

## Family-run Enterprises: An Overview of Agriculture and Fisheries

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After the difficult years of reconstruction following the defeat in the Second World War, Japanese capitalism entered a period of rapid economic growth beginning in about 1955. The economy, centred on the heavy and chemical industries, expanded and productivity increased dramatically. Japan emerged from the desolation and deprivation of a defeated nation to become one of the world's leading industrial powers. This rapid development stimulated brisk growth in the numbers of workers employed in capital-based companies, and paralleling this growth, the number of employees in family enterprises dropped sharply, and this sector lost its predominant position among the working population. The large-scale enterprises pushed aside family-run businesses and made it difficult for them to secure labour.

These historical factors provide the background to the discussion in this chapter. The introduction of technological changes in family enterprises occurred in response to the depletion and ageing of labour resources under conditions of economic growth. Agriculture and fisheries, the most important types of family enterprise in Japan, have strong market limitations. In these areas, new technologies are linked not so much to increased output as to filling the gaps left by fewer and older workers.

Changes in employment conditions vary greatly for men and women in family-run businesses. In general, women (particularly those who are married) are bound to domestic and child-raising duties. This means that the trend toward work in family-run enterprise is stronger among women than among men. Whether or not that trend manifests itself or not depends on the particular conditions of owner-managed businesses, and here agriculture and fisheries show contrasting trends. To oversimplify the matter drastically, in agriculture there tends to be an exodus of men, with women left to assume responsibility for the majority of the work, while in fishing men remain indispensable for the work on the boats, forestalling a similar pattern. Comparisons of this kind are helpful in this study of the response of family enterprises to the expansion of the labour market and technological change.

Because agriculture exhibits relatively straightforward patterns of change and has been the subject of many previous surveys and studies, this sector will be touched on only briefly; the bulk of the chapter describes owner-managed fishery concerns.

## I. Changes in the the Agricultural and Fisheries Industries and Patterns of Employment<sup>1</sup>

Two new features defined conditions in the agricultural and fisheries industries during the early post-war reconstruction period. First, as a result of demobilization and the destruction of the economic infrastructure, the former inhabitants of farming and fishing villages returned in huge numbers, creating a massive oversupply of labour. Returnees included kin who had left rural areas to work in the cities or in occupied territories overseas or to enter the military forces. Most took up farming or fishing while they waited for employment opportunities to revive. Second, (Occupation-led) agricultural land reform and reform of fisheries were undertaken in order to enable families to achieve economic independence through their own labour. These trends coincided with the promulgation of Japan's new Constitution and the setting up of labour laws. The net result was a shift away from hierarchical and communal restrictions and the development of conditions that allowed for individual management decisions.

Subsequent rapid expansion in the labour market led naturally to a flow of labour resources away from agriculture and fisheries, as people compared the income from family enterprises with the higher levels possible in other jobs. The first to leave the agricultural and fisheries labour force were the male kin who had represented excess labour. The period of rapid economic growth that began in earnest around 1960 attracted even sons who were in direct line to inherit family businesses, and this outflow occurred in both farming and fishing villages. This demographic trend differed only in specifics: whether workers continued to live in the village and commute to their urban jobs or whether they moved completely out of the villages; whether they were new university graduates, mature adults, or older people; and whether they were male or female.

The impact of this exodus of labour varied considerably between the agricultural and fisheries industries. (Differences can even be detected in different agricultural and fishery activities.) As the number of agricultural workers dropped sharply and the number of farming families decreased, it became increasingly common for workers to hold full-time jobs as well as manage the family business (table 4.1).

A small number of full-time farming households are large-scale agricultural concerns or are made up of elderly persons with no opportunities for other employment. In fisheries, small operations in which fishing is a secondary activity tend to be abandoned, and there is a parallel move away from farming, once the main source of secondary income for fishermen. This has

Table 4.1. Farming Families and Fluctuations in Income Composition, 1955-1980

	1955	1960	1965	1970	1975	1980
Total no. of farming families (thousands)	6,043	6,057	5,665	5,402	4,953	4,661
Composition by income source						
Full-time <sup>a</sup>	34.9	34.3	21.5	15.6	12.4	13.4
Type 1 <sup>b</sup>	37.6	33.6	36.7	33.6	25.4	21.5
Type 2 <sup>c</sup>	27.5	32.1	41.7	50.8	62.1	65.1

- a. "Full-time" indicates farming households with no members who work part-time or full-time in other jobs.
- b. "Type 1" indicates households in which income from the family-owned or managed farm is higher than that from other jobs.
- c. "Type 2" indicates households in which income from family-owned or managed farm is less than that from other jobs.

Source: Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries, *Nōgyō sensasu* [Agricultural Census].

Table 4.2. Owner-managed Fishing Businesses and Composition by Income Source, 1953-1978<sup>a</sup>

	1953 <sup>b</sup>	1963	1968	1973	1978
Total (households)	235,761	262,518	248,323	224,968	210,123
Composition by income source					
Full-time	14.3	15.9	20.2	21.6	25.5
Type 1	43.0	51.5	45.5	45.5	42.8
Type 2	42.7	32.7	34.4	32.9	31.8

- a. "Owner-managed fishing businesses" refers to households engaged in fishing for the purpose of sale and spending a minimum of 30 days per year at sea.
- b. The total for 1953 does not include owner-managed businesses that did not use fishing vessels. The higher totals for other years include such businesses.

Source: Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries, *Gyogyō sensasu* [Fisheries Census].

strengthened the position of families engaged solely in fishing. The result is that roughly 70 per cent of fishing families gain their income either solely from fishing or *mainly* from fishing (table 4.2).

The economic situation of households at each stratum by scale of business corresponds to this spread of income sources. The share of farm-generated income in farming families drops noticeably in each stratum. The families in the lowest stratum, those operating the 70 per cent of farms throughout Japan (excluding Hokkaido) that are under one hectare in area, depend on

Table 4.3. Degree of Dependence on Farm Income (farm families, by size of operation, 1950–1980) (percentages)

Size	1950	1960	1970	1980	Percentage of farm families
Less than					
0.5 ha	40.5	21.4	9.3	3.3	42.3
0.5–	66.9	52.0	29.0	13.4	28.7
1.0–	78.5	72.0	51.6	29.4	14.4
1.5–	85.5	79.4	65.8	42.2	7.2
2.0–	89.0	87.3	77.4	61.1	7.4
Average for all strata	67.5	52.2	35.0	20.0	100.0

Source: Dependence on farm income is extracted from Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries, *Nōka keizai chōsa hōkoku* [Report on Surveys of the Economic Situation in Farming Families]. Break-down of families based on Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries, *Nōgyō sensasu* [Agricultural Census].

farming for only 10 to 20 per cent of their income (table 4.3). By contrast, fishing families of the lowest stratum, those using power-engine driven boats of less than one ton, derive more than 40 per cent of their income from fishing (table 4.4).

The contrasts discussed above are a result of the different ways family-run businesses in these two sectors perform under capitalism. The vulnerability of family-run agricultural operations is immediately apparent, while in fisheries the peculiar characteristics of the industry tend to suppress the emergence of weaknesses. Here, let us look at the conditions that sustain the predominance of single-occupation fishing operations among coastal families.

First are the peculiarities of the labour involved in fishing. While it is relatively easy for farmers to incorporate agricultural tasks into gaps in the schedule of non-farm work, fishermen labour under time restraints imposed by external factors, namely the behaviour of their catch. Fish that are attracted to light, for example, have to be caught at night. The physical demands of long periods of continuous work at sea also limit labour patterns in the fisheries sector. With current levels of technology, only men are able to perform the tasks required of fishing (although women often work in auxiliary roles on fishing vessels as part of husband-and-wife teams.). Owner-managed coastal fishing operations must therefore employ at least one male, and this requirement effectively prevents the head of a fishing household from also taking a non-fishing job,<sup>2</sup> leading to the preponderance of single-occupation specialization in this sector.

Second, as reflected in the fact that the main industry on remote islands is fishing, the development of the labour market in coastal fishing villages is

Table 4.4. Degree of Dependence of Fishing Income (fishing families, by size of fishing vessel, 1951-1980) (percentages)

	1951	1962	1970	1980
Non-power-driven vessels	50.4	34.9	21.7	—
Under 3 tons <sup>a</sup>	71.6	62.6	66.5	—
Under 1 ton	—	—	50.0	41.2
1-3 tons	—	—	67.0	49.1
3-5 tons	76.6	62.8	79.4	64.9
5-10 tons	84.8	55.0	87.1	69.6
Laver ( <i>nori</i> ) cultivation	52.4	57.2	68.1	54.3

a. Tonnage figures used for ranking refer to total tonnage of vessels used by each business.

Source: Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries, *Gyogyō keizai chōsa hōkoku (Gyōka no bu)* [Survey Report on the Fisheries Economy (Section on Fishing Households)].

comparatively much slower than for the average agricultural village. This slow development means there are few opportunities for wage-based employment in these areas, so that those who wish to become wage-earners must leave the villages. Young people responsible for carrying on a family business, however, cannot leave.

Third, although technological development has occurred in navigation and fishing, what advances have been made have not led, as in agriculture, to increased productivity. Unchanging productivity has meant higher unit prices. Undeniably, the total catch by the Japanese fisheries industry has risen from about 4 million tons before the Second World War (during the 1930s) to 10 million tons in the years since 1970. The source of this growth, however, is mostly catch (destined as animal feed and processed fish products) taken by larger, capital-based enterprises operating in distant and offshore fishing grounds. The size of catches by coastal fishing families has remained constant at around 2 million tons. The high component of high-value, fresh fish in this coastal catch, combined with the rising purchasing power of Japanese consumers resulting from economic growth, has secured a sound income for coastal fishing families as prices for their produce have risen.

Thus, while seeking secondary sources of income has not been a feasible option for fishing households, they have enjoyed economic conditions that have made it possible to earn a satisfactory living from fishing alone. Consequently the joint pursuit of fishery with wage-based jobs has been much slower to develop among people engaged in the fishing industry than among those in agriculture.

Table 4.5. Employment of Farming Household Members, 1960–1980

	Family members over 16 yrs (thousands)	Components (%)				
		Members working on family farm			Members in non-farm jobs only	Members not working
		Total	(Share working principally farm jobs) <sup>a</sup>			
<b>Men</b>						
1960	10,694	79.5	51.8	10.9	9.6	
1965	9,816	76.3	42.6	12.1	11.6	
1970	9,347	81.3	34.5	9.2	9.5	
1975	8,575	79.4	25.4	9.4	11.2	
1980	8,228	78.1	24.7	10.5	11.4	
<b>Women</b>						
1960	11,683	78.1	52.3	5.2	16.7	
1965	10,783	73.8	44.1	7.1	19.1	
1970	10,267	76.7	37.3	6.7	16.6	
1975	9,350	72.7	27.5	7.3	20.0	
1980	8,859	69.0	23.6	9.1	21.9	

a. "Share principally working in farm jobs" refers to family members who usually work and for whom the principal content of their job is farm tasks.

Source: *Nōgyō sensasu* [Agricultural Census].

Let us now consider the employment situation in farming and fishing families. As indicated in table 4.5, the percentage of male and female family members engaged principally in farm tasks fell, reaching almost 20 per cent in 1980. None the less, men involved to some extent, however small, in farm tasks account for 80 per cent of the total, and women 70 per cent. The technological advances in agriculture have not severed the link between farming family members and farm tasks, but they have diminished the degree to which family members are exclusively involved in farm tasks.

Of course, the degree of involvement varies with the age of the family member. As shown in table 4.6, the share of male family members engaged principally in farm tasks only exceeds the share engaged primarily in non-farm tasks at ages 60 and over. The pattern for women is different. Many female family members in their twenties work outside agriculture, but the share of females engaged principally in farm tasks begins rising in the late twenties. By their forties, more women are working principally in agriculture than are not. At all ages up to 60, with the exception of groups under the age of 25 (when women hold full-time salaried jobs before marriage and childbirth), the number of female family members engaged exclusively in agriculture far outnumbers the number of men.

Table 4.6. Employment Situation of Farm Family Members by Age-group (for 1980)

Age (years)	Members working only on family farm	Members working on family farm and in non-farm job		Members working only in non-farm job	Members not working in a job
		Members for whom family farm is main occupation	Other job is main occupation		
<b>Men</b>					
16	21.0	0.3	7.7	8.1	62.9
20-	10.6	2.1	42.4	32.3	12.7
25-	9.2	3.8	57.6	28.0	1.5
30-	10.7	5.5	64.7	18.0	1.0
35-	12.3	7.9	68.0	10.9	0.9
40-	15.4	11.0	66.1	6.8	0.8
45-	18.2	12.6	63.5	4.9	0.9
50-	22.7	12.9	59.0	4.2	1.1
55-	29.9	12.6	51.9	3.8	1.9
60-	45.3	10.6	37.0	3.0	4.1
65-	57.2	7.5	23.7	2.7	8.9
70-	52.3	2.4	6.7	1.6	37.0
Total	25.1	7.4	45.6	10.5	11.4
<b>Women</b>					
16	14.5	0.0	4.0	9.7	71.8
20-	11.7	0.4	24.0	46.7	17.2
25-	31.8	1.5	25.2	24.9	16.6
30-	41.3	3.5	29.7	13.2	12.3
35-	42.8	6.5	36.9	7.8	6.0
40-	43.7	8.6	39.2	4.9	3.6
45-	49.9	8.3	35.2	3.5	3.2
50-	59.8	6.6	26.5	2.7	4.4
55-	66.6	4.8	18.9	2.3	7.4
60-	70.4	3.0	10.9	1.8	13.9
65-	66.1	1.6	5.5	1.4	25.4
70-	35.4	0.4	1.1	0.6	62.5
Total	44.8	3.7	20.5	9.1	21.9

Source: *Nōgyō sensasu* [Agricultural Census].

These statistics give a general picture of the average employment situation for members of farming families. Older members and women perform the routine farm work. Men of mature age employed in non-farm jobs assist with farm tasks in a supplementary role. These men carry the principal burden for their families' livelihoods and work mostly in cyclical or seasonal

Table 4.7. Proportion of Fishing Family Members Employed in Family Business by Age, 1963 and 1978

Age (years)	Men				Women			
	Members over 15 yrs (A)		Members employed in family fishing business <sup>a</sup>		Members over 15 yrs (C)		Members employed in family fishing business <sup>a</sup>	
	Number (B)	%	$\frac{B}{A}$ (%)	%	Number (D)	%	$\frac{D}{C}$ (%)	
1963								
15-	58,954	4.7	27.2		2,429	2.8	4.5	
20-	100,942	17.9	60.4		17,367	19.8	18.1	
30-	100,730	25.1	84.7		28,161	32.1	28.7	
40-	66,333	17.7	90.7		20,558	23.4	26.7	
50-	69,058	17.9	88.1		12,781	14.6	17.4	
60-	95,942	16.8	59.4		6,467	7.4	6.9	
Total	491,959	100.0	69.2		87,763	100.0	17.8	
1978								
15-	43,876	2.0	10.7		313	0.4	0.8	
20-	33,158	4.7	33.6		1,327	1.8	4.6	
25-	32,978	6.5	47.0		3,751	5.0	14.1	
30-	23,560	6.1	62.1		22,897	8.0	26.4	
35-	24,206	7.8	77.2		29,700	13.9	35.3	
40-	35,468	12.8	86.0		37,479	14.04	18.6	
45-	42,486	15.8	89.1		38,261	18.5	36.5	
50-	36,625	13.8	90.0		35,210	14.7	31.5	
55-	24,628	9.2	89.6		28,488	9.4	24.9	
60-	22,881	8.2	85.6		23,722	5.1	16.2	
65-	56,589	13.2	55.8		63,641	4.8	5.7	
Total	376,455	100.0	63.5		375,330	100.0	20.1	

a. "Family members employed in family fishing business" refers to persons working for more than 30 days annually at sea in the family-run fishing business, and does not indicate whether the family fishing business or some other job is that person's principal occupation.  
Source: *Gyogyó sensasú* [Fisheries Census].

wage-based jobs. As they grow older, management of their own farm becomes their principal occupation again for a time before retirement.

The situation in fishing families is similarly described in table 4.7. Note that the statistics are based on persons who spend more than 30 days annually at sea working to support their own fishing business.

Table 4.7 displays several features of persons employed in fishing tasks at sea. In the first place, men far outnumber women. More than 60 per cent of male family members participate in fishing tasks, compared to only 20 per cent for females. Those ratios changed noticeably, however, between 1963 and 1978, declining for men by 6 per cent and increasing for women by 2 per cent.

Meanwhile, there has been a decline in the number of both men and women working in the fisheries sector since the rapid economic growth period began. Paralleling the relative increase in the share of fishing tasks performed by women, as noted above, this drop in total numbers is pronounced among men, while the relative share of women in the total fishing labour force has risen. (During the period of this study, the rate of decline in the number of men was 29.7 per cent and in the number of women 13.8 per cent.)

A fourth feature observable in table 4.7 concerns the shares of different age-groups in fisheries among family members. More than half of all male family members over the age of 30 are engaged in fishing tasks, with peaks of around 90 per cent for those in their forties and fifties. The proportion of female family members is between 20 and 30 per cent for those in their thirties, forties, and fifties. Participation by women of all other ages drops off dramatically. The figures in table 4.7 also suggest that a large number of men in their twenties are employed outside the fisheries sector and that this tendency has grown even stronger, while women before marriage and of childbearing age take almost no role in fishing tasks at sea, and the age of retirement is low.

The share of different age-groups in the fishing labour force shows a marked trend between the years 1963 and 1978 toward a higher median age. During this period, the proportion of men over 50 in the total number of male family members employed in family-run fishing businesses rose from 34.7 to 44.4 per cent, and of women of the same age from 22.0 to 34.0 per cent. The percentage of men over 40 jumped from 52.4 to 73.0 per cent, and of women from 45.5 to 71.1 per cent.

Table 4.8 shows the proportions of fishing family members by their principal form of employment. Although the number of both men and women whose principal occupation is in the fisheries sector (sea-based) is fewer than the number of people engaged in fisheries tasks at sea for more than 30 days annually (see table 4.7), the difference is not large. In fact, more than 80 per cent of the latter group make fishing their principal occupation. In the broadest terms, then, we can say that persons engaged in fisheries tasks at sea make such tasks their principal occupation. A second feature to be observed in table 4.8 is the large number of women not engaged in fisheries

tasks at sea but performing related shore-based tasks. The combined total of women in their thirties, forties, and fifties who work either in fisheries tasks at sea or in related shore-based tasks equals roughly half of all female family members.

Principal employment in non-fisheries-related occupations is concentrated among younger age-groups, particularly men in their twenties and women in their early twenties. Only a few men begin working in the fisheries sector after graduating from high school. The majority of young men take a wage-based job before joining the family fishing business when the head of the family is ageing. Likewise, few young women work in the business of their natural family before marriage. In general, a job in a company will precede marriage.

The data lead to the conclusion that the shift of young people to employment outside family-run fishing businesses has created a high median age and a constant increase in the percentage of women in this sector. At the same time, however, family members with their own fishing businesses display a strong tendency to continue fishing as their principal occupation.

The changes in employment patterns outlined above are reflected in the gradual change in the division of labour within families. In the immediate post-war period, two generations of males and several close male relatives would perform the tasks at sea, while women and older persons handled related on-shore jobs related to fisheries and/or farming. Today, the male head of the family or a husband-and-wife team performs tasks at sea. The family's male heirs follow wage-based jobs until a certain age; daughters take part-time jobs and at the same time contribute to the family's business in some way. The large size and mechanization of fishing vessels and their on-board equipment have reduced the number of workers needed at sea, and have permitted older men and women to perform tasks at sea. These factors are the same as those prevailing in the agricultural sector.

Responding to these developments, cooperative movement activity sustained by men in the prime of their lives and enthusiastic about owner-management of farm and fishing businesses has changed greatly under Japan's post-war democratic development. In farming, the majority of mature males have moved into non-farm jobs, with the result that decision-making in agricultural cooperatives has come to be concentrated in fewer hands (active farmers and coop employees). The limited advance of women into the management of cooperatives has not offset the heightening of this concentration. In fishermen's cooperatives, on the other hand, there has been a rise in the median age of members, but the high rate of participation by middle-aged men has resulted in greater membership authority than that in agricultural cooperatives.

The discussion above provides the fundamental economic details of transformed agriculture and fisheries in Japan during the rapid economic growth period. The following section outlines how the similarities and differences in the changes in these two sectors were related to their patterns of technological innovation.

Table 4.8. Principal Occupations of Fishing Family Members by Age-group, 1978 (percentages)<sup>a</sup>

Age (years)	Self-employed										Employees				
	Total	Fisheries					Agriculture	Other sector	Fisheries			Not employed			
		Subtotal	Sea-based	Shore-based	Sea-based	Shore-based			Subtotal	Fisheries	Non-fisheries				
<b>Men</b>															
15-	27.5	13.8	10.3	1.9	0.7	0.9	13.8	3.3	10.5	72.5					
20-	88.8	35.0	28.7	0.9	2.0	3.5	53.8	9.7	44.1	11.2					
25-	97.0	47.5	38.9	0.7	2.7	5.2	49.5	9.9	39.6	3.0					
30-	98.4	60.6	50.1	0.7	3.6	6.3	37.8	8.1	29.7	1.6					
35-	99.2	72.4	62.6	0.5	3.9	5.4	26.8	7.6	19.2	0.8					
40-	99.4	80.4	70.6	0.5	4.9	4.4	19.1	5.9	13.2	0.6					
45-	99.7	82.9	72.5	0.6	5.6	4.2	16.7	5.0	11.7	0.3					
50-	99.4	84.5	72.7	1.2	6.4	4.2	14.9	4.0	10.9	0.6					
55-	99.0	85.9	71.4	1.7	8.2	4.6	13.1	3.4	9.7	1.0					
60-	97.5	87.5	70.0	3.5	9.3	4.6	10.0	3.0	7.0	2.5					
65-	76.4	72.5	48.1	10.3	10.5	3.5	3.9	1.2	2.7	23.6					
Total	86.2	64.3	52.4	2.5	5.4	4.0	22.0	5.2	16.8	13.8					
<b>Women</b>															
15-	18.6	6.5	0.7	4.1	0.6	0.9	12.1	0.1	12.1	81.4					
20-	76.1	22.5	4.0	10.9	3.3	4.3	53.7	0.3	53.3	23.9					
25-	77.3	49.2	12.5	21.2	8.5	7.0	28.1	0.7	27.4	22.7					
30-	82.0	63.7	23.1	22.4	10.3	7.9	18.3	1.2	17.1	18.0					
35-	87.6	69.5	29.7	20.7	11.4	7.9	18.0	1.3	16.7	12.4					

40-	89.4	71.8	30.7	20.0	13.4	7.7	17.7	1.3	16.4	10.6
45-	88.8	73.2	29.2	20.6	15.6	7.9	15.6	1.1	14.5	11.2
50-	86.9	73.7	24.9	23.4	17.4	8.1	13.2	1.0	12.2	13.1
55-	82.9	72.6	19.3	25.7	19.6	8.0	10.3	0.9	9.3	17.1
60-	74.5	68.3	12.3	27.9	21.2	6.7	6.2	0.7	5.5	25.5
65-	42.8	41.1	4.3	18.5	14.5	3.7	1.8	0.2	1.5	57.2
Total	69.7	53.6	16.4	18.9	12.3	6.0	16.0	0.8	15.3	30.3

a. Figures show the percentage of the total number of persons in each age-group.

Source: *Gyogyō sensasu* [Fisheries Census].

## II. The Effects of Technological Change

### 1. Agriculture

Technological innovation has developed in many aspects of agriculture, but nowhere more than in the labour-saving technology for rice cultivation. Rice yield has risen spectacularly from an annual tonnage of 10 million to 14 million. This is the result of dramatic reductions in labour requirements and a large rise in the productivity of the land. A great variety of technological advances lies behind these trends: improvement in soils, better irrigation, improved seed types, widespread use of pesticides, and greater use of fertilizers and mechanized equipment. In this section we will examine the relationship between this technological progress and the changes that have taken place in agricultural labour and economic patterns.

Table 4.9 shows that the time per 10-are plot required for the principal tasks of rice cultivation has markedly declined. Some difference is evident in the timing of this decline for particular tasks. The time needed for preparing fields for planting, and for irrigation and related tasks, dropped in the 1950s and early 1960s; that for planting, harvesting, and threshing in the late 1960s and after. The former period corresponds to the spread of powered ploughs, tractors, and irrigation pumps, the latter to the spread of rice-planting machines, harvesters, and combines.

Men are the principal operators of agricultural machinery. The general trend for men to undertake non-farm jobs jointly with their farm tasks has led to an increase in the number of women who operate farm machinery,

Table 4.9. Time Devoted to Rice Cultivation (per 10-are plot, 1952, 1965, 1975)

Area under cultivation	Year	Time spent on principal labour					
		Total labour time	Ploughing, raking	Planting	Weeding	Irrigation and related tasks	Harvesting and threshing
Average	1952	196.1	28.9	27.6	35.7	18.5	59.3
	1965	141.2	14.2	24.4	17.4	12.0	47.9
	1975	81.5	9.2	12.2	8.4	9.9	21.8
30-50 ares	1952	226.0	33.1	32.7	37.8	26.8	66.0
	1965	156.2	16.3	27.3	17.0	14.3	51.8
	1975	107.8	12.5	16.7	9.5	13.6	31.9
3 ha and over	1952	159.1	18.7	20.5	38.4	9.6	49.5
	1965	117.0	6.9	21.6	21.6	7.8	38.9
	1975	55.4	4.3	9.3	8.4	6.4	11.1

Source: Nōsei Chōsa Inkaï [Agricultural Policy Study Committee] supervised by Kayō Nobufumi, *Kaitei Nippon nōgyō kiso tōkei* [Revised Basic Statistics on Japanese Agriculture], pp. 488-489.

Table 4.10. Rate of Farm Expenses by Size of Farm, 1950–1980<sup>a</sup>

Area	Year	Gross farm income (unit: 1,000 yen)	Farm expenses (unit: 1,000 yen)	$\frac{B}{A}$ (%)
Average for all farms	1950	189	46	24.3
	1960	342	129	37.6
	1970	937	450	48.1
	1980	2,275	1,370	60.2
Farms with less than 0.5 ha under cultivation	1950	75	19	25.6
	1960	137	57	41.6
	1970	275	149	54.0
	1980	558	408	73.1
Farms with less than 2.0 ha under cultivation	1950	406	102	25.1
	1960	946	339	35.8
	1970	2,287	999	43.7
	1980	6,619	3,785	57.2

a. These figures do not include those for farms in Hokkaido.

Source: *Nōka keizai chōsa* [Survey of Farming Family Economic Status].

but the prevalence of men in dealing with this task continues. The need for flexibility in performing farming tasks among men with commitments to non-farm jobs has led to a spread in individual ownership of machinery instead of joint use of machinery.

The mechanization of rice cultivation, together with the shift from self-supplied to purchased fertilizer, has contributed to a large rise in expenses. As shown in table 4.10, between 1950 and 1980 the ratio of farm expenses to gross farm income leapt from 24 to 60 per cent. The need to pay for machinery and fertilizer has severely limited the increase in net farm income.

Naturally, the above trend varies considerably with area under cultivation. Table 4.9 shows clearly that the labour time required per unit of land falls as the area under cultivation increases, and rises as that area decreases. It is also possible to infer from table 4.10 that expenses as a share of gross farm income decline in proportion to the area under cultivation.

Technological progress has eliminated the excessive labour of the high season for most farmers, and has allowed members of farming families to hold regular wage-based jobs. In fact, the low income generated by rice cultivation and the high costs of mechanization have heightened the need to hold a non-farm job. On the other hand, for the minority of large-scale rice-cultivators, technological advances have offered the potential to secure the income necessary to boost labour productivity to a far higher level than is possible on small farming units.

In running the majority of Japan's farms, women and older people now

play the central role, while the few large-scale farms that exist are mainly run by middle-aged men. These men have expanded their operating base by renting land owned by others or by accepting commissions to cultivate separately owned land. Such expansionary trends face limitations imposed by rising land prices, however, and will not be able to eliminate small farming units through absorption in the foreseeable future.

A schematic description of the relationship between the employment patterns of members of farming families and the size of family-run farms shows three basic elements:

1. In large-scale operations, both men and women, including those in young age-groups, are centred on agriculture.
2. In medium-scale operations, men and young people are oriented toward non-farm occupations, while women and older persons are oriented to agriculture.
3. In small-scale operations, both men and women are centred on non-farm occupations.

This background illustrates the relative rise in the position of the labour of women in supporting agricultural tasks. None the less, the decline in the time required for rice cultivation has meant that female members of farming families have increasingly taken up non-farm occupations (see table 4.5). This tendency corresponds to growth in the part-time market in farming villages.

## 2. Fisheries

Technological innovation in coastal fisheries has displayed great diversity for each type of fishery activity. In the discussion below, we examine three such areas—trawling, breeding, and diving—which have shown contrasting patterns of technological change.

### (1) Trawling

Trawling technologies have advanced in such areas as fishing vessels, navigational equipment, on-board equipment, and fishing tackle. Motors have been added to vessels, reducing the physical requirements of labour. Wood has given way to reinforced plastic, encouraging standardization and improved performance and durability of vessels. More powerful engines have speeded up navigation times, expanding accessible fishing grounds and securing fresher produce. Greater power has also raised trawling capacity. Larger vessels have enhanced the safety and comfort of fishing operations, and made it possible to operate even under adverse weather conditions or for continuous periods extending over several days.

Many of the navigational aids and on-board instruments used formerly only on large, deep-sea fishing vessels or cargo vessels have appeared on coastal fishing vessels in more compact versions. Foremost among navigational aids is wireless equipment; ancillary on-board instruments include fish-school detectors and on-board equipment directly used for fishing tasks

Table 4.11. Number of Workers at Sea at Height of Fishing Season (family members and hired hands, 1953-1978)

Operating vessel	1953		1963		1978	
	Family members	Hired hands	Family members	Hired hands	Family members	Hired hands
<3	2.0	0.9	1.7	0.2	1.4	0.0
3-5 tons	1.8	4.4	1.9	1.2	1.6	0.3
5-10 tons	1.6	8.7	1.8	3.7	1.9	0.9

Source: *Gyogyō sensasu* [Fisheries Census].

includes mechanized net-haulers and automatic fishing lines. This equipment has reduced the personnel requirement for navigation and fishing, and the level of skill needed for such tasks.

In parallel with the growth in the size of vessels, fishing tackle such as nets has become larger. Net materials have switched from cotton to synthetic fibres, offering greater strength and eliminating deterioration, thereby cutting onshore repair tasks. Technological improvements such as these have permitted the participation of older persons and women in fisheries tasks by lowering the physical requirements of labour and promoting efficiency.

As mentioned earlier, these advances did not significantly alter the total volume of the coastal fisheries catch, which remained constant at around 2 million tons. This limit to the catch is beyond human control—it depends on the rate at which marine life regenerates, and is a major characteristic of the fisheries industry. Faced with this limitation, participants in the industry were forced to compete with each other for a greater share of the catch of high-value fish. This competition fuelled the rate at which technological advances were adopted in the coastal fisheries industry. Naturally, the introduction of advanced techniques and equipment increased the level of expenses relative to the size of catches.

Table 4.11 shows the decrease in the size of crews on different classes of fishing vessels. As crews grew smaller, more labourers from the fishing industry sought higher wages in shore-based industries. This process led to reorganization into family-based operations, even among the top stratum of coastal fishing families.

## (2) Marine Farming

Marine farming is an industry in which natural resources are reproduced through human management aimed at stabilization and promotion of production. It actually resembles land farming in several respects: specific areas of the sea are used exclusively for cultivation, and marine farmers have a pre-existing right of ownership of the harvest and assume the expenses of

feeding and care. The problems of marine farming also resemble those of land farming: rapid increases in yield due to technological progress can lead to a slump in prices. We will consider these matters in the context of laver (*nori*) cultivation, the most important of all marine farming activities.

Progress in laver-farming technology produced new methods of propagation, as well as work procedures in the sea and on land. The advances in propagation are central, forming the basis of advances in other areas. The principal new developments are described below:

1. The long-established method of propagation had relied on the natural adhesion of naturally produced laver spores to bamboo frames. A better understanding of the growth process of the laver seaweed led to a shift to artificially cultivated spores. This eliminated variations in yield due to inconsistent quality of seedlings, and permitted hybriding and other improvements in the quality of laver. For the first time, it became possible to cultivate laver as an agricultural product.
2. In place of bamboo frames to which the spores attach and the laver grows, special nets were adopted. These nets greatly facilitated harvesting and other seaside tasks as well as permitting more extensive cultivation. The use of bamboo limited the area of cultivation to sea depths shallower than the length of the poles (several metres). Nets, however, could be floated at any depth, eliminating this limitation. The "free-floating" method, in fact, has opened up many new areas of the sea for commercial purposes.
3. The technique of freezing the laver nets to which seaweed shoots have adhered and exchanging nets during the cultivation season (October to April) has boosted yield by permitting two or even three crops per year. Harvesting at the optimum stage of growth has also overcome the problem of deterioration in quality as the laver ages.

Statistics clearly show the rapid growth in laver output due to these technological advances. Annual output of 1 billion sheets around 1950 had risen to almost 4 billion by 1960. With the widespread use of advanced techniques by 1970, output was up to 6 billion sheets. The peak of 9.6 billion sheets recorded in 1973 led to a sharp drop in prices, and since then annual production has been held at around 8 billion sheets to support prices. Initially, rising production increased the number of laver cultivation operations, but as techniques advanced further, prices fell and costs escalated.

Older laver-producing regions were pushed out of the industry as new regions flourished using the new technologies. These developments caused smaller businesses to move away from laver cultivation. Table 4.12 indicates the rise in the number of businesses involved in laver cultivation during the 1960s, and the abrupt drop in this number after that time. This turnaround is a vivid reflection of the rapid pace of technological change just described.

The growth in production of laver naturally led to increased labour requirements for harvesting and drying, promoting in turn the development of new technologies for these operations. Manual harvesting of seabeds gave way to the use of mechanical harvesters and the introduction of vessels de-

Table 4.12. Percentage of Businesses Involved in Laver Cultivation as a Primary Activity, 1963-1978

Year	Businesses engaged in laver cultivation (A)	Businesses with laver cultivation as primary activity (B)	Ratio of $\frac{B}{A}$ (%)
1963	58,620	51,354	87.6
1968	93,569	52,644	56.3
1973	46,094	38,436	83.4
1978	29,793	24,913	83.6

Source: *Gyogyō sensus* [Fisheries Census].

signed for laver-farming. Shoreside tasks before mechanization consisted of fine-chopping of harvested laver, spreading it in thin layers on drying sheets, removing the dried laver, and bundling. Laver was sun-dried and therefore dependent on weather conditions.

Drying machines were introduced, eliminating the need to wait for good weather, and equipment gradually increased in capacity and functions until automatic drying machines appeared that integrated all steps up to the final bundling. Eventually, mechanization advanced to the extent that the harvested laver could be simply fed into a machine which turns out the finished product. Technological progress of this type is the principal factor behind the tenfold increase in output of laver over a short period. It also allowed family-run operations to establish a commercial business structure without having to acquire non-family labour.

Higher levels of technology, however, also demanded higher levels of capital investment. This need forced many operators to retire from laver cultivation. Among family operations that continued to cultivate laver, wider discrepancies arose in commercial viability and some families face continual economic difficulties.

Let us now describe the employment conditions in family laver-cultivation businesses. During the growing season from October to April, father-and-son or husband-and-wife teams work at sea, while older female family members perform shoreside tasks. The work involves long working hours over consecutive days. In the off-season, the growers prepare for the next season, and in many cases the women work in agricultural or part-time jobs, and men take work in the fishing industry. The percentage of women in laver-cultivating families who work at sea is far higher than in other branches of the fishing industry. The principal reason for this is that the work involves shorter distances from shore and less time, so that women are better able to meet the physical demands and balance the work with their domestic responsibilities.

Even when women do not take part in work at sea, they participate in shoreside tasks as a matter of course. Consequently, if we consider both the labour at sea and that on shore, we find that the majority of female members of families cultivating laver are involved in some way in the family

Table 4.13. Extent of Joint Agricultural Operations in Laver-farming Families, 1963-1978

	Year	Individual proprietorships (A)	Households with farmland		$\frac{B}{A}$ (%)	$\frac{C}{A}$ (%)
			No. (B)	$\geq 0.5$ ha (C)		
Laver-farming families <sup>a</sup>	1963	51,299	36,844	21,560	71.8	42.0
	1968	52,448	33,058	19,614	63.0	37.4
	1973	37,652	20,945	12,121	55.6	32.2
	1978	24,341	13,011	7,764	53.5	31.9
Individual proprietorships	1963	262,518	170,932	59,801	65.1	22.8
	1968	248,323	124,982	50,109	50.3	20.2
	1973	224,968	96,991	37,783	43.1	16.8
	1978	210,123	77,685	29,769	37.1	14.2

a. "Laver-farming families" refers not to all families involved in laver cultivation, but to those for which laver cultivation is the primary business. The data under "laver-farming families" in this table differ from those in table 4.12 because the latter includes businesses other than individual proprietorships (corporations and fishermen's coops).

Source: *Gyogyō sensasu* [Fisheries Census].

business. This situation means that it is difficult to secure a stable income throughout the year, and necessitates dependence on seasonal jobs with low stability. In many cases young women (daughters) engage in other industries to secure a stable income. Women of middle and advanced age are hired to replace them.

At present, a high percentage of households in the laver-cultivation sector also jointly engage in agriculture. As shown in table 4.13, only slightly more than one-third of all families in the fisheries sector engage in agriculture, but this percentage rises to over 50 per cent for laver-farming families. The percentage of such families cultivating more than 0.5 hectares of land is also higher—32 per cent, compared to 14 per cent for the fisheries sector as a whole. This is mainly due to the fact that laver-farming families engage in agriculture as a source of employment during the summer, which is the off-season for laver production. Another reason is that, in the early stage of technological advancement in laver farming, fishing families whose female members ran farms of a limited size as a family operation were able to begin cultivating laver. On the other hand, many fishing families whose female members were committed to wage-based jobs were unable to enter the laver-cultivation business.

### (3) Diving

This branch of the fisheries industry is composed of women who dive to collect stationary shellfish such as abalone. Two features distinguish this

occupation: the divers are solely women, known as *ama*, and technological progress has not led to the replacement of traditional, human skills

Technological advances in diving, including use of oxygen tanks and wet suits, have popularized it as a sport among the general populace but have not been adopted by *ama*, whose only equipment is a knife to pry shellfish from rocks. The main reason behind the failure of new technologies to appear in this branch of fishery is the slow pace of regeneration of shellfish resources. Abalone require from four to six years to grow, and any sudden increase in the amount collected would create a serious shortage in availability.

To prevent such shortages, the authorities stipulate overall general regulations, and fisheries cooperatives and the *ama* themselves abide by self-imposed restrictions. These regulations limit the diving season and the number of divers for specific zones, and as a general rule prohibit the adoption of new techniques.

Restrictions such as these run contrary to modern concepts of "freedom of enterprise," but the *ama* have strictly observed these rules and methods for hundreds of years. Furthermore, the method of passing on these specialized diving skills from one generation to the next has safeguarded the traditional rules from being infringed by outsiders.

In areas where shellfish resources exist but are not worked by traditional *ama*, permission to dive using modern equipment is accompanied by careful supervision to prevent the danger of exhausting resources by competitive operations. For example, a fisheries cooperative may be allowed to work in such a region using one diver and modern equipment, with the proviso that operations will cease should the danger of exhaustion of resources arise. The determined refusal of *ama* to adopt new techniques is a manifestation of their concern to preserve the resources, even as they compete with each other for higher catches.<sup>3</sup>

*Ama* follow two patterns when diving. They may dive alone, using a floating tub to which they cling to rest and into which they place their catch. Or they may work in a husband-and-wife team, the husband operating a boat while the wife dives. In this case, the *ama* uses weights manipulated from the boat by her husband to prolong her dive and ensure safety. These typical patterns are practised with variations in different regions.

### III. Patterns of Female Labour in Family-run Fishing Businesses

#### 1. Conditions of Female Labour

##### (1) Age

Patterns of female employment are significantly determined by age. Nowadays, it is the exception, rather than the rule, for a young woman to enter the family-run fishing business after graduation from high school or college

(with the exception of shore-based laver cultivation). Normally, young women find jobs with a company, and return to work in a family-run business only after marriage. This trend is strengthened by the desire of many young women from fishing families to live in the cities. As a consequence, the sons of family-run fishing businesses often marry women from other backgrounds who have no prior experience of fishing. For these and other reasons, young women do not contribute to the family fishing business if other stable employment opportunities exist. During their childbearing years, young married women leave their wage-based jobs and devote themselves to housework and child-raising tasks, while at the same time contributing to the family's shoreside or agricultural activities.

After young children have grown, women find it difficult to re-enter the full-time labour force, so they tend instead to move into part-time occupations in family-run fishing or farming businesses or similar jobs. More women in their thirties and forties work in agriculture than in any other sector (table 4.7). Despite advances in mechanization and technology, however, work at sea in the fishing industry is more demanding than agricultural labour, and does not offer the flexible working hours of agriculture. In regular fishing activities, once a vessel puts out to sea it will normally operate for a stretch of about eight hours. These circumstances reduce the number of women in their fifties working at sea and cause most women to retire once they reach 60 years of age. At this stage, most women will concentrate on caring for their grandchildren and helping with domestic chores, though they will still assist with shore-based fishing activities and agricultural tasks.

## (2) Composition of Households

In common with the agricultural sector, the size of fishing families has been diminishing since Japan's rapid growth period. According to the *Gyogyō keizai chōsa* [Economic Survey of the Fishing Industry], the average size of fishing families has declined from 6.8 persons in 1952 to 6.2 in 1960, 5.0 in 1970, and 4.3 in 1980. This decline is due both to families' having fewer children and to the tendency toward nuclear families. Two types of nuclear families exist—aged couples whose children have left the village, and middle-aged families who live separately from their parents. Both types are on the increase.

Older women in the former type of nuclear family are unable to work at sea, so that jobs of this type become the sole responsibility of older men. Older men, however, cannot physically match the performance of younger men, so their involvement in work at sea is limited to lighter tasks in fishing grounds near shore.

The absence of older women in the other type of nuclear family prevents an arrangement in which older women take responsibility for domestic and child-rearing tasks while younger women work on boats or in other jobs. Women are therefore unable to engage in full-time employment. Furthermore, the irregular schedules demanded of family-run fishing businesses, involving as they do nighttime work, prevents women from taking advantage of welfare facilities such as day care and preschools. These circum-

stances have strengthened the tendency for women to work in regular, wage-based daytime jobs.

In traditional fishing villages with a low level of urbanization, multigeneration households are still the norm. In such households, older women perform domestic and child-minding tasks, giving younger women a wider selection of employment options. The undeveloped labour markets in such areas, however, mean that young women tend to work at sea if there are employment opportunities in the fishing industry, such as during the laver-growing season.

### (3) Development of the Labour Market

The extent of development of a region's labour market naturally has a big impact on employment patterns for women. Development of the labour market, however, occurs in different circumstances in the fisheries sector than in agriculture. If men shift to jobs outside the fishing industry, their families may be unable to support a family-run business because women alone cannot operate the business (except in the case of *ama* diving operations). This situation forces women, too, to seek employment outside the fishing industry. In areas with an undeveloped labour market and a long off-season, many men are forced to seek employment elsewhere for that period, as is the case in agriculture. During this season, women cannot support the fishing business alone and so their labour is either unused or diverted to extremely unprofitable tasks.

### (4) Parallel Businesses

Seasonal variations in the fishing industry mean that labour requirements differ considerably between the on- and off-seasons. Fishing households whose womenfolk work in semi-permanent wage-based jobs can depend only on their regular labour resources even during the height of the season. On the other hand, female fishing-household members working in family-run businesses such as agriculture, retail selling or service operations can participate in fishing during the busy season, making possible an expansion in the scope of fishing operations. The benefits of this latter arrangement are most pronounced in those types of fishing operations that involve household-run processing or that require extensive periods of shoreside preparation. These benefits inhibit the women in families performing such types of fishing from taking wage-based jobs in favour of a parallel family-run business that leaves them free to participate during the busy fishing season, even if they are underemployed at other times of the year. The predominance of parallel farming businesses among families who cultivate laver (table 4.13) reflects a desire to keep the labour of female members close at hand in order to cope with the busy harvest period.

### (5) Type of Fishing Activity and Composition of Crews

The type of fishing activity a household performs has a strong influence on female labour patterns. Women are needed to perform shore-based tasks if

such tasks are a large component of overall activities (as in the case of processing of the catch and marine farming). Regular types of fishing by net or line do not require any shoreside tasks in particular.

The composition of the workforce at sea is also influential. Of coastal fishing families operating boats of less than 10 tons, 54 per cent rely on a crew of one, 33 per cent on two, and 13 per cent on a crew of three or more (based on 1978 Fisheries Census figures). Boats operated by a single crew member do not produce a large enough catch to require a large amount of shore-based work by women. The influence of two-person crews on female labour patterns depends on whether those two people are father and son, brothers, or a husband and wife. A man-and-wife team operating at sea will also share the shoreside tasks, thereby reducing the time available for work at sea. Male family members working at sea will catch that much more than a single-person boat, and will be able to remain at sea for longer than a husband-and-wife team. Consequently, the amount of shoreside work will increase proportionately, and since the male family members working at sea will have less time for shoreside tasks, female members will bear the principal burden of those jobs.

In addition, of course, there are many coincidental conditions and subjective preferences of the people involved, and these, too, influence labour patterns.

## 2. Fisheries Work and Female Labour

Patterns of female employment in the coastal fishing industry are largely determined by particular types of fishing. Table 4.14 indicates the number of men and women involved in various fishing tasks (offshore). The first observation that can be made is that more than 40 per cent of all women work in the marine farming industry and that women account for more than one-third of the total labour force in this industry. Laver cultivation is typical; women account for about 40 per cent of the at-sea workforce in this sector. Second, we note that one-fourth of all female workers are employed in the combined shellfish- and kelp-gathering sectors (including diving by *ama*). The ratio of women in the total workforce in each of the two sectors is more or less equivalent to that in the marine farming industry.

Table 4.14 shows clearly that marine farming and shellfish- and kelp-gathering are the principal work of women. These activities fit in well with the requirement that women be available for domestic tasks. They are performed close to shore. They involve relatively long periods of shoreside labour and subsequently require only brief periods of work at sea. Furthermore, women performing these activities are able to enjoy a reasonable degree of flexibility when they work. Finally, with the exception of *ama* diving, these activities do not require particularly demanding skills, so that women can easily substitute when the number of men decreases.

Small-scale fixed shore netting resembles breeding and gathering tasks. Schools of fish caught by fixed shore netting do move, but the area where

Table 4.14. Self-employed Persons in Fishing by Type of Work, 1978

	Men		Women		Ratio of women,
	Number (A)	Proportion (%)	Number (B)	Proportion (%)	$\frac{B}{A+B}$ (%)
Marine farming	58,693	24.5	32,022	42.4	35.3
Laver-cultivation	29,690	12.4	19,065	25.2	39.1
Shellfish-gathering	17,325	7.2	10,661	14.1	38.1
Kelp-gathering	14,658	6.1	7,993	10.6	35.3
Gill-netting <sup>a</sup>	30,940	12.9	8,437	11.2	21.4
Small-scale trawling	16,405	6.9	3,929	5.2	19.3
Small-scale fixed shore netting	7,039	2.9	2,112	2.8	23.1
Line-fishing <sup>b</sup>	39,336	16.4	2,753	3.6	6.5
Other	54,774	22.9	7,705	10.2	12.3
<b>Total</b>	<b>239,170</b>	<b>100.0</b>	<b>75,612</b>	<b>100.0</b>	<b>24.0</b>

a. Drift-netting of salmon and trout is not included in the figure for gill-netting.

b. Line-fishing of bonito, mackerel, and cuttlefish is not included in the figure for line-fishing.

Source: *Gyogyō sensasu* [Fisheries Census].

humans work is fixed by the position of the nets, so that the labour requirements are virtually the same as in breeding and gathering. The low number of family-run businesses working at fixed shore netting is responsible for the limited number of women working in this sector. When considered as a share of the total employment in this sector, the number of women is high—about one-fourth.

In contrast, strong limitations affect the extent to which women work in the line-fishing sector, as represented by work on fishing vessels. The catch in line fishing is highly mobile and the movements of schools of fish make it impossible for operators to determine their working schedules arbitrarily. The fishing grounds are distant from shore, making it physically difficult to work for only short periods. And line-fishing is not economically viable. In consequence, the component of women in the line-fishing workforce is a mere 6 per cent.

Of course, circumstances prevent the total exclusion of women from crews working on vessels, even in some fishing sectors requiring a high degree of work at sea. Women are included in crews for gill-netting, in which much time is spent removing fish from the nets. Women also participate in trawling to sort the catch by variety and size. Nowadays, the overall decline in the number of workers has led to more men working alone in these sectors without calling on the labour of women. In such cases, however, the tasks of removing fish from the nets and sorting must be performed either

onshore (leading to an inevitable decline in the freshness and, therefore, value of the catch) or during breaks in the fishing process while still at sea. The direct economic advantages of these arrangements have meant that more women (mostly the wife of the man working the fishing vessel) will work on board despite the extra effort required to cover domestic tasks as well. Many fishing localities retain their aversion to the practice of women working at sea on board fishing vessels. But the desire to increase the level of the catch is proving stronger than that aversion.

### 3. Patterns of Female Employment in Coastal Fishing Families

This section reconsiders the patterns of female employment described in tables 4.7 and 4.8 on the basis of the above discussion.

#### (1) Continuous Work at Sea

This pattern refers to women who work on board fishing vessels continuously. Specifically, it includes women who work year-round at regular fishing tasks, and women who combine seasonal work in marine farming with work at sea. The inability, even today, of women to work alone means that this pattern usually involves a husband-and-wife team. Women following this pattern are not able, of course, to engage in wage-based work. This pattern, including cases of parallel work in agriculture, is the most self-contained form of family-run business.

#### (2) Seasonal Work at Sea

The most typical form of this pattern, in which women only work at sea on a seasonal basis, is marine farming, but the pattern also covers cases of regular fishing, when women work on board vessels only during the busiest periods, and of *ama* diving. Three household arrangements predominate in this pattern:

1. The combination of men working year-round at fishing and women working at agricultural tasks, part-time wage-based jobs, or shore-based fishing tasks during the summer, and at marine farming during the winter.
2. The combination of men working year-round at fishing and women working in tasks at sea in a supplementary role during the busiest season, and at agricultural tasks, part-time wage-based jobs, or shore-based fishing tasks as their regular occupation. Another pattern exists in regions such as the northern sector of the Japan Sea coast, where severe conditions make operation during winter difficult.
3. Performance of fishing tasks by husband-and-wife teams during the summer, and local or distant employment in wage-based jobs by the husband and wife (or husband alone) during the winter.

In all cases, fishing families give priority to their fishing business, with the result that any secondary activities in agriculture receive only perfunctory care, and wage-based employment is of a short-term, unstable character.

### (3) Fisheries-related Shore-based Tasks as Principal Employment

Women in fishing families perform related shore-based tasks to differing degrees. When the volume of such work is low, the weight of work in other industries is high, but when the extent of shore-based-fisheries-related activities is high, women tend to pursue such employment as their principal occupation. Three arrangements predominate in this pattern:

1. The head of the family business and his son crew the fishing vessel, thereby raising the size of the catch over that of a single-person operation (in this case, women take responsibility for preparing fishing tackle, for coiling ropes, and for landing the catch).
2. Family-operated processing of the catch, thereby earning income from value added (this covers tasks such as drying of kelp, removing shellfish from their shells, and boiling).
3. Door-to-door sales of the catch by women in areas where a regional market exists.

Under these arrangements, women work as long as, and frequently longer than, men working at sea, also taking responsibility for domestic tasks. These circumstances virtually exclude any opportunity for entering the wage-based labour market.

### (4) Parallel Employment in Other Sectors as Principal Occupation with Secondary Employment in Fisheries-related Shore-based Tasks

When the scale of a family-run fishing business is small and the size of the catch too is small, even women performing shore-based fisheries-related tasks are able to find wage-based employment in non-fisheries sectors. Often, such employment is also a matter of necessity. Such women, however, work extensively in the family fishing business during the busy season, and also tend to assist routinely when fishing vessels are leaving or entering port. In consequence, the pattern of this wage-based employment is strongly influenced by the irregular schedule of a family-run fishing operation. It is based on the short term and is changeable both seasonally and daily. Women working in this pattern are employed at the lowest levels of pay, mostly as part-time labour in processing fisheries produce. Operators of processing firms adapt to these conditions by having detailed knowledge of the lifestyle patterns among family-run fishing businesses.

### (5) Regular Wage-based Employment

In regions close to urban centres where employment can be obtained easily, many young and middle-aged women work as employees in companies, the civil service, or fisheries cooperatives. Jobs of a full-time nature in supermarkets and offices also fall in this category. Young women who do not yet have children (particularly those who have just graduated) commonly hold such jobs. But because the levels of pay in these jobs far exceed those in temporary positions, some older women who have children also opt to work full-time, depending on nurseries or older family members for child-

minding tasks. Many women not from a fishing background, but who married into fishing families, seek jobs in which they can use skills acquired in urban employment before marriage. Despite these conditions, on the whole many young women encounter difficulty in resuming jobs they held before marriage, childbirth, and child-raising when faced with stiff competition from new graduates.

The fixed hours of such regular employment virtually exclude any contribution to the shore-based tasks of the family-run fishing business. One result is that a shortage of workers to perform these tasks may occur during the busy season. Different families find different solutions. Older family members will sometimes fill the gap. Sometimes the family's male members will shorten their hours at sea to cover shore-based jobs. Or housewives from nearby farming families may be hired. In such situations, women will continue to work in their full-time jobs as long as their income is higher than the loss incurred through a decline in the size of the catch, or than the costs of hiring outside help.

The female labour market in farming and fishing villages has developed rather extensively around a focus on part-time employment. This development has occurred in the localized industry for processing farm and fisheries produce, in garment-making factories, and in factories that subcontract the assembly of machine components, as well as in various supporting home-based jobs. Striking regional variations are evident in this development, however. It is far advanced in villages located near centres of regional commerce, but seriously retarded in outlying regions where employment opportunities are almost zero. Nationwide factors stimulate further development: the regional relocation of factories spurred by continuing rapid economic growth; the expansion of demand for labour with the growth of small regional industries; greater commuter convenience with better roads and higher levels of motorization; and the improved supply of labour as the use of labour-saving devices has spread in homes and as social welfare facilities such as day care and nurseries have increased.

Even with more numerous employment opportunities, however, poor conditions of labour (low rates of pay and insecure tenure of employment) do not offer enough incentive for women to abandon their family-run businesses. Consequently, most women are forced to double participation in the family-run business with a wage-based job, and employers have to adapt holidays and working hours to fit in with family-run businesses.

These considerations limit the extent to which women in farming and fishing families can perform wage-based jobs, and even the nature of these jobs. The practice of holding a parallel wage-based job has given women in farming and fishing families an idea of the wage value of their labour in the family business, thereby strengthening their desire to put the family business on a rational commercial basis that reflects the worth of the labour involved. And, as women have moved out of domestic isolation, they have secured a greater sense of independence through earning individual incomes

of their own. This is another factor that has promoted modernization of the social relations in Japan's farming and fishing villages since the end of the Second World War.

#### IV. Conclusion

Technological progress was slow to start in Japan's farming and fishing industries before the war. Despite this, the female members of farming and fishing families moved into a wide range of jobs. Struggling to subsist in the face of poverty, the underdeveloped nature of labour markets forced these women to accept employment patterns with a high level of servitude to their employers. These conditions have changed dramatically since the war, offering women the option to choose where they want to work by comparing a range of possibilities.

Labour markets in cities and in farming and fishing villages have expanded. The nature of family-run businesses has changed in response to technological progress. These movements have presented women in farming and fishing families with new problems and new choices. Do they leave their village for the city after graduating from school, or do they stay? Do they want to marry into a farming or fishing family, or not? How will they divide up jobs among family members? What job suits them best? And as they grow older, new questions confront them.

The way individual women answer these questions is shaping employment patterns. This chapter has attempted to generalize about these answers and to uncover those patterns.

#### Notes

1. This chapter does not consider capital-based fishing operations run using hired employees, and concentrates only on family-run businesses. The former include deep-sea and offshore fishing, the latter coastal fishing involving vessels of 10 tons and under.
2. Except when running farming business at the same time, jobs held jointly by the head of a fishing family are limited virtually to seasonal employment at times when no fishing is taking place. The only jobs that can possibly be performed jointly during the fishing season are coastal activities such as kelp-gathering. Such jobs generate only a tiny income.
3. The refusal to adopt modern diving techniques leads inevitably to accidental deaths, such as when a diver runs out of breath while on the ocean floor. *Ama* divers are not the only examples of fisherpeople who depend on the regeneration of natural resources and who oppose the introduction of available modern techniques. A common means of fishing abalone in many regions is to pierce the abalone from a boat with a long pole fitted with a sharpened hook. Only this method is permitted in these regions, which also limit the size of motors fitted to boats.

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