RURAL LABOR MARKETS, RURAL NONFARM ENTERPRISES AND AGRARIAN REFORM IN THE PHILIPPINES: A REVIEW OF LITERATURE

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RURAL LABOR MARKETS, NONFARM ENTERPRISES, AND AGRARIAN REFORM IN THE PHILIPPINES: A REVIEW OF LITERATURE*

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I. INTRODUCTION

The agricultural sector in the Philippines continues to play an important role in the economy despite its limited capacity to absorb the existing rural labor force. This has led to the creation of a strong demand for nonfarm employment in the rural labor market, making the rural nonfarm sector a vital component of the rural economy. The growing interest in rural nonfarm activities stemmed from recent findings on the significant role of rural nonfarm enterprises in employment and income generation, and in the development process of developing countries.

This paper attempts to bring together and review studies concerning farm and nonfarm linkages, inter-sectoral linkages, and the rural labor markets. The next section focuses on existing studies analyzing the relationship between farm and nonfarm activities, the nature, structure and composition of nonfarm activities, and the linkages of rural nonfarm activities with the other sectors of the economy. Most of these studies explain how the rural nonfarm sector is related to the rest of the economy and how it is likely to react to changes elsewhere in the system. A survey of existing literature on labor demand, supply, and the labor market is presented. Finally, on the basis of the survey, research gaps on the area have been identified.

II. RURAL NONFARM ACTIVITIES: NATURE, GROWTH AND COMPOSITION

A. *The Growth of Rural Nonfarm Activities*

An important issue discussed in several development literature is the relationship between rural nonfarm activities and employment, and economic growth. The question appears to be whether or not rural nonfarm activities and employment will decline in importance as a country develops or industrializes (Chuta and Leidholm 1979). There have been varying views on this issue which will be the subject of the following discussion.

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The existing body of literature which explains the relationship between nonfarm economic activities and economic growth is dominated by the pioneering work of Hymer and Resnick (1969). Hymer and Resnick constructed an extended model of an agrarian economy with the inclusion of non-agricultural activities (Z- activities). The model describes the Z-goods sector as one which is dominated by home manufacturing and is an inferior source of income. The inferiority of home manufacturing is attributed as a result of industrialization whereby a shift from inferior methods of home production to superior means based on specialization and exchange occurs. The model predicts that Z-activities will decline with agricultural development. Such a hypothesis is supported by historical evidence from Burma, Thailand, and the Philippines for the period 1870-1938. Resnick (1971) traced the decline of rural industries in these three countries.

Bautista (1971) extended the Hymer-Resnick model into a small open economy. He pointed out that the inferiority of the Z-goods is an insufficient cause of the eventual decline of the sector. Fabella (1985), on the other hand, stressed that the rise in the manufacturing sector and the decline in Z-goods sector in the rural economy are due to the specialization in commodities in which the rural economy has some comparative advantage, not on the inferiority of the Z-goods sector. Furthermore, Fabella (1985) constructed a model of an open rural economy with three sectors: an exportables-producing sector, an import-substituting Z-sector, and a sector which produces nontradables. Based on this model, Fabella assumes that the rural export sector and non- trade sector will rise, while the import-substituting Z-sector will shrink as modernization takes place. The model is tested in terms of labor absorption in the different rural industries in the Philippines. The open model shows that the beverage and tobacco industries are Z-goods type of import-substituting activities that react negatively to modernizing stimuli. Food, wood, leather, furniture, and footwear are the sub-industries that react positively to these modernizing factors. Among the relevant modernizing factors are population density, education, electrification, roads, irrigation, and high-yielding variety of rice. As a policy implication, Fabella emphasized the importance of government infrastructure projects in the rural areas (e.g., electrification and the construction of roads and bridges) due to their strong indirect impact on the labor absorption of modern rural non-farm industries, especially those which produce exportable goods.

A study which theoretically explains the structural significance of rural nonfarm activities in the Asian monsoon economy in the macro perspective of agricultural and economic development was conducted by Choe (1986). The study introduced the M-cycle hypothesis. The M-cycle pertains to the phenomenon of cyclically repeating peak and slack seasons in farm labor utilization in the monsoon agriculture. Under the working of the M-cycle are two types of underemployment of farm labor in Asian monsoon agriculture: absolute underemployment and seasonal underemployment. The study put forward two empirical propositions that have important implications for the development of nonfarm and off-farm employment. (Choe 1985: 5-6)

(1) Given an M-cycle-dominated agriculture in the monsoon economy and the limited urban-industrial labor absorption capacity, it is not possible to increase labor productivity of farmers without increasing the productive use of labor during the slack season through nonfarm/off-farm activities and diversification of agriculture.

(2) The reduction of rural agricultural labor results in labor shortage during the peak seasons with the underemployed idle labor in the slack season. This implies the impossibility of reducing agricultural labor without limitation and without raising the real farm wages, provided there is no structural change in the intensity of the M-cycle.

B. *Rural Nonfarm Employment*

A number of empirical studies support the view that rural nonfarm activities and employment have been rising with development. The available time-allocation studies reveal high figures for the percentage of labor time spent on nonfarm activities in the rural economies. Mukhopadhyay and Lim (1985) and Oshima (1984) traced the experiences of East-Asian countries and found that rural nonfarm activities and employment in Japan, Korea, and Taiwan have gained significant increases as these economies moved through various stages of development. Anderson and Leiserson (1980) observed that the rural nonfarm labor force increased faster than agricultural labor force during the period 1959-1970 in the Asia-Pacific region. Chuta and Leidholm (1979) similarly confirmed the phenomenon using more specific micro data.

Empirical studies such as those conducted by Anderson and Leiserson (1978, 1980); Oshima (1984, 1986); Chinn (1979); Ho (1979); Chuta and Leidholm (1979); Liedholm (1989); Ranis, Stewart and Reyes (1989); Hazell and Haggblade (1990); and Reyes (1990) reveal an increasing percentage of the rural labor force primarily engaged in nonfarm work in developing countries. The findings attest to a rising share of the rural labor force engaged in nonfarm work partly as a result of slow labor absorption in agriculture. On the other hand, it may partly be a result of the increasing division between farm and nonfarm work in the rural areas -- something which is said to be induced by the high elasticities of demand for nonfood goods and services with respect to changes in rural incomes and agricultural output. Moreover, the availability of hired labor which allows substitution for family labor, and the increasing range and declining costs of labor-saving innovations in agriculture enhance the possibilities for off-farm and nonfarm work (Shand 1986).

Estimates of the proportion of the rural labor force with primary employment in nonfarm sector for 15 developing countries ranged from 20 percent to 30 percent (Anderson and Leiserson 1980). In addition, other studies estimate the share of rural nonfarm labor to total rural labor force at 25 percent and 35 percent (Liedholm 1988), about 20 percent for India (Hazell 1990), 25.4 percent for the Philippines in 1982 (Fabella 1985), 45.6 percent for Bangladesh in 1981 (Ahmad and Ahmed 1985), 27.9 percent for Korea in 1980 (Choe 1985), and 31.8 percent for Pakistan in 1980 (Chaudhry 1985). These figures would be higher if they included farm households with part-time (i.e., seasonal or secondary) nonfarm employment. For instance, the estimates obtained by various studies using micro data demonstrate that more than 40 percent of the rural labor force in Bangladesh are primarily engaged in nonfarm activities. The rate rises to about 55 percent when persons engaged in rural nonfarm activities as secondary sources of employment and income are considered (Ahmad and Ahmed 1986). The differences in figures representing the share of rural nonfarm employment to total rural employment among countries are partly due to the differences in the definition of the term "rural" (Anderson and Leiserson 1980). Economic factors also explain these differences. Take for instance Taiwan, one of the 15

developing countries that Anderson and Leiserson studied. Its decentralization of certain industries together with relatively short commuting distances have apparently made it possible for many members of rural households to shift to non- agricultural occupations without changing their residence. In contrast, the relatively high figure for Iran probably reflects the importance of more traditional rural nonfarm activities like carpet-making and handicrafts.

In a study of rural industrialization in the Philippines, Fabella (1985) found that the share of rural nonfarm activities in total rural employment for both sexes is approximately 30 percent from 1977 to 1982. The share of males' rural nonfarm employment to total rural employment is found to be between 22.5 percent and 24.7 percent during the same period. However, the share of females' rural nonfarm employment to total rural employment is found to be twice that of the males. The study also reveals that the share of rural nonfarm activities of wage and salary workers representing the formal sector of the labor market in the rural areas increased from 58.6 percent in 1977 to 69.5 percent in 1982. Moreover, that of the own-account workers who are considered as representative of the rural informal sector rose slightly from 19.4 percent in 1977 to 20.2 percent in 1982. Rural nonfarm activities also provide secondary employment to rural workers. According to Anderson and Leiserson (1980), a large proportion of small and landless farmers engage in nonfarm activities during the slack season. This observation indicates that rural nonfarm activities are important as a secondary source of employment for small and landless farmers. It has also been observed that farm and rural nonfarm employment varies countercyclically.

C. *Rural Nonfarm Income and Equality*

Leidholm (1988) asserts, "Income statistics can potentially provide an even better measure of the importance of rural nonfarm activities than employment figures" (p. 3). It has been observed by Anderson and Leiserson (1980) that nonfarm activities in rural areas are a primary source not only of employment but also of income for approximately one-quarter of the rural labor force in most developing countries, and a significant source of secondary income in the slack seasons for the small and landless farmers. Examination of incomes data in Japan, Korea, and Taiwan by Oshima (1984) reveals that off-farm income in both levels and shares increased as these countries underwent various stages of development.

Country studies conducted by Mukhopadhyay and Lim (1985) and Shand (1986) contribute a significant body of information on the extent of dependence of rural households on rural nonfarm activities as sources of income. Ahmad and Ahmed (1985) show that about 26 percent of the rural labor force in Bangladesh derive income from rural nonfarm activities. In India, 46 percent of self-employed households in the rural areas depend totally on rural nonfarm activities as the only source of income (Rao 1985). In the Philippines, it has been observed that 31.4 percent of total family income of farm households and 81 percent of total family income of rural nonfarm households are contributed by rural nonfarm activities (Fabella 1985). In 1971, rural nonfarm activities accounted for 55 percent of total income of rural households in the Philippines (Fabella 1985). In Korea, Choe (1985) found that about 11 percent of the total income of farm households is derived from rural nonfarm activities.

From a set of micro data in the Philippines (Laguna survey), Reyes (1990) observed that the proportion of time that rural household members spend on nonfarm activities has significantly

increased. Moreover, nonfarm income was found to have risen from eight percent in 1974 to 36 percent in 1987. The bulk of the increase in nonfarm income was shared proportionately by small and landless farmers. According to Reyes, the observations suggest that nonfarm income has an equalizing effect on income distribution and that its growth has helped offset the growing imbalance in agricultural income.

Chinn (1979) and Ho (1979) studied the Taiwan case to determine the impact of increased agricultural productivity on poverty reduction, and examine the effects of the spatial pattern of industrialization on the level of rural nonfarm activities. The increase in agricultural productivity in Taiwan, as pointed out by Chinn, was due to the removal of the major impediments through the implementation of an extensive land reform and the establishment of an effective network of farmer associations. Closer analysis, however, shows the significance of nonfarm activities as a major source of income. Income from nonfarm source, rather than increased income from farming, is found to be responsible for rising real income levels. Thus, it was concluded that nonfarm sources play an important role in reducing income inequality within the rural sector.

Ho, on the other hand, attempted to show using evidence from Taiwan that the level of rural nonfarm activities depends significantly on the spatial pattern of industrialization. His paper examined the impact of decentralized and rural industrial growth on farm households. Ho pointed out that Taiwan's industrialization has followed a more decentralized pattern, which allows rural industry and agriculture to grow in a mutually reinforcing manner. This decentralized industrialization has then enabled an increasing number of farm households to combine farming with part-time or full-time employment in nonfarm activities, and thus has helped to ease both the pressure of population on the land and the corresponding pressure on farm household members to migrate to cities for jobs.

From the aforementioned studies, the Taiwan experience implies that rapid industrialization and spatially decentralized industrialization can occur simultaneously, and that decentralization has beneficial effects on the rural sector. Moreover, the Taiwan experience also suggests that because of the numerous linkages of agriculture with other sectors, a diversified agriculture is more likely to stimulate the growth of rural nonfarm activities than a sluggish agricultural sector. Both studies stress that if rural industrialization is desired, a well-developed transportation network and rural education are also crucial.

Both Chinn (1979) and Ho (1979) observed a reduction of income inequality in Taiwan. This reduction was attributed to the fall in the Gini coefficients of farm families from 1964 to 1975 due to the growing contributions of nonfarm income.

Aside from the Philippine and Taiwan experiences, there is ample evidence which highlights the role of nonfarm income in reducing inequality and smoothing rural household income over time. A study on rural Thailand by Narongchai (1981) showed that the Gini coefficient falls from 0.58 when only the farm income is considered, to 0.38 when all the sources of the rural household income are considered. A study in India by Hazell (1990) revealed that landless farm laborers and small farmers derive half or more of their income from nonfarm activities. This finding indicates the important role that rural nonfarm activities play in poverty alleviation in India. Similarly, analysis of income data in the Asia-Pacific region by Leidholm (1988) reveals

some evidence that nonfarm income reduces inequality in the region. Rural nonfarm activities also contribute to the smoothening of household income over time. It was observed that since farm and nonfarm activities tend to move in opposite directions over the year, income from nonfarm sources appears to complement the pattern of net farm income received.

D. *Sectoral Composition of Rural Nonfarm Activities*

Another important issue concerning rural nonfarm activities is sectoral composition. Chuta and Leidholm (1979) contend that the most important components of rural nonfarm activities are manufacturing, services, and commerce activities. Mukhopadhyay and Lim (1985), meanwhile, consider manufacturing, construction, trade and commerce, and services as the major elements of rural nonfarm activities. Manufacturing is observed to be the most important sector in almost all developing countries in Asia except the Philippines and Malaysia. Hazell (1990) believes that the dominant rural nonfarm activities in India are commerce, service, and small-scale manufacturing that cater largely to agricultural and rural consumer demands.

In general, the compositional pattern of rural nonfarm employment in developing countries appears to be between 20 percent and 30 percent in manufacturing; 20 percent and 35 percent in services including government services; 15 percent and 30 percent in commerce; five percent and 15 percent in construction; five percent in transport; and the rest in utilities and other activities (Anderson and Leiserson 1980).

In summary, empirical evidences in developing countries support the view that rural nonfarm activities and employment have been increasing over time not only as a secondary but as more permanent primary sources of employment and income of rural households. The empirical estimates also suggest an increasing dependence of rural households, particularly the landless and hired farmers, on nonfarm activities as a source of income. Incomes derived from rural nonfarm activities exhibit equalizing effect on rural income distribution and offer better chance of realizing equity objectives of development.

III. DETERMINANTS OF RURAL NONFARM ACTIVITIES: LINKAGES OF RURAL NONFARM ACTIVITIES WITH AGRICULTURE AND OTHER SECTORS

The primary sources of demand for rural nonfarm goods and services are those stemming from rural households and/or enterprises. The rural households' demand for consumer goods tends to be quantitatively the most significant, followed typically by their demand for intermediate goods and services that arise from backward and forward linkages.

The first economists to explore the potential linkages between agricultural and non-agricultural sectors were Hirschman (1958), Johnston and Mellor (1961) and Mellor (1976). Hirschman (1958) argued that weak linkages exist between agriculture and other sectors including rural nonfarm activities. Mellor (1976) added that such linkages of agriculture with other sectors are essential to rural-led growth strategy. However, according to Shand (1986), these studies lacked the detailed knowledge of the characteristics of these linkages, and the explanation on how the linkages had developed. An understanding of how rural nonfarm activities are linked not only with agriculture but also with other sectors of the economy is an

important issue for policy. Likewise, it is also relevant for policymakers to determine how rural nonfarm activities will react to changes elsewhere in the system.

Empirical evidence on the linkages between farm and rural nonfarm enterprises, and the strength of these linkages in the developing countries is still sparse. One of the few studies examining these linkages was conducted by Gibb (1974). He found that each one-percent increase in agricultural income in the Nueva Ecija province in the Philippines generated a 1-2 percent increase in employment in most sectors of the local nonfarm economy from 1967 to 1971. Ranis *et al.* (1990) observed that the linkage effects from additional agricultural output are very substantial, even as policies are not conducive to promoting them.

A regional investigation of an irrigation project in Malaysia by Bell, Hazell and Slade (1982) discovered that for each dollar of income created in agriculture by the project, an additional $0.83 of value added was created indirectly in local nonfarm enterprises, the vast majority of which were small scale. Two-thirds of this indirectly created rural nonfarm activity were attributable to increased consumption expenditures, while one-third was due to backward and forward linkages with agriculture.

The study by Fabella (1985) revealed notable features of the linkage between farm and rural nonfarm activities. It was observed that manufacturing, construction, commerce, and transport activities of male workers engaged in nonfarm pursuits are cyclically linked with farm activities, while government and domestic services are countercyclical. It was also observed that female labor is always countercyclical or neutral to the cycles of farm operations. This indicates the absence of linkages between farm and nonfarm activities that most women engage in rural Philippines.

A. *Consumption Linkages*

Empirical evidence also shows that the largest and best documented linkage from agriculture to rural nonfarm activities is the one which arises from the rural households' expenditures on consumer goods and services produced by rural nonfarm enterprises. Consumption linkages are particularly important and agriculture is a vital element given the fact that farmers typically constitute the largest rural consumer group. The expansion of employment in absolute terms is found to be invariably the highest in consumption-related activities (Liedholm 1990). Contrary to the Hymer and Resnick (1969) thesis, there is strong evidence that rural nonfarm goods and services are not inferior, but rather have the potential to grow more rapidly than agriculture itself, providing an expanding share of all rural employment (Hazell and Roell 1983). In the Philippines, rural non-agricultural employment is dominated by consumption-linkage activities as evidenced by the large shares of trade and services to total rural non-agricultural employment (Ranis *et al.* 1990). Hazell and Roell's (1983) analysis of household expenditure data from Malaysia and Nigeria showed that the share of incremental expenditure allocated to rural nontradables increases proportionately with household income and farm size.

The study by Hazell (1984) proved that increased household consumption expenditure is an important aspect of growth linkages to the nonfarm economy. This implies that a large proportion of the income multiplier is due to increased rural households' demand for consumer goods and services. Moreover, Hazell (1984) pointed out that the strong household links to the

rural nonfarm economy not only help alleviate rural underemployment, but, because the major beneficiaries of the increased employment earnings are often the poor, also contribute to the reduction of rural poverty and malnutrition. In the examination of the indirect benefits arising from agricultural growth, Hazell (1984) presented a regional model which quantifies and captures the indirect effects of agricultural growth. The application of the regional model reveals that a regional economy's indirect benefits from agricultural growth are probably about the same size as the direct benefits. However, the size of the indirect benefits depends on agricultural price policy, aggregate farm household expenditure on rural nontradable goods and services, and the elasticity of supply of rural nontradables. It was pointed out that each of these factors is amenable to change through public policy.

B. *Forward and Backward Production Linkages*

The other important source of demand for rural nonfarm goods and services stems from their backward and forward linkages with agriculture and other sectors of the economy. The forward linkage from the rural nonfarm sector is such that rural nonfarm outputs serve as inputs to other sectors. On the other hand, the backward linkage from the rural nonfarm sector is where the nonfarm sector provides a demand for the output of other sectors (Chuta and Leidholm 1979). As the agricultural sector's output increases, its demand for intermediate and capital inputs can generate a backward linkage to rural nonfarm enterprises; the forward linkage from agriculture relates to the marketing and processing of its output (Liedholm 1988). Forward and backward production linkages from agriculture provide an additional push. Observations from developing countries' experiences reveal that among production-related activities, forward linkages are of much greater significance for absolute employment and employment expansion than backward linkages.

Bell and Hazell (1980) examined the impact of investment projects on farm and nonfarm linkages. Investment projects are said to generate substantial indirect effects or pecuniary external economies. These effects stem partly from production linkages.

The study proposed and applied an approach to measuring the magnitude and incidence of regional indirect effects based on a social accounts matrix and a variant of Tinbergen's semi-input-output method. The method was applied to the Muda project in Malaysia. It was discovered that in the aggregate, the Muda project's downstream effects are of the same order as the direct effects: for every additional dollar value added in paddy production generated by the project at maturity, about $0.75 of value added were generated by downstream effects. It was further learned that each dollar downstream value added was probably supported by just over a dollar additional investment in plant and equipment spread appropriately over the sectors which expanded in response to the project. Furthermore, the direct effects of the project did not worsen the distribution of income among farm households. Its downstream added value accrued mainly to the nonfarm households engaged in paddy milling and the production of nontradables. The project's production linkages were found to be much weaker than the consumption linkages, for value added in paddy production accounted for more than 80 percent of gross output.

A study on linkages by Haggblade and Hazell (1989) explored how key features of agricultural technology affect nonfarm growth linkages. It was done in two ways: (1) by reviewing an array of cross-section and time-series evidence bearing on the dynamics of rural

nonfarm economies in Asia, Africa and Latin America, and (2) through the use of a simple model which isolates the effects on nonfarm growth linkages of consumption and production parameters associated with different agricultural technologies.

Rural nonfarm activities are said to be stimulated by agricultural growth by boosting demand for production inputs and consumer goods. However, different kinds of agricultural technology promote various patterns of nonfarm linkages (Haggblade and Hazell 1989). On the other hand, research and extension policies will affect the type of technological change achieved in agriculture. These different technologies will, in turn, alter the nonfarm economy in several ways. Haggblade and Hazell (1989) resorted to modelling to isolate the key impact of alternative technologies on rural nonfarm economy.

The model revealed that technological innovation in agriculture generates significant increases in rural income over and above the direct impact on agricultural earnings. These benefits are of the order of 25 and 75 cents for each dollar of value added generated directly in agriculture. The relative size of the multiplier is found to be influenced by technological change, while the absolute size of the multiplier is largely controlled by institutional policies and resource environment in which agricultural production takes place. Haggblade and Hazell (1989) found that the multipliers tend to be smaller in Africa, for example, probably as a reflection of poorer rural infrastructure, lower population density, lower income, and consequently less consumer diversification into nonfoods, fewer prospects for irrigation and therefore, fewer backward linkages than other regions. Furthermore, consumption linkages are found to account for over 80 percent of the indirect income increments.

Haggblade, Hazell, and Brown (1989) empirically assessed the power of agricultural growth linkages in Africa. This was done by examining a 25-year accumulation of detailed survey data on the structure of Africa's rural nonfarm economy. Based on the limited evidence available to date, the study estimated Africa's rural agricultural growth multipliers to be on the order of 1.5, that is, a one-dollar increase in agricultural income generates about 50 cents of additional rural income, primarily among suppliers of rural nonfarm goods and services. This initial estimate is about 60 percent lower than the level prevailing in a few Asian countries from which multiplier estimates are derived. The study confirms the findings of Haggblade and Hazell (1989) that the African multipliers, as currently measured, are lower than those found in Asia.

Hazell (1990) examined the importance of rural-urban growth linkages in India. It was observed that the rural nonfarm economy accounts for 20 percent of full-time employment in India's rural economy, and 30 percent of rural income.

The relationship between agricultural growth and growth in the rural nonfarm economy was analyzed using two approaches: econometric analysis of cross-sectional state- and district-level data, and econometric analysis based on a semi-input-output model fitted to a national input-output table for 1979-1980. Both approaches provide estimates of the agricultural income multiplier, defined as the increase in value added in the nonfarm sector attributable to a one-rupee increase in agricultural value added. The econometric analysis estimated the income multiplier at Rs. 0.64, distributed as Rs. 0.39 in the rural towns and Rs. 0.25 in rural areas. In contrast, the semi-input- output model leads to an agricultural income multiplier of Rs. 1.35. The income multiplier for irrigated agriculture is Rs. 1.56, while it is Rs. 1.23 for rainfed agriculture.

In summary, the various studies indicate a strong linkage between agriculture and non-agricultural sectors in the economy. Consumption linkage is found to be the strongest and largest linkage from agriculture to rural nonfarm activities. Because of the strong linkages between agriculture and rural nonfarm activities, an important policy implication points to the possible impact of agricultural policies on the growth of the rural nonfarm sector.

IV. STUDIES ON LABOR DEMAND, SUPPLY, AND THE LABOR MARKET

The study of the labor markets requires quantitative analysis of the effects of changes in labor demand and/or labor supply on employment, wages, and productivity. Labor demand and supply are affected, directly or indirectly, by economic, social, and demographic factors as well as government policies. Analytical literature and empirical studies on employment and wage determination in poor agrarian economies are minimal. Empirical studies that emphasize farm-nonfarm relationship and its labor market implications are scarce, despite the fact that the operation of the rural labor markets can be better understood by analyzing the interaction between farm and nonfarm work.

The following section surveys the existing literature on labor demand, supply, and the labor market. Some of these studies are concerned with the agrarian economy but may not directly include the nonfarm sector. The theoretical analysis and the empirical results of these studies may serve as guides in the analysis of the rural labor markets, their relationship with nonfarm activities, and the impact of policies affecting the rural sector like agrarian reform.

A. *Labor Demand Studies*

Hamermesh (1976) surveyed the empirical literature on the demand for labor in the US. He also attempted to evaluate the short-run employment impact of selected subsidy/tax policies during a recession. The survey zeroed in on the employment-wage elasticity estimates (substitution effects) and the employment-output elasticity estimates (scale effects) of various studies.

In the theoretical framework, employment demand is shown as a function of wage, other factor prices, and output. It is assumed that output demand is a function of product price, and product price in turn is a function of factor prices. From these considerations, the elasticity of employment demand with respect to wage is arrived at. This elasticity equation contains the substitution and scale effects which are examined in the survey.

Tables 1 and 2 present the summary of the survey of empirical literature on labor demand. A substantial uniformity among the estimates of employment-wage and employment-output elasticities has been observed. The elasticity estimates have been grouped into three: medium, high, and low estimates. The analysis of the employment impact of wage-tax and wage-subsidy policies reveals the following: The wage-subsidy policies (employment tax credit and lower employer tax) have a positive and more substantial effect on employment demand. However, the wage-tax policies (higher UI tax base and health insurance tax) have a negative but smaller effect on employment demand.

TABLE 1

STUDIES OF THE EMPLOYMENT-WAGE ELASTICITY

AUTHOR	DATA AND INDUSTRY COVERAGE	ESTIMATES 1 Quarter	4 Quarters	LONG-RUN
	I. FACTOR DEMAND STUDIES			
A. MARGINAL PRODUCTIVITY CONDITION ON LABOR				
Dhrymes (1969)	Private man-hours, quarterly, 1948-60	0.28	0.68	0.75
Hamermesh (1975)	Private nonfarm man-hours, quarterly, 1955-73	0	0.36	0.89
Liu-Hwa (1974)	Private man-hours, monthly, 1961-71	0.54	0.67	0.67
Lucas and Rapping (1970)	All production man-hours, annual, 1930-65		0.46	1.09
B. LABOR DEMAND WITH PRICE OF CAPITAL				
Chow and Moore (1972)	Private man-hours, quarterly, 1948:IV-1967	0.16	0.35	0.37
Nadiri (1968)	Manufacturing, quarterly, 1954-65:			
	Employment	0.14	0.15	0.15
	Man-hours	0.17	0.19	0.19
Tinsley (1971)	Private nonfarm, quarterly, 1954-65:			
	Employment	0.001	0.01	0.04
	Man-hours	0.002	0.01	0.06
C. INTERRELATED FACTOR DEMAND AND ADJUSTMENT				
Brechling and Mortensen (1971)	Manufacturing employment, quarterly, quarterly, 1974:II-1969:III	0.06	0.14	0.15
Coen and Hickman (1970)	Private man-hours, annual 1924-40, 1949-65		0.14	0.18
Nadiri and Rosen (1974)	Manufacturing employment, quarterly, 1948-65:			
	Production	0.02		0.11
	Nonproduction	0.01	0.05	0.14
	II. CES PRODUCTION FUNCTION STUDIES			
Brown and deCani (1963)	Private nonfarm man-hours, annual, 1933-58		0.11	0.47
David and van de Klundert (1965)	Private man-hours, annual, 1899-1960		0.13	0.32
McKinnon (1963)	2-Digit SIC Manufacturing, annual, 1947-58		0.22	0.29

Source: Hamermesh, 1976 (pp. 512-513).

TABLE 2

STUDIES OF THE EMPLOYMENT-OUTPUT ELASTICITY

AUTHOR	DATA AND INDUSTRY COVERAGE	ESTIMATES		
		1 Quarter	4 Quarters	LONG-RUN
	I. FACTOR DEMAND			
Black and Kelejian (1970)	Private nonfarm, quarterly, 1948-65:			
	Employment	0.37	0.76	0.76
	Man-hours	0.56	0.87	0.87
Brechling and Mortensen (1971)	Manufacturing employment, quarterly, 1947:II-1969:III	0.69	1.10	1.11
Chow and Moore (1972)	Private man-hours, quarterly, 1948:IV-1967	0.30	0.67	0.71
Coen and Hickman (1970)	Private man-hours, annual, 1924-40, 1949-65		0.57	0.76
Dhrymes (1969)	Private man-hours, quarterly, 1948-60	0.46	0.88	0.90
Hamermesh (1975)	Private nonfarm man-hours, quarterly, 1955-73	0.24	0.65	0.75
Liu and Hwa (1974)	Private man-hours, monthly, 1961-71	0.70	0.84	0.84
Nadiri and Rosen (1974)	Manufacturing employment, quarterly, 1948-65:			
	Production	0.44	0.72	0.73
	Nonproduction	0.05	0.14	0.16
Lucas and Rapping (1970)	All production man-hours, annual, 1930-65		0.79	1.00
Tinsley (1971)	Private nonfarm, quarterly, 1954-65:			
	Employment	0.46	1.18	1.34
	Man-hours	0.97	1.10	1.10
	II. EMPLOYMENT ADJUSTMENT			
Brechling and O'Brien (1967)	Manufacturing employment, quarterly, 1952-64	0.42	0.71	0.72
Fair (1971)	Private nonfarm employment, quarterly, 1956-69	0.30	0.76	1.00
Kuh (1965)	Manufacturing employment, quarterly, 1948-60	0.45	0.79	0.80
McCarthy (1972)	Manufacturing and Mining, quarterly, 1953:III-1970:I			
	Employment	0.43	1.20	1.46
	Man-hours	0.61	1.03	1.05
Sims (1974)	Manufacturing, monthly, 1950-71:			
	Employment	0.67	0.96	0.96
	Man-hours	0.89	1.02	1.02
Solligo (1966)	Private employment, quarterly, 1947-61	0.25	0.49	0.49
Taylor et al (1972)	Manufacturing production workers, quarterly, 1949-69:			
	Man-hours	0.52	0.75	0.75
	Straight-time man-hours	0.38	0.69	0.69

Source: Hamermesh, 1976 (pp. 516-517).

The neoclassical labor market theory predicts that agricultural labor demand is primarily affected by changes in wage, farmer's output supply, agriculture-related variables such as size of farm, proportion of land irrigated, multiple-cropping intensity, seasonality, bullock labor, capital used, and high-yielding variety, and human capital variables like age, education, and work experience. It also assumes that a farmer's output supply is responsive to prices and opportunities for technological innovation. Assuming that farmers exhibit rational behavior by being cost- and profit-conscious, agricultural labor demand becomes highly responsive to changes in wage rates and output prices (Evenson and Binswanger 1984).

Studies by Bardhan for West Bengal (1984), Evenson and Binswanger for India (1984), Bautista for the Philippines (1988), and Rahman for Bangladesh (1991) estimated the labor demand functions of these poor agrarian economies to test the neoclassical hypothesis. For West Bengal, it was found that agricultural labor demand has a negative but insignificant response to changes in wage (Bardhan 1984). This is considered as an indication of the presence of rigidity in the labor requirements of agricultural operations in a given season. The estimates of the labor demand coefficients also suggest a seemingly positive significant relationship between agricultural labor demand and variables like size of farm, proportion of land irrigated, multiple-cropping intensity, and demand shifts with busy or slack agricultural season.

The Indian agricultural labor demand functions have estimated coefficients which are observed to be generally consistent with the hypothesized relationships, except that labor demand is found to be inelastic with respect to wages and output prices (Evenson and Binswanger 1984). In particular, labor demand in Indian agriculture is found to have a significant negative response to agricultural wage change. This contradicts the findings of Bardhan (1984) whereby wage is found to have a negative but insignificant effect on agricultural labor demand. The estimated coefficients are less than one, indicating an inelastic agricultural labor demand. Output prices are found to have a positive impact on farmers' hiring decision. But again, the coefficients indicate inelastic labor demand with respect to output prices. Human and bullock labor and human labor and tractor are deemed good substitutes. The regression results also indicate that irrigation investment and adoption of high-yielding varieties do not have substantial effects on agricultural labor demand.

For the Philippines, the results of analysis based on farm-level data show increased labor demand as a result of differential technical change (Bautista 1988). For Bangladesh, the results of the regression reveal a negative and significant relationship of wages with employment (Rahman 1991). Rahman considers this result as proof of the hypothesis that wage negatively influences demand for labor days. The elasticity of wage with respect to employment of women is less than one. The human capital variables are found to have little effect on female employment as well as pregnancy. However, location and having male workers in the household exert a negative and significant impact on female employment.

B. *Labor Supply Studies*

A few attempts have been made to test empirically the various models formulated to describe household labor supply behavior in the context of rural labor market in developing countries. Most of these studies are based on the standard neoclassical competitive framework.

One of the few pioneering works which recognized the existence of nonfarm activities as an alternative source of employment and income of rural households is that of Lee, Jr. (1965). He attempted to provide a theoretical framework to explain the motivation behind a farmer's decision to allocate farm resources, particularly nonfarm labor. This allocation decision is shown to be logical and consistent with a farmer's objectives of income maximization and efficiency in the use of farm and household resources. The model suggests that the emergence and availability of nonfarm employment opportunities, coupled with the awareness of farmers of such opportunities, reduce the aggregation and/or consolidation of the labor input on family farms. This may result to lesser technical unemployment and efficient use of resources in agriculture.

Developments in the analysis of household labor supply and demand have contributed to a better understanding of labor markets. The household labor model assumes that individuals in the rural sector exhibit economically rational behavior in making labor allocation decisions given certain constraints. Household labor is allocated among on-farm agricultural production, household production activities, off-farm and nonfarm work, and leisure. The household maximizes its utility subject to human time, income, and farm production (Huffman 1980). Maximum household income is obtained when the marginal utility from these four activities is equal.

The prominence of the household labor allocation model has led to a number of studies which determine labor supply in the agricultural sector. A competitive three-sector general equilibrium model of rural wage determination in a dualistic agricultural labor market was formulated by Rosenzweig (1978). The model is tested to identify and assess the impact of changes in agricultural labor supply on rural wages and wage differentials, and the effects of land reform on wage levels and sex/age wage differentials in India.

The theoretical analysis implies that the wage impact of partial land reform is indeterminate. This is due mainly to the assumption consistent with household level India data that landowning labor-exporting and -importing households employ family labor, so that market labor supply shifts are affected by opposing wealth-leisure effects. Empirical results of the model suggest that land reform in India would significantly increase wage levels and thus, benefit the landless households. This is seen as consistent with the implications of the competitive market model. However, the sex differentials in rural wages tend to widen due to land reform.

Rosenzweig (1980; 1984) determined wages and family labor supply in the agricultural sector of India. The neoclassical competitive, three-sector general equilibrium model formulated in the 1979 study was extended to both 1980 and 1984 papers. Rosenzweig (1980) tested the marginal efficiency role of schooling in agriculture based on labor supply behavior.

The empirical results using district- and household-level data in both studies are found to be consistent with the neoclassical framework hypothesizing that the annual number of days of wage employment for individuals in rural India is primarily supply- rather than demand-determined. The labor supply function estimates for male and female agricultural workers are observed to be similar to econometric labor supply findings based on US data, with the exception of the effect of fertility variable on labor supply which is found to be insignificant for India. The empirical results also disprove the institutional or exogenous wage hypothesis which indicates a strong influence of shifts in the agricultural sector's labor demand and supply

on rural wages. Specifically, the results show that rural wages respond strongly to aggregate changes in agricultural labor supply. The importance of sex differences in the labor market and that of labor supply as a family decision are also indicated by the regression estimates. The empirical estimates suggest that in the Indian rural labor market, the adjustment mechanisms concerning wages and labor supply are highly flexible. However, the rural labor markets are found to exhibit limited geographical mobility, particularly for males in landholding households and for all females.

Moreover, the econometric results in the 1980 study confirm the hypothesis that schooling, for both male and female members of landholding households, improves agricultural production efficiency and tends to reduce the off-farm labor supply of cultivators. An empirical study of labor supply and labor market participation behavior of peasant household was undertaken by Bardhan (1979). The study estimated labor supply functions in peasant agriculture utilizing the cross-section data of about 4,900 sample households including landless laborers, farmers, and non-agricultural workers in West Bengal, India in October 1972- September 1973. The estimates of labor supply functions of agricultural laborers, small cultivators, and women in the usual labor force show that labor supply for these types of workers responds positively to wage changes. The total labor supply of cultivators of all size groups has a positive but weak response to wage. Furthermore, it is observed that the labor supply of all-adult women and of hired farm labor for cultivators of all- size groups exhibits a locally backward-bending behavior. The elasticity of farm labor supply (in the case of agricultural laborers and small cultivators) with respect to changes in wage is less than one.

A major finding of the study is that labor supply is weakly responsive to wage rate, and is basically determined by other economic, social, and demographic factors. Such factors include number of adult workers in the family, number of dependents per earner, size of land cultivated by the household, standard of living, educational level of adults in the household, village multiple cropping index, and village unemployment rate. Using the neoclassical utility maximization model, Huffman (1980) presented econometric evidence of the effect of human capital variables particularly education and agricultural research and extension on the off-farm labor supply of farmers. The labor supply model predicts that an increase in the off-farm wage rate has a positive pure substitution effect and an ambiguous income effect on labor supply of single job-holding wage workers. In other words, a rise in off-farm wage may cause a substitution effect in household consumption and in farm production, and thus, redirect farm labor to off-farm activities. However, if leisure is a normal good, off-farm work declines as households substitute leisure for work. The same results will happen if a change in other incomes occurs.

The model also predicts that raising the education level of farmers and increasing the agricultural extension input may raise the off-farm labor supply of farmers through the efficiency effects. The results of the econometric model confirm the aforementioned predictions. Furthermore, the econometric evidence suggests that increasing both the education level of farmers and the agricultural extension input raise the off-farm labor supply of farmers. This implies that part of the return to education in agriculture arises from its effect on the reallocation of farmers' labor services between farm and nonfarm labor markets. Additionally, the econometric model also reveals that farmers with higher education utilize their labor services

from self-employed farm work to off-farm work faster than farmers with a lower educational level.

Keeley *et al.* (1978) presented a framework for using experimental data to estimate the parameters of a labor supply response function. The nationwide aggregate labor supply effects of alternative negative income tax programs are obtained by applying these parameter estimates to a national data base. The results indicate that the labor supply responses to alternative nationwide negative income tax programs vary widely with the parameters of the program, and that for some programs, the aggregate labor supply responses have a considerable magnitude.

C. *Labor Market Studies*

Yotopoulos and Lau (1974) provided a general framework on modelling the agricultural sector in developing countries. They introduced a theoretically consistent and empirically implementable methodology for the construction of general equilibrium models of the agricultural sector in a developing economy. The methodology for general equlibrium model construction integrated the micro and macro economic approaches. The methodology is considered flexible for it can accommodate various alternative assumptions on the environmental and institutional characteristics of the agricultural sector which lead to different types of equilibrium models. These equilibrium models may be used for comparative statistical analysis of the effects of changes in variables exogenous to the agricultural sector such as support or ceiling prices, terms of trade, rate of agricultural taxation, and agricultural land and capital policies.

In contemporary economics, one important question that must be addressed is whether or not the real wage clears the labor market. Much of the earlier analysis was based on the assumption of market clearing or equilibrium in the labor market (e.g., Patinkin 1965). On the other hand, the modern macroeconomic theory allows for the possibility that the real wage fails to equate the supply and demand for labor (e.g., Barro and Grossman 1971).

The first attempt at formulating and estimating a disequilibrium model of the labor market was made by Rosen and Quandt (1978). The study carried out an econometric test for determining the relationship between real wage and the labor market. Rosen and Quandt initially concluded that the labor market is in disequilibrium.

Rosen and Quandt constructed a simple model of the labor market based on microeconomic foundations. The model includes four equations representing marginal productivity of labor, supply of labor, observed quantity of labor, and real wage adjustment. The model with four versions of disequilibrium is tested using the annual data for the US economy for the years 1930-1973. The empirical results show that the four versions of disequilibrium model yielded qualitatively and numerically similar results. The elasticities of quantity demanded of labor with respect to the real wage and output are found to be close to unity in absolute value, and are within the range of other estimates of the labor marginal productivity condition. (Table 1) The net wage elasticity of labor supply is found to be small in absolute value and insignificantly different from zero. This suggests that the income and substitution effects of real wage changes are offsetting. Labor supply is found to have a positive elasticity with respect to unearned income. The elasticity of number of hours worked *vis-a-vis* the potential number of hours of work is found to be close to one. The coefficients on excess demand and real wage response to unions

are both positive and significantly different from zero. The parameter estimates of the disequilibrium model are consistent with *a priori* expectations. The supply and demand parameters are quantitatively in line with the results of earlier studies. It was observed that these elasticity estimates do not differ greatly from Lucas and Rapping's long-run elasticities although the equations in the model do not include lagged variables.

Two other studies focused on Rosen and Quandt's disequilibrium labor market model. Yatchew (1981) presented further empirical evidence on the model. On the other hand, Romer (1981) showed a revised Rosen-Quandt model by eliminating unearned income from the supply equation such that this revision causes the model to trace actual patterns of unemployment rates which the original model failed to do. The results of the revised model by Romer demonstrate that disequilibrium models can follow observed patterns closely, and that they may therefore be potentially powerful tools in the analysis of labor markets. Yatchew found that the disequilibrium model is still preferred and performs better using post-war data.

The neoclassical theory predicts that, other things equal, the change in total demand for labor in agriculture can be due to the changes in individual demand factors such as real wage in agriculture, farm product prices, prices of labor-substituting inputs, technological changes, productivity of labor, and size of industry. The change in total labor supply can be attributed to changes in real wage rate in agriculture, real wage rate in the non-agricultural sector, workers' preference for farm work, and size of the labor force.

There are several empirical studies on the rural labor market in Australia which test the neoclassical theory. For instance, Bhati (1978) identified and analyzed the major economic factors affecting the employment level of farm labor in Australia for the periods 1952-1953 and 1974-1975. The study developed a multi-equation labor demand and supply model, and utilized the three-stage least squares method to estimate the equations. The estimates of elasticities from the structural equations showed that real wage rate in agriculture affects labor demand negatively and labor supply positively. The wage elasticity of labor demand is observed to be close to unity, while the wage elasticity of labor supply is relatively inelastic. The ratio of output price to non-labor input price is found to have a positive effect on the farms' decisions to hire labor. The real wage in the non-agricultural sector has a negative effect on agricultural labor supply. It was observed that the absolute value of non-agricultural wage supply elasticity is larger than the other labor supply elasticity estimates. This suggests that real non-agricultural wage rate was the most important determinant of agricultural labor supply during the periods under consideration. The real income per farm is found to have a negative but weak effect on supply of family labor. Moreover, an increase in the size of the civilian labor force has markedly affected agricultural labor supply positively. The time trend is used as a substitute for a few variables which are difficult to measure like labor-saving technological change, labor productivity, and tastes. The time trend labor demand and supply coefficients are negative, implying a secular decrease in the demand and supply of agricultural labor in Australia in 1952-1953 and 1974-1975. The secular decrease in agricultural labor demand is due to the strong influence of labor-saving (capital-using) technological change in farm production. On the other hand, the secular decrease in agricultural labor supply is attributed to the increasing preference of the agricultural labor force for other rural and nonfarm employment, and the overall improvement in labor mobility.

In general, the empirical results showed the importance of non-agricultural variables in affecting demand and supply of farm labor. It was found that the most influential factor affecting labor demand and supply has been the non-agricultural wage rate. The wage rate in the non-agricultural sector increased during the periods under consideration. This caused the wage rate in agriculture to increase. These changes had two effects. First, the rise in wage rates in agriculture resulted in a decrease in labor demand which was found to be particularly wage sensitive. Second, the wage rate in the agricultural sector which increased relatively more than the wage rate in agriculture significantly influenced a withdrawal of labor from farms in favor of other rural and nonfarm employment. Previous studies (Ryan and Duncan 1974; Joyce 1975; Bhati 1978; Crowley and Spasojevic 1980; Ellahi 1981) which examined the determinants of rural employment through econometric modelling of the market for labor in Australia are numerous. However, most of these existing studies do not allow dynamic adjustment and are based on the assumption that the labor market is in equilibrium. These shortcomings are eliminated in the Evans and Lewis (1986) study.

The model is based on the traditional neoclassical demand and supply analysis incorporating a disequilibrium specification to allow analysis of market adjustment. Using the agricultural data for the period 1967-1984, the farm labor demand, supply, and market adjustment equations are estimated. The estimated demand for labor coefficients has the expected signs and is significantly different from zero. The demand for labor is found to be responsive to farm wages, prices of non-labor inputs, prices received, and technological process. The estimated labor supply coefficients indicate that labor supply is strongly responsive to real nonfarm wages while it is weakly responsive to real farm wages and, to a lesser extent, to the real value of unemployment benefits. The adjustment parameters in all equations are found to be significantly different from zero. These results justify the use of the disequilibrium framework to describe the aggregate farm labor market as opposed to market clearing models. They also suggest that the farm labor market can be described by the traditional neoclassical analysis with reasonably vast quantity but slow wage adjustment. Moreover, the results also imply that very large changes in farm wages are necessary for the labor market to clear when labor demand changes.

An application of the disequilibrium labor market model on the US nonfarm sector was done by Sarantis (1981). The study provided estimates of a disequilibrium labor market model using the data for the US private nonfarm sector and manufacturing sector. The disequilibrium model by Chow is utilized instead of the minimum-type disequilibrium model because the Chow disequilibrium model does not only provide wage and quantity adjustment mechanisms, but also treats the dynamic adjustments in wages and quantities symmetrically. The empirical results of the disequilibrium model are consistent with *a priori* expectations. The parameter estimates suggest that real wages show procyclical behavior in both private nonfarm and manufacturing sectors in contrast with the countercyclical behavioral prediction of classical and traditional Keynesian analyses. It was also observed that the adjustments of labor quantity transacted and real wage to their equilibrium values in both sectors are relatively slow and are symmetrically interrelated. Finally, the distributed lag response of the model to an output change implies convergence to long-run equilibrium of approximately four years in the private nonfarm sector and three years in the manufacturing sector. This supports the formulation of the disequilibrium model and allows rejection of the equilibrium hypothesis for the labor market.

Lewis and Makepeace (1981) estimated the aggregate demand and supply curves of labor in the UK covering the period 1949-1971. The estimates with and without homogeneity restrictions show that the coefficients have the signs predicted by economic theory. The demand curve coefficients are significantly different from zero, while the supply curve coefficients are influenced by the presence of multicollinearity. The application of the maximum likelihood approach results in estimates, suggesting that the supply curve is stable and well-defined whatever the time period. The elasticity of supply is within the 0.35 to 0.38 range. On the other hand, the demand curve appears strongly unstable when the data period is extended from 1949 to 1972.

In summary, the earlier survey of empirical literature on labor demand shows a substantial uniformity among the estimates of employment-wage and employment-output elasticities. Empirical evidence from various studies confirms the theoretical relationship between farm wage and agricultural labor demand. Farm wage rate has a negative effect on agricultural labor demand but the effect was found to be insignificant in some studies. Factors like size of farm, proportion of land irrigated, multiple cropping intensity, and seasonality positively affect labor demand in agriculture.

Agricultural labor supply responds favorably to changes in farm wage. Land reform was found to have a positive effect on rural wages and to have benefitted the landless; meanwhile, education of farmers and agricultural extension were found to have a strong positive effect on off-farm and nonfarm labor supply.

Generally, the empirical results from labor market studies show the importance of rural nonfarm variables in influencing the demand and supply of farm labor. It was found that the most influential factor that affects labor demand and supply has been the wage rate in nonfarm activities.

V. RESEARCH GAPS/ISSUES

The survey of the existing literature on the rural labor markets and rural nonfarm activities gave rise to a number of research issues and research hypotheses.

I. With regard to the nature and strength of linkages between different sectors, two important hypotheses relating to inter- sectoral linkages that need to be tested in the Philippine context emerge:

   (a) Expenditure or consumption linkages are larger relative to backward and forward linkages with other sectors.

   (b) Expenditure elasticities for many products of rural nonfarm enterprises are positive. Estimation and examination of these elasticities may be useful in identifying new and growing markets that will arise with increases in income.

II. Test the labor market links between agricultural and rural nonfarm activities in the Philippines.

   Recent studies (Hazell 1990; Ahmed and Hossain 1988) highlighted the labor market links between agriculture and rural nonfarm activities. An illustration of

this labor market link as cited by Hazell follows: In rural areas, rising farm wages tend to increase the opportunity cost of labor in nonfarm activities. This may induce a shift in the composition of nonfarm activity from very labor-intensive, low-return activities to more skilled, higher-investment, high-return activities. Thus, rising agricultural productivity may be instrumental in inducing a structural transformation of the rural nonfarm economy.

III. Research work is required on both the demand and supply sides of the rural labor market. Few attempts have been made to empirically estimate rural labor supply and demand relations in the Philippines. For instance, the labor supply studies focused on the implications of nonfarm employment for overall employment of the household labor force, household income levels, and distribution of total household income. Furthermore, there is still a need to determine the factors that may affect the type of nonfarm work as well as remuneration from rural nonfarm activities. It is likewise necessary to determine the characteristics of nonfarm labor demand like the type of employment available and level of skills required, among others. A need to investigate the adjustment mechanisms and the nature of lags and flexibilites in the process of rural wage and employment determination must be addressed. The foregoing analysis can be done with the use of information obtained from well-structured micro-level sample survey.

IV. Future study on the employment implications of investment in infrastructure must be conducted.

What are the effects of investments in rural infrastructure on farm and nonfarm wages, employment levels, labor productivity, and equity?

V. Construct and simulate dynamic models of the rural labor market.

However, one should note that the data requirements for dynamic model simulation are more stringent as time series of cross-sections is called for.

VI. A study to determine the impact of macro economic sector's policies on rural labor demand and supply, and therefore, on wages, employment, and labor productivity, should be undertaken.

VI. OBJECTIVES OF PROPOSED STUDY

The study on rural labor markets, rural nonfarm activities, and agrarian reform basically aims to determine the role that rural labor markets play in the development process as rural nonfarm activities grow. It attempts to answer the question: How does the growth and development of different types of rural nonfarm enterprises affect the rural labor markets? Answers to this question will be relevant in designing policies and programs that may influence the growth and development of rural nonfarm enterprises. The study also seeks to test the labor market links between agricultural and rural nonfarm activities in the Philippines. Recent studies (Ahmed and Hossain 1988; and Hazell 1990) highlighted the labor market links between agriculture and rural nonfarm activities. An illustration of this labor market link as cited by Hazell follows. In rural areas, rising farm wages tend to increase the opportunity cost of labor in nonfarm activities.

This may induce a shift in the composition of nonfarm activity from highly labor-intensive, low-return activities to more skilled, higher-investment, high-return activities. Thus, rising agricultural productivity may be instrumental in inducing a structural transformation of the rural nonfarm economy. The analysis of the labor market link will give light to the relationship between farm and rural nonfarm activities' earnings.

Significant agricultural policies like the Comprehensive Agrarian Reform Program are expected to have a major impact on wages, labor productivity, and employment levels in both farm and rural nonfarm sectors. It is necessary to determine the impact of agrarian reform on these variables before its full implementation to minimize the disruptive effects.

In connection with the aforementioned objectives, the study will first provide an analysis of the nature of rural labor markets in the Philippines. This will be done by looking at the demand and supply sides. The study will tackle the nature of the demand side of the rural labor markets, particularly the nature of nonfarm enterprises. In this regard, the following will be examined: range and diversity of nonfarm enterprises/activities; information on the types of nonfarm activities available in the area of study; characteristics of rural nonfarm enterprises like size, location, type of ownership, magnitude and composition of employment. The patterns of growth, changes in the structure, and determinants of growth of these enterprises will also be scrutinized.

The supply side of the rural labor markets will be tackled by assessing the factors that influence the decision to take nonfarm employment like personal characteristics and skill level; how household labor is allocated between farm and rural nonfarm activities; variables that influence the level of remuneration, etc.

To quantify the effects of labor demand and supply factors on wages, employment level, and labor productivity in both farm and rural nonfarm activities, an econometric model will be constructed. The model will also be used to determine the quantitative impact of agrarian reform and other major policies which may directly or indirectly affect farm and nonfarm variables.

The study will likewise review the methodologies used in several growth linkages researches conducted in India and Malaysia by the World Bank and the International Food Policy Research Institute. The evaluation of these methodologies will be done to determine the extent of their applicability to the Philippines and to identify the necessary data base.

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