8	226.8	187.2
1962	252.6	319.7	265.0	231.3	191.9

Source: Industry of Free China

Index number of agricultural wage is computed by Rural Economics Division based on data in "Production Costs of Paddy Rice", published by PFB.

Cost of Living Index was computed by AID/C from 1952 to 1961, while 1962 figure was quoted from BAS, PGT.