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GROWTH AND EQUITY IN AGRICULTURAL DEVELOPMENT

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*Changing Rural Employment Patterns: Role of Off-farm
Employment for Balanced Rural Development**

INTRODUCTION

In the early decades of development, employment objectives were often treated as a by-product of economic growth, which emphasized industrialization as a leading element. Today employment and equity are considered to be the central issues of development goals. We now realize that without steady development of the agricultural sector and of rural areas, overall economic development will be hardly achieved. Considering the fact that the urban-industrial sector has often limited capacity to absorb the growing rural labour force, there are two alternatives for employment expansion. One is to enhance the labour absorptive capacity within agriculture, the other is to create rural off-farm employment. This paper focuses on the latter alternative.

The aim of this paper is threefold. First, we attempt to give an overview of the extent and nature of off-farm employment in both developed and developing countries. Second, we attempt a theoretical analysis to explain the rationale for off-farm employment or part-time farming. Finally, we examine the viability and policy implications of off-farm employment for sustained rural development.

Employment patterns in rural areas are always changing¹. One well-known fact is that the relative share of the agricultural labour force has been declining in the process of industrialization and urbanization. The other important change, which has been frequently neglected, is the shift toward more off-farm employment in rural areas of both the developed and the developing world. Statistical evidence shows that an increasing percentage of the rural labour force is engaged solely or in part with off-farm employment. Rural off-farm activities are becoming an important source of income in many developing countries. Though the nature and implications are essentially different, advanced countries have also shown a general trend of increased part-time farming, a combination of farm and off-farm employment by farm households².

* This paper also represents an outcome of the discussion in the Seminar on Mixed Households (Part-Time Farming) at Ljubljana, Yugoslavia, 22-24 June 1981.

TABLE 1 *Distribution of employed labour force between agricultural* and non-agricultural activities in rural areas: selected countries¹*

Category	Country	Year	Primary employment		Cropped area per agricultural worker
			Agricultural	Non-agri-cultural	
			%	%	ha. ²
Rural areas, excluding urbanized settlements	Kenya	1969	72	28	0.48
	Iran	1972	67	33	4.63
	Colombia	1970	77	23	1.82
	Indonesia	1971	72	28	0.63
	Thailand	1972	82	18	0.84
	Philippines	1970	72	28	1.16
	Korea, Rep.	1970	81	19	0.38
	Taiwan (China)	1966	51	49	1.12
	India	1966/67	80	20	0.50
Rural areas, including rural towns	Colombia	1974	57	43	
	Philippines	1970	60	40	
	Korea, Rep.	1970	75	25	
	Taiwan (China)	1966	49	51	
	India	1966/67	76	24	

Sources: ¹ Extracted from the statistics arranged by Anderson, D. and Leiserson, M. W., *Rural Enterprise and Nonfarm Employment*, A World Bank Paper, January 1978, Table 1., pp. 17-18; ² Calculated from Food and Agriculture Organization, *Production Yearbook*, for the year 1970.

*Includes agriculture, forestry, fishing, and hunting.

Until now, however, neither agricultural economists nor developmental scientists have to any extent studied part-time farming (or off-farm employment in more general terms) as a major field of professional emphasis. They have tended to consider this phenomenon as either a transitional pattern in the economic development process or simply a secondary, insignificant matter. The fact is that off-farm employment has been expanding and plays under some conditions an important role for sustained rural development.

EXTENT AND CHARACTERISTICS OF OFF-FARM EMPLOYMENT

It is not easy to identify and measure statistically the extent of off-farm employment, due mainly to the lack of statistics on rural off-farm employment in many developing countries. Furthermore, there exists no formal definition for rural off-farm employment, nor is there any clear distinction between rural and urban areas.

A recent World Bank paper, however, has attempted to compare the levels of rural non-farm employment in some developing countries. It reports that for most of the 15 developing countries where recent statistics are available, the percentage of the rural labour force primarily engaged in non-farm work is, as a minimum estimate, between 20 and 30 per cent. The report also shows that when somewhat urbanized larger rural towns are included, the non-farm percentage of the rural labour force is raised substantially to roughly 30 to 40 per cent³, as is shown in Table 1.

In Asian countries, where nearly two-thirds of the Third World's population live, work outside farms may have even greater potential importance because of the way agriculture is developing. Land fragmentation has produced a number of landless and nearly landless people. Larger more wealthy farmers are often adopting inappropriate and expensive farm machines, reducing the demand for hired farm labour. Hence, off-farm employment offers an important source of income for rural families, especially the poorer ones.

In already developed countries, too, off-farm employment and incomes are a significant component of farm households today. In Japan over 80 per cent of the total farm households have one or more members of the family working off-farm; in the United States over 50 per cent of the farm family income was obtained from off-farm sources in recent years. Table 2 shows to what extent major OECD countries have part-time farming units relative to the total number of farms in recent years. It should be noted here that the percentage of off-farm income to total family income has increased in the last decade or so in most of these countries.

Causes and motivations for combining off-farm employment with farming are numerous, depending upon the type of farming and resource endowments of individual farm households and the land and labour market situations of the area concerned. But basically they are classified into 'push'

and 'pull' factors. Among important push factors are limited opportunities to expand farm incomes, due probably to small farm size or lack of capital and technological progress within agriculture which enables shorter hours of labour input. On the other hand, a most important pull factor is increased off-farm employment opportunities, due mainly to industrial growth and transportation development⁴.

Differences among countries in terms of the extent of off-farm employment can be explained by both economic and non-economic factors. But two factors seem to be particularly important. One is the degree of agricultural opportunity, a typical example of this being the average farm size. It is generally observed that the smaller the farm size, the greater percentage of income tends to be gained from off-farm sources. The other factor is the degree of industrialization and the location of non-farm employment opportunities. The high figure for off-farm employment in Taiwan, for example, is due not only to an extremely small farm size but also to well-developed decentralized industries, together with short commuting distances, all of which are well contrasted with the experience of Thailand⁵ where the man/land ratio is relatively small.

TABLE 2 *Extent of part-time farming in some OECD countries*

Country	Year	Full-time	Part-time		Average farm size
			Class I ¹	Class II ¹	
		%	%	%	ha
Japan	1965	21.5	36.7	41.8	1.0
	1975	12.5	25.4	62.1	1.1
West Germany	1965	40.9	25.7	33.4	8.9
	1975	45.2	15.3	39.5	13.8
United States	1959	55.1	15.0	29.9	121.2
	1969	45.7	14.3	40.0	155.6
Norway	1972	33.4	21.5	44.1	17.6
Austria	1973	45.8	10.5	43.7	19.4
Switzerland	1975	48.6	9.1	42.3	8.7
Italy	1970	62.4	5.0	32.6	6.9
Netherlands	1975	74.1	6.3	18.4	11.6
France	1970	77.4	5.8	16.8	22.1
Canada	1970	69.4	10.7	19.9	187.5

¹Full-time farming is roughly defined as where no income from off-farm work is obtained; part-time farms are divided into two categories: Class I (Class II) is the farm in which less than half (over half) of the household income comes from off-farm sources, or less than half (over half) of the operator's working time is devoted to off-farm employment.

Sources: *Part-Time Farming in OECD Countries: General Report* (Paris, OECD, 1978); *Production Yearbook* (Rome, FAO, 1975).

As the economy of a nation develops, the characteristics of off-farm employment change, usually from subsistence orientated to modern

industrial activities. At the early development stage, traditional manufacturing such as weaving cloth and leather-making are dominant; cottage industry, simple food processing, or petty trading may also be prevalent. Later, off-farm employment tends to shift to become more capital intensive in nature and geographically it moves from rural to urban areas. At any stage of development, however, off-farm employment can provide the farming population with additional employment and incomes.

Another important aspect of off-farm employment is that such work plays an important part in evening out employment opportunities over the year in rural areas. Agricultural work by its nature has usually a large swing between near full employment in peak periods, such as planting and harvesting, and nearly total unemployment in the slack season. That is why off-farm work typically rises when farm work falls and falls when farm work rises. Off-farm work, if it is properly adopted, can decrease seasonal or disguised unemployment.

ROLE OF OFF-FARM EMPLOYMENT IN THE DEVELOPMENT PROCESS

We may now be able to summarize the potential role of off-farm employment in rural development. The following are three basic functions that can be played by off-farm employment, assuming that off-farm work is appropriately distributed and is spread to the desired segment of the rural population. This has been deduced from the post-war experiences of Japan, the Taiwan area, and Korea⁶.

Employment Expansion Effect

Off-farm activities in rural areas directly expand employment opportunities for the rural population. This is partly because it can utilize a disadvantaged labour force, such as women and the elderly who otherwise would have little opportunities to work in the modern sector. Also, off-farm work can even out labour utilization over the year since agricultural works are highly seasonal. Another advantage of rural off-farm employment is that it can provide additional employment in a relatively inexpensive way. This comes from the fact that such off-farm work tends to adopt more labour-intensive technology than the modern industrial sector in urban areas and usually uses local resources for local needs.

Income Distribution Effect

As pointed out earlier, off-farm employment is an important source of income for many rural families, especially those poorer families who possess little or no farmland. Various surveys indicate that the less land a farm family manages, the more off-farm work it does and the greater share of income is obtained from off-farm sources. This negative correlation between farm size and the level of off-farm income indicates that off-farm employment can contribute to a more equitable distribution of income in

rural areas. This appears to have greater significance to Asian countries where farmland is relatively scarce and fragmented and population density is very high, including a number of landless people.

Linkage Effect

Off-farm employment may bring about a closer linkage between agricultural development and industrial development, a factor which has often been lacking in development efforts. When off-farm employment is created, the level of farm family income is increased, which in turn increases the demand for both non-food consumption goods and agricultural inputs produced in the industrial sector. Rural off-farm employment can also reinforce the economic ties between urban and rural areas without worsening unemployment in already urbanized areas. Hence, off-farm activities may be considered to be an intermediary for a closer linkage between the rural agricultural and urban industrial sectors.

A THEORETICAL APPROACH FOR LABOUR ALLOCATION BETWEEN FARM AND OFF-FARM

The structural transformation of economies has been analysed by development economists using the macroeconomic analytical tools of dualistic growth models. But dualistic models usually work on an implicit assumption that the transfer of labour occurs discretely, that is labour is employed strictly in either one sector or the other. Not enough investigations have been undertaken to analyse theoretically the adjustment process at the micro-level. In particular the existence of part-time farming or off-farm employment taken up by farm households has seldom been taken into account in orthodox economic theories⁷.

In this section, we present a simple theoretical model to explain why such farm households with off-farm employment exist and how they respond to the changing structure of labour and land market conditions which take place with overall economic development. This model is a conventional income/leisure utility maximization type⁸.

We first assume that the farm household possesses the following utility function and tries to maximize its utility level, given its production function and exogenous parameters.

$$U = U(A, M) \quad (1)$$

where A is the total labour hours provided by the members of the whole household in a year and M stands for the amount of household income earned for the same period. This utility function is expressed as ordinary indifference curves which are upward sloping to the right in the income/labour diagram. Hence, it follows that:

$$U_A < 0; U_M > 0 \quad (2)$$

where $U_A = \delta U / \delta A$ and $U_M = \delta U / \delta M$.

The slope of the indifference curve, which is expressed as $-U_A/U_M (>0)$, measures the amount of M which is required just to compensate for a marginal increase in the family labour. According to Nakajima's terminology, we call this the marginal valuation of family labour. Since we assume that the utility function is a continuous, twice differentiable, monotonically increasing function of income (M) and leisure ($\bar{H} - A$), it is reasonable to assume that:

$$\frac{\delta}{\delta A} \left(-\frac{U_A}{U_M}\right) > 0, \text{ and } \frac{\delta}{\delta M} \left(-\frac{U_A}{U_M}\right) > 0' \quad (3)$$

The farm production function is assumed, again for simplicity, as the function of the labour input to the farm operation (A_1) and of the fixed amount of owned farmland (\bar{B}). It is assumed that no rental market for land exists.

$$F = F(A_1; \bar{B}) \quad (4)$$

The marginal product of labour of this production function is assumed to be non-negative and always decreasing, that is, $F_{A_1} \geq 0$, and $F_{A_1 A_1} < 0$.

We also assume that the farm household has employment opportunities off the farm. Hence the farm household as a whole may obtain income not only from farming but from off-farm employment. Then the total household income is expressed as the following equation:

$$M = P.F(A_1; \bar{B}) + w.(A - A_1) \quad (5)$$

where P is the market price of farm product; w is the fixed wage rate per hour; and $(A - A_1)$ is the amount of labour hours employed off-farm that is non-negative and has some limit, *i.e.*, $0 \geq A - A_1 \geq \bar{T}$.

By maximizing the utility function (1) subject to the income equation (5), we can get the following first-order conditions, solving $\delta U/\delta A = \delta U/\delta A_1 = 0$:

$$P.F_{A_1} = -\frac{U_A}{U_M} = w \quad (6)$$

These conditions imply that in equilibrium the marginal product of labour on the farm must be equal to the wage rate, and that the marginal valuation of family labour should also be equal to the off-farm wage rate. From the equations (5) and (6), we obtain the optimum amount of labour input (A_1^* and A^*) and the corresponding income level M^* .

An example of this equilibrium condition is depicted in Figure 1. This figure illustrates the case where the farm household takes up at least some off-farm employment (that is, $A^* - A_1^* > 0$) and obtain off-farm income, $w.(A^* - A_1^*)$. The equilibrium points are at Q and R , which determines the level of farm and off-farm labour input, respectively (or, Q' and R' in the

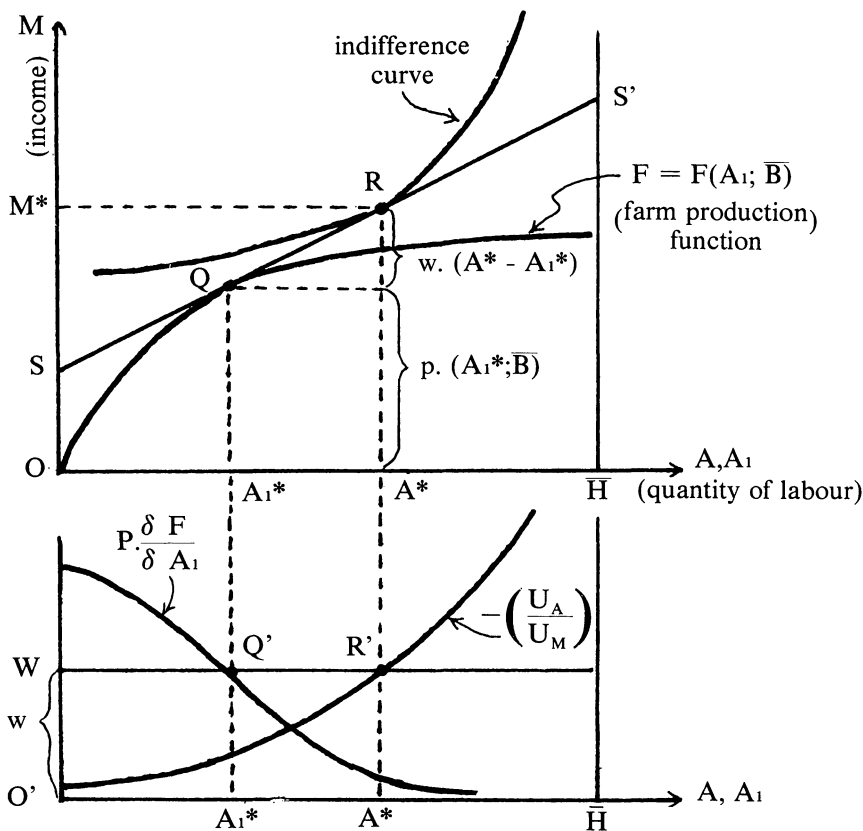


FIGURE 1 Subjective equilibrium of the farm household faced with off-farm employment opportunities

lower diagram showing the equilibrium of marginal values). It should be noted that there is no guarantee to obtain equilibrium at R that stands on the off-farm wage line SS' ; in some other case where the farm production function takes a much higher position than the one shown in Figure 1, no off-farm work may be taken up. Alternatively, when the farm household takes up off-farm work up to the limit (T), the equilibrium is represented by a corner solution, and the following equilibrium conditions hold:

$$P \cdot F_{A_1} = - \frac{U_A}{U_M} < w; A - A_1 = \bar{T} \tag{6'}$$

CONCLUDING REMARKS

Off-farm employment as a vehicle for sustained rural development

The above theoretical analysis indicates that taking up off-farm employment

can be a rational behaviour of farmers in which they adjust themselves to changing conditions of the labour market. The model also implies that other factors, such as wage rate increases, labour saving technical progress within agriculture, and more and longer off-farm work opportunities, may shift the labour allocation pattern toward relatively greater off-farm employment. In concluding this paper we examine some implications and required conditions of off-farm employment for sustained rural development.

Considering that off-farm employment takes up a substantial share of the contemporary rural labour force in the developing world and that it is situated at the interface between the urban industrial sector and the rural agricultural sector, off-farm employment should be taken into account as an important vehicle for a balanced and sustained rural development strategy focusing on growth and equity, particularly in areas where the man/land ratio is high.

Although it may be admitted that off-farm employment plays such important roles as employment expansion, more equitable income distribution and rural urban linkage creation, there are many difficult and complicated issues to be solved. Among those crucial issues are: (a) whether off-farm employment has a reasonable labour absorptive capacity; (b) how to provide such work opportunities to the needed segment of the rural population; and (c) whether or not off-farm employment brings about any negative effects on agricultural production and resource use⁹.

With respect to the labour absorption capacity, it should be noted that creating jobs in the urban industrial sector usually requires far more capital than the creation of jobs in the rural agricultural sector. In this context, off-farm employment tends to have technology with a lower capital/labour ratio than in the modern industrial sector which often uses a highly capital-intensive imported technology. A lower capital/labour ratio means that off-farm employment located in rural areas possesses a higher labour absorptive capacity per unit of capital investment. To be more successful, therefore, the choice of technology should be rather small-scale, locally adapted so that a less skilled labour force can have an access to it.

Finally, it must be noticed that off-farm employment alone cannot guarantee the sustained economic development of rural areas. Agricultural productivity has to be raised in order to have balanced development. Productivity increase in agriculture not only increases the demand for industrial inputs but also releases more labour hours to be utilized in off-farm activities. In sum, off-farm employment should be integrated with overall rural development efforts. Growth of off-farm activities in rural areas depends not only on government efforts to relocate non-farm industries but also on the steady growth of agricultural productivity.

NOTES

¹ For a detailed review on this, see P. Gregory, 'An Assessment of Changes in Employment Conditions in Less Developed Countries', *Economic Development and Cultural Change*, 28-4, July 1980.

² See for a general discussion of part-time farming in developed countries, S. I. Krasovec, 'The Future of Part-Time Farming', in *Proceedings of the Twelfth IAAE Meeting for 1964*, pp. 246-75, London, 1975; also see Kada, R. *Part-Time Family Farming*, Centre for Academic Publications Japan, Tokyo, 1980.

³ See D. Anderson, M. W. Leiserson, *Rural Enterprise and Nonfarm Employment*, A World Bank Paper, January 1978.

⁴ For a detailed description on this, see R. Kada, *Part-Time Family Farming*.

⁵ For a recent experience of Thailand, see T. Onchan, and Y. Chalamwong, 'Rural Off-Farm Employment and Income of Rural Households in Thailand', paper presented at the International Seminar on Off-Farm Employment and Rural Industrialization, FFTC/ASPAC, Tokyo, October 1981.

⁶ For the experience of Taiwan, see Ho, S.P.S., 'Decentralized Industrialization and Rural Development: Evidence from Taiwan', *Economic Development and Cultural Change* 28-1, Oct. 1979; see also for a comparative study of Korea and Japan, R. Kada, 'Employment Creation in Rural Areas: The Achievement of Saemaul Undong and Further Development', in Lee, M.G. (ed.), *Toward A New Community*, Seoul National University, April, 1981.

⁷ Exceptions in this area are: C. Nakajima, 'Subsistence and Commercial Family Farms: Some Theoretical Models of Subjective Equilibrium', in C.R. Wharton, Jr. et al., *Subsistence Agriculture and Economic Development*, Aldine, Chicago, 1969; J. E. Lee, Jr. 'Allocating Farm Resources between Farm and Nonfarm Uses', *Journal of Farm Economics* 47-1, 1965; and S. Hymer, and S. Resnick, 'A Model of an Agrarian Economy with Non-Agricultural Activities', *American Economic Review* Sept. 1969.

⁸ This section is an application of the subjective equilibrium theory of family farms, see C. Nakajima, *Subsistence and Commercial Family Farms*, pp. 165-96.

⁹ For a review and detailed discussion of labour absorption capacity of agriculture, see S. Ishikawa, et al., *Employment Expansion in Asian Agriculture*, ILO-ARTEP, Bangkok, March 1980; see also Hara, Y., 'Off-Farm Employment in Economic Development: Some Theoretical Considerations', paper presented at the International Seminar on Off-Farm Employment and Rural Industrialization, FFTC/ASPAC, Tokyo, October 1981.