The rural non-farm sector: issues and evidence from developing countries

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Abstract

The rural non-farm sector has traditionally been viewed as a low-productivity sector which produces low quality goods. It is often expected to wither away as a country develops. Recent years have seen a shift away from this position towards recognition that the rural non-farm sector can, and often does, contribute to economic growth, rural employment, poverty reduction, and a more spatially balanced population distribution. This paper reviews the literature on the conceptual and empirical underpinnings of this more recent perspective, focussing on the experience in developing countries. The paper documents the size and heterogeneity of the sector, pointing to evidence that in many countries the sector is expanding rather than declining. The issues associated with measuring the sector's economic contribution are discussed, followed by empirical assessments for several countries and regions. The distributional impact of non-farm earnings is examined and it is found that a pro-poor impact, while by no means inevitable, can be considerable. The sector's trajectory over time, in different settings, is reviewed and the scope for, and experience of, various policy interventions is discussed. © 2001 Elsevier Science B.V. All rights reserved.

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"... policy makers and planners charged with the formulation of policies and programs to assist rural small-scale industry in the Third World are often forced to make decisions that are 'unencumbered by evidence'." (Liedholm and Chuta, 1990, p. 327)

1. Introduction

The rural non-farm sector is a poorly understood component of the rural economy of developing countries and we know relatively little about its role in the broader development process. This gap in our knowledge is the product of the sector's great heterogeneity,

coupled with inadequate attention at both the empirical and theoretical level. A common view is that rural off-farm employment is a low productivity sector producing low quality goods, expected to wither away as a country develops and incomes rise. A corollary of this perspective is that government need not devote resources to promoting the sector, nor be concerned about negative repercussions on the rural non-farm sector arising from government policies directed at other objectives.

To some extent, opinion has been swinging away from this position. Arguments for paying attention to the non-farm sector generally center around the sector's perceived potential in absorbing a growing rural labor force, in slowing rural–urban migration, in contributing to national income growth, and in promoting a more equitable distribution of income.

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In most developing countries the bulk of the population lives in rural areas, and this population continues to grow at a substantial rate. Given limits to arable land, this growth in the rural labor force will not be productively absorbed in the agricultural sector. Either migration to urban areas or the development of non-farm employment in rural areas must take up the slack.

Most countries have seen a rapid increase in the level of urbanization. Over the period 1960–1980, rural out-migration and urban in-migration have been estimated at 1 and 1.8% annually for 40 developing countries with available data (Williamson, 1988). For some countries the rates have been much higher. For example, during the 1970s, Nigeria and Tanzania are estimated to have had 7.0 and 7.5% increases in urban population annually with over 60% due to rural–urban migration (Todaro, 1994).

Enterprises tend to congregate in urbanized areas in most countries, and to be large in scale, suggesting that there are substantial economies of scale, scope or agglomeration. A large local market, a locally available skilled workforce, a wider variety of production inputs, technological spillovers and lower costs to the provision of infrastructure are a few examples of the latter and they are real (social) benefits of concentration.

There are, however, reasons for industry to thrive in urbanized environments which do not reflect benefits to society. Some of these are created by governments. Requiring firms to obtain licenses for production or foreign exchange makes it advantageous for them to locate near government offices. The provision of high quality physical and social infrastructure in urban areas to an extent not warranted on the basis of lower costs is a phenomenon commonly observed in developing countries (and often ascribed to the presence of a political elite in cities). This lowers the relative costs of urban-based production in a way which is socially costly.

Perhaps most important, however, in causing a divergence between private decision-making and social benefits is the fact that firms do not incorporate most of the negative externalities, such as congestion, pollution and higher land values, that they impose when they decide to locate in a city. Most governments have voiced concern about this increasing concentration in UN surveys and many have expressed an interest in promoting economic activity in rural areas to encourage the population to stay in the countryside. This concern is shared by donor agencies and particularly non-governmental organizations (NGOs) who have become active in programs of credit, training and technical assistance to both rural and urban small-scale enterprises (see Meyer, 1992, 1998 and Section 5). [1]

In addition to the problems of urbanization, it has been argued that rural enterprises are more productive, when appropriately measured, than are urban firms. Just as private location decisions need not be optimal from the perspective of society as a whole, production technology choices at the level of the firm can also be governed by incentives at odds with social priorities. It is often pointed out that for a number of reasons, often artifacts of government policies, relative factor costs diverge between rural and urban areas. The factor costs faced by rural-based enterprises are thought to more accurately reflect the social opportunity costs of those factors and hence the labor-intensive technologies used in rural locations are more socially "appropriate". That is, they are more productive when inputs are measured in terms of their real, social, costs. Even if such activities do not generate very high labor income, in an environment with seasonal or permanent underemployment, any utilization of labor can contribute to raising total income. The oft-cited example of China's labor-intensive township and village enterprises (TVEs) as the "engine of growth" behind that country's remarkable growth performance during the past decades, suggests that even at conventional market prices the potential contribution of the sector to overall economic performance should not be underestimated.

Finally, there are distributional reasons to be interested in the non-farm rural sector (given that redistribution via taxes and transfers is politically and administratively costly in all countries). First, to the extent that rural industry produces lower quality goods which are more heavily consumed by the poor, good health of this sector has indirect distributional benefits via lowering prices to the poor. Second, it can provide

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[1] It has been suggested that the Employment Guarantee Scheme in the Indian State of Maharashtra, which provides employment to the rural population in public works projects, is willingly bankrolled by the urban population of the State (residing mainly in Mumbai, formerly Bombay) in an effort to stem further rural to urban migration (see Section 5 for further discussion).

a source of employment to the poor who, because they are small landholders or are landless, cannot find sustenance in agriculture. Third, through diversification it also supplies a way of smoothing income over years and seasons to people who have limited access to other risk coping mechanisms such as savings/credit or insurance. Fourth, growth in the non-farm sector can tighten agricultural labor markets, raising wages and/or reducing underemployment. As rural poverty in many countries is concentrated among landless agricultural laborers this tightening of labor markets can have a pronounced impact on poverty levels. [2]

Evidence concerning the productivity and distributional characteristics of the sector is examined in turn in Sections 2 and 3. Section 4 considers the dynamic potential of the sector, and in conclusion, Section 5 examines the role for policy. But first we look at some aggregate statistics which demonstrate that, while perhaps not the center of attention, the rural non-farm sector is large, and even growing, in most developing countries.

1.1. Overview of the non-farm sector

The non-farm "sector" includes all economic activities in rural areas except agriculture, livestock, fishing and hunting. Since it is defined negatively, as non-agriculture, it is not in any sense a homogeneous sector. Judgements about the viability and importance of the rural non-farm sector hinge crucially on what is meant by "rural". We will illustrate in this paper, e.g., non-farm activity undertaken by farm households as independent producers in their homes, the subcontracting of work to farm families by urban-based firms, non-farm activity in village and rural town enterprises, and commuting between rural residences and urban non-farm jobs. For example, Basant (1994) finds, in a survey of rural employment in the Indian State of Gujarat, that 25% of rural male non-agricultural workers commuted to urban areas for work.

Many different definitions of rural are used in the collection of census and survey information, making comparisons across countries difficult. Typically the distinction between rural and urban employment is based on the place of residence of workers, so those who commute to a job in a nearby urban center are considered to be rural workers. Rural is most often defined to include settlements of about 5000 or fewer inhabitants. However, the definitions of a rural locality, based on population size and/or functions and characteristics of the settlement such as whether it has a school or hospital, or happens to be the seat of local government, do vary. For example, in Table 1 , which displays aggregate statistics for a number of countries based on their own definitions of rural, the definitions range from Mali and Zimbabwe, which designate as rural only settlements with less than 3000 and 2500 inhabitants, respectively, to Mauritania, which includes settlements with under 10 000, to Taiwan, which excludes only cities over 250 000 and two suburban counties surrounding Taipei (for further definitions, see Haggblade et al., 1989). Clearly, a more limited definition of rural lowers the percentage of employment which is found outside of agriculture. [3]

A number of features of the data suggest that the percentage of rural employment found in the non-farm sector may be underestimated for all countries. The figures in Table 1 refer in most cases only to primary employment. As will be discussed below in Section 3, one of the important roles of non-farm activities is to provide work in the slack periods of the agricultural cycle. Thus primary employment status will be an underestimate of the actual percentage of labor hours which are devoted to non-farm activities. After surveying farm management surveys and time allocation studies of African farm households, Haggblade et al. (1989) conclude that 15–65% of farmers have secondary employment in the non-farm sector and 15–40% of total family labor hours are devoted to income-generating non-farm activities. Note that this is income-generating activities. Much of non-farm activity in all developing countries, especially that of women, is unremunerated work, such as clothing production, food processing and education for the household, which is not included in employment figures. As countries develop, more of these tasks are commercialized and more non-farm employment

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[2] World Bank (1997a) indicates that much of the reduction in rural poverty in India during the 1970s and 1980s could be attributed to rising agricultural wage rates (see also Lanjouw and Shariff, 2000).

[3] The perceived contrasting experience of "rural development" in East Asia versus Latin America, e.g., might be at least in part influenced by the definition of rural which is being applied.

Table 1
Aggregate statistics on the non-farm sector[a]

Country	Percentage of rural employment which is non-farm			Sectoral breakdown				Percentage of income from non-farm
	Total	Male	Female	Mining and construction	Manufacturing	Commerce and transportation	Services	
Asia								
Bangladesh (1982)	25%			12%	39%	25%	24%	8%
Bangladesh (1981)	29							
Bangladesh (1991)	34				39%	35%	11%	
China (1980)	11				55		28	
China (1986)	20				42		27	
India, All (1981)		18		9%	37%	26%	29%	
			11	8	54	11	27	
India, All (1991)		20		9%	30%	28%	33	
			10	5	50	11		
India								
Bihar (1991)		13	6					
Kerala (1991)		44	44					
Punjab (1991)		14	43					
Uttar Pradesh (1991)		25	8					
West Bengal (1991)		26	27					
India, (1994)								34%
Indonesia, Central Java (1985)	37	–	–	–	30			
Malaysia (1970)	34	38	28		5			
Malaysia (1980)	49	53	42		10			
Pakistan (1982/1983)	32				9			
Philippines (1971)	32							55%
Philippines (1985)	33				7 (1982)			56%
Sri Lanka (1981)	46				8			
Taiwan (1966)	47			3	23	16	44	
Taiwan (1980)	67							
Thailand (1985)	31				5 (1983)			
Vietnam (1993)[b]	70							
Africa								
Burkina Faso (1982/ 1985), Sahelian zone								52%
Cameroon (1976)	8%	13%	3%	11%	30%	20%	39%	
Egypt (1997)								50
Ghana (1987)[b]		37	46					
Ghana (1991)[b]		30	42					
Kenya (1976)								28
Malawi (1977)	9	15	3	19	30	28	23	
Mali (1976)	6	4	15	2	61	14	23	
Mauritania (1977)	21	–	–	7	18	34	41	
Nigeria (1966), W. State	60	20	97					
Rwanda (1978)	5	9	1	22	23	14	40	
Senegal (1970/1971)	18	–	–	7	34	38	21	
Sierra Leone (1974)	14	15	12	13	20	45	21	36
Tanzania (1975)								23
Uganda (1992)[b]		40	15					
Uganda (1996)[b]		46	35					
Zimbabwe (1982)	19							
Zambia (1985)	24		∼66					

Table 1 (*Continued*)

Country	Percentage of rural employment which is non-farm			Sectoral breakdown				Percentage of income from non-farm
	Total	Male	Female	Mining and construction	Manufacturing	Commerce and transportation	Services	
Latin America								
Bolivia (1997)		18	16					
Brazil (1990)		26	41					
Brazil (1997)		24	30					39
Chile (1990)		19	67					
Chile (1998)		26	65					41
Colombia (1991)		31	71					
Colombia (1997)		33	78					50
Costa Rica (1990)		48	87					59
Costa Rica (1997)		57	88					
El Salvador (1994)	36	25	72					
El Salvador (1997)		33	81	14	28	31	26	
Ecuador (1995)[b]	43	37	50	10	22	37	23	41
Honduras (1990)		19	88					38
Honduras (1998)		22	84					
Mexico (1989)		35	69					
Mexico (1996)		45	67					
Panama (1989)		25	86					
Panama (1998)		47	93					50
Venezuela (1990)		34	78					
Venezuela (1994)		35	87					

[a] Sources: Adams (1999), Anderson and Leierson (1980), Byrd and Lin (1990), Chandrasekhar (1993), Haggblade et al. (1989), Hossain (1984), Islam (1987), Lanjouw and Shariff (2000), Milimo and Fisseha (1986), Newman and Canagarajah (1999), Ranis and Stewart (1993), Reardon et al. (1992, 2001), Sandee and Weijland (1989), Government of India (1992), van de Walle (2000), World Bank (1996, 1997a,b).

[b] Refers to non-farm employment as primary or secondary occupation.

appears in the statistics (although the problem never disappears, see Thomas, 1992). This is a second reason to expect an underestimate of non-farm activity. Finally, since rural enterprises are typically small and dispersed there is reason to think that they may simply be missed in surveys. (Anderson and Leierson, 1980, note that in some African countries under-remuneration has been as high as 40%.)

Bearing these considerations in mind, it is clear from Table 1 that the non-farm sector is substantial in many countries — both in terms of income and employment — and has, in the aggregate, been growing over time. For example, in China non-agricultural employment grew from 11% of total rural employment in 1980 to 20% by 1986.[4] As indicated in Table 1,

the non-farm sector is composed of services, commerce and transport, construction and mining, and manufacturing. There is some evidence to suggest that there is a shift in composition towards services and away from manufacturing in the smallest localities as development proceeds (see below).

2. Characteristics of the non-farm sector — productivity

2.1. Measures of productivity — theory

An important question when considering the potential contribution of non-farm activity to development is whether such activity is efficient in converting resources into output relative to its urban counterpart or agriculture. In studies of productivity three measures are commonly used. The first two are partial

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[4] Aoki et al. (1995, p. 40) argue that the East Asian success in utilizing cheap labor in rural areas, in sectors outside of traditional farming, was "one of the most important elements of East Asian development" (see also Hayami, 1997).

measures: labor productivity, which measures the value added by an activity (gross output deducting intermediate inputs, but not deducting capital and labor costs) per unit of labor input, and capital productivity, which measures the value added per unit of capital input. By making comparisons based on one of these partial productivity measures, say labor productivity, one is implicitly treating the other input, capital, as having a zero opportunity cost. If both resources are scarce, then one must turn to an aggregate productivity measure such as the social benefit/cost ratio. This measure expresses value-added relative to the weighted sum of labor and capital productivities with weights based on their social opportunity costs. Of course, if one activity has both higher labor productivity and higher capital productivity then switching resources to it will increase the overall output of the economy. Typically, however, higher labor productivity comes at the expense of lower capital productivity as the amount of capital per worker is increased, and hence an aggregate measure is necessary.

The assessment of opportunity costs (either private or social — shadow — costs) is important in comparing productivity across activities. While commonly an average agricultural or urban wage is used to value labor and some common interest rate is chosen to value capital, in fact opportunity costs, both private and social, will typically not be reflected in these prices and are likely to vary across localities, households, gender, and so on. For example, in a situation with minimum wage legislation or wage rigidity leading to unemployment, it is often preferable to assume that labor has a zero opportunity cost — despite positive market wages. It may be quite difficult to know what wage or interest rate reflects the true opportunity cost of labor or capital inputs in any given situation. It is not always clear, e.g., that capital has a high opportunity cost even when credit is very expensive. Where there are large transaction costs in financial markets, the interest rate for someone attempting to borrow may be vastly higher than the potential returns available to the same individual if he has some small savings. If the financial markets are so imperfect that it is not possible to invest savings except in one's own enterprise then labor use and capital use are linked. The prevalence of self-employment using exclusively own (or family) capital in rural non-farm activities, combined with very rudimentary or non-existent savings

institutions in many rural LDC contexts, suggests that this may often be the case. For example, a survey of rural enterprises in El Salvador found that only 7% received start-up finance from formal sources. The vast majority of firms (70%) were started using personal savings (Lanjouw, 2001).[5] Under these circumstances the opportunity cost of the use of savings is zero and labor productivity would be an appropriate measure of total productivity (see also Vijverberg, 1988; Banerjee, 1996; Banerjee and Munshi, 2000).

A systematic divergence between private and social values is used to argue in favor of government promotion of certain sectors or technology choices, e.g., policies to support small-scale enterprises (SSEs). It is claimed that SSEs are more labor intensive and that the lower labor and higher capital prices faced by small-scale firms correspond more closely to the inputs' true relative scarcities (see Section 4). For this reason, the relative factor proportions in smaller enterprises are more 'appropriate' and they should be encouraged. Since rural firms tend to be more concentrated in the smaller-sized categories this argument would apply to the rural/urban distinction as well. (Much of the information available on productivity is with respect to the small-scale versus large-scale distinction rather than rural/urban, and concerns manufacturing.) In the productivity data which follow we shall see that there is a wide range of productivity levels across activities in the rural non-farm sector. How these are evaluated depends on an assessment of social opportunity costs.

2.2. Measures of productivity — empirical

It is commonly found that small-scale enterprises generate more employment per unit of capital than do large-scale enterprises (except for, perhaps, the smallest units). However, they do not always succeed in producing higher output with greater inputs. In a survey of the literature on this issue, Uribe-Echevarria (1992) notes that, contrary to popular belief, small-scale firms have often been found to be inefficient users of capital. Little et al. (1987) summarizes the results of studies in several countries (rural and urban). They

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[5] Reardon et al. (1994) provide evidence that when credit markets do not function, non-farm income is a key source of finance for investment into agriculture.

conclude that in general there is not a linear relationship linking either capital per worker or capital productivity to firm size, when size is measured by employment. It is medium-sized firms (employment over 50) which tend to have the highest capital productivity. Little et al. (1987) notes, however, that in their own investigation of Indian data, when enterprises are ordered by capital size, the expected relationships hold: the smallest firms are more labor intensive, have lower labor productivity and higher capital productivity.

The choice of technology can be crucial to levels of labor and capital productivity. This can perhaps be brought out most clearly in an example based on Ahmad (1990). Paddy husking is a leading rural industry in Bangladesh and until the 1960s, almost all husking was done using the traditional *dhenki* technique (a large mortar and pestle device operated by at least two persons). A newer alternative is small rural mills which use steel hullers driven by diesel or electricity, also operated by two or three persons. Larger variants also exist, including modern automatic integrated mills employing as many as 30 persons. The first rows of Table 2 show the increase in the number of mechanized

mills and the concomitant fall in *dhenki* operations over three decades, encouraged by an expansion of electricity into rural areas at low prices. It is clear that the shift from *dhenki* husking to mechanized methods lowers total employment: two persons operating a *dhenki* can husk 1.43 maunds of rice per day compared to 124 maunds produced by the 30 workers in a large mill. The capital/labor ratio for the *dhenki* technique is much lower than for the mechanized methods. The relationship is not monotonic as the larger mills, while using more capital than small mills, provide more employment and have a lower capital/labor ratio than the small mills. Capital productivity, VA/FC, is highest for *dhenkis* but large mills provide the highest profit rate on capital and have the lowest per maund cost of processing. Note that this is subtracting the cost of labor at some positive value, probably the agricultural wage, and at this wage *dhenkis* yield negative profits. If a shadow value of labor of zero were appropriate then the VA/FC ratio is the best indicator of social productivity and the *dhenki* technology appears superior.

Using data from Sierra Leone, Honduras and Jamaica collected in the late 1970s, Liedholm and Kilby (1989) address the question of the relative profitability of *rural* small-scale firms versus their large-scale urban counterparts specifically. (Small scale is less than 50 employees.) They calculate social benefit/cost measures for enterprises in different industries including baking, wearing apparel, shoes, furniture and metal products. The shadow price of capital was assumed to be 20%, unpaid family labor was (conservatively) valued at the level of wages in the small-scale sector for skilled workers, and labor in urban firms was valued at 80% of actual wages (with the latter based on survey estimates of minimum wage distortions, see Haggblade et al., 1986). In over two-thirds of the industries, the social benefit/cost ratios for the small-scale firms were greater than 1 and higher than the ratios for the urban firms in the same country and industry. The social benefit/cost ratios for the large urban firms were often less than 1, i.e., their production actually decreased social welfare. Similar results were obtained for industries where output could be valued at world prices, which reflect shadow values.

It is clear that the non-farm (or small-scale) sector is very heterogeneous, comprised of activities with a

Table 2
Characteristics and productivity of husking technologies (source: Ahmad, 1990)

	Dhenki	Small huller mill	Large huller mill
Percentage of crop husked by			
1967	83%	17%	–
1977	65–75	2–25	5–10%
1981	60–65	25–30	10
Employment, *L* (No.)	2.6	2.5	20.5
Percent family	62%	19%	18%
Percent female	100	9	4
Fixed capital, FC (Tk)	3285	85832	453667
Working capital (Tk)	816	2456	108479
Value added, VA (Tk)	7445	37964	426347
Net yearly profit, NP (Tk)	Negative	22066	281412
FC/*L* (Tk)	1263	34333	22130
VA/*L* (Tk)	2863	15186	20797
VA/FC	2.27	0.44	0.94
NP/FC	–	0.26	0.62
Paddy husked per 8 hour day	1.43	50.72	124.12
Per maund cost of husking (Tk)	27.40	4.04	3.50

wide range of labor and capital productivities. One can think of two rather different groups of occupations: low labor productivity activities serving as a residual source of employment, and high labor productivity (and hence income) activities. In a study of Java, (while) "owners of brick and coconut plants cleared five times as much as a successful farmer, daily wages in some seasonal work would not purchase 100 g of rice" (Alexander et al., 1991). On the other hand, Du (1990) reports that the average annual per capita income in (rural) town and village enterprises (TVEs) in China was Y726 in 1985 versus Y351 in agriculture. A study of two regions in Uttar Pradesh, India, in 1985 found value-added per worker ranging from about 600 rupees per year in oil crushing to over 11 000 in cane crushing (Papola, 1987). Hossain (1984) details daily wage rates and capital/labor ratios for 14 major cottage industries in Bangladesh (see Table 3). Six of the 14 activities yield daily wages which are lower than the agricultural daily wage (12.24 Tk) while the higher productivity activities, such as carpentry and handloom weaving, generate daily wages over 50% above the agricultural wage. The table also shows a positive relationship between capital per worker and wages and a negative relationship between female workers and wage rates. Controlling for educational and other personal characteristics, Lanjouw (1999) finds that women are

significantly more likely than men to be employed in low-income non-agricultural activities in Ecuador.[6]

3. Characteristics of the non-farm employment sector — inequality and poverty alleviation

As described in the previous section, some activities in the non-farm sector provide workers with low returns even relative to casual agricultural wage labor. This is particularly true for non-farm labor performed by women. Such employment may nevertheless be very important from a welfare perspective for the following reasons: off-farm employment income may serve to reduce aggregate income inequality; where there exists seasonal or longer-term unemployment in agriculture households may benefit even from low non-farm earnings; and for certain subgroups of the population which are unable to participate in the agricultural labor market, non-farm incomes offer some means to economic security.

It is impossible to say with confidence whether the opportunity to engage in non-farm activities is income inequality increasing or decreasing without information about what the situation would have been in the absence of such occupations. Nevertheless, there is a strong presumption that if the bulk of non-farm incomes goes to the richer segments of society then it is inequality increasing. Of course, even if non-farm jobs widen the distribution of income, this does not necessarily mean that the poor do not benefit at all.

The empirical evidence is mixed.[7] In some cases one sees the poorer/landless getting a higher percentage of their income from non-farm occupations suggesting an equalizing influence and poverty alleviating role (see, e.g., studies of Japan, South Korea, Kenya, Botswana, Nigeria, the Gambia, and Egypt in Bagachwa and Stewart, 1992; White, 1991; Adams, 1999). In a decomposition of income inequality by factor components for Ecuador as a whole, Elbers and Lanjouw (2001) finds that a marginal scaling-up of rural non-agricultural incomes is inequality reducing, although the elasticity is small. Within rural areas

Table 3
Labor productivity, capital intensity and female participation (1979/1980) (source: Hossain, 1984)

Industry	Capital per worker (Tk)	Value added per labor day (Tk)	Percentage of female workers
Tailoring	4982	27.51	20.4
Dairy products	3076	23.42	9.8
Gur making	711	20.02	Nil
Carpentry	3009	19.88	4.4
Jewelry	1283	18.67	2.1
Blacksmithy	760	15.77	2.4
Handloom weaving	1594	15.07	37.6
Oil pressing	1006	12.58	42.5
Pottery	799	11.76	47.0
Paddy husking	303	7.38	56.0
Bamboo products	313	5.22	49.0
Mat making	465	5.21	62.8
Fishing nets	265	4.78	63.3
Coir rope	145	4.07	64.3

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[6] Similar patterns have been observed in Brazil (Ferreira and Lanjouw, 2001), India (Lanjouw and Shariff, 2000), and El Salvador (Lanjouw, 2001).

[7] For a recent review of the literature, see Reardon et al. (2000).

alone, however, the effect is to raise inequality slightly. A similar analysis in rural areas of two provinces of China (Jiangsu and Sichuan) finds that off-farm income is inequality increasing (Burgess, 1997). A longitudinal study of Palanpur, a village in north India, documents that the distributional impact of non-agricultural employment opportunities has shifted from equalizing to disequalizing over time (Lanjouw and Stern, 1998).

Several studies show that the relationship between the share of non-farm income and total income or assets is U-shaped. This fits with the residual employment/productive sector dichotomy, with better off households (either ex ante or ex post) involved in the latter. Hazell and Haggblade (1990) presents Indian data which show that in the mid-1970s the wealthiest and poorest households (per capita) had the highest shares of income from non-farm sources, business income in the case of the rich and wages for the poor. But in many other studies researchers have observed that the share of non-farm income rises monotonically with overall income levels. White (1991) finds land-rich households receiving the largest returns from non-farm enterprises in Java. In Kutus Town, Central Province, Kenya, a survey of 111 farm households found that the wealthier benefited most from earning opportunities outside agriculture with the richest quartile receiving 52% of income from non-farm sources compared to 13% for the lowest quartile (Evans and Ngau, 1991). Reardon et al. (1992) found a similar result for Burkina Faso, with total household income strongly positively correlated with the share of income derived from non-farm sources. A recent study of Vietnam found that the lowest level of poverty in rural areas is among households whose income stems solely from off-farm self employment (van de Walle, 2000). Similar findings are reported for Ecuador (Lanjouw, 1999), El Salvador (Lanjouw, 2001) and Brazil (Ferreira and Lanjouw, 2001). In the Indian village of Palanpur mentioned above, the poor have not been direct beneficiaries from an expansion of employment opportunities outside the village — the better educated in the village have tended to secure the available non-farm jobs. However, the poor in Palanpur are likely to have benefited indirectly: despite a rapidly growing population and a fixed amount of village land, real agricultural wages have risen steadily over the past two decades, the consequence of technological change in agriculture

but also the withdrawal by some villagers from the agricultural labor market due to new employment opportunities (Lanjouw and Stern, 1993, 1998). Unni (1997) reports that social status (proxied by caste) in rural Gujarat, after controlling for education and other personal characteristics, exercises an important, independent, influence on access to high-productivity non-agricultural occupations. Once again, the relatively disadvantaged appear to face barriers to employment in the most attractive non-agricultural jobs. In a survey of African field studies, Reardon (1997) also points to important barriers to employment in non-farm activities. These barriers clearly may dampen the potential of the sector to alleviate poverty.

Where individuals are involuntarily unemployed, i.e., looking for agricultural employment at the prevailing wage rate but not finding it, then the agricultural wage is not the opportunity cost of labor. There is evidence from India that agricultural wages are rigid and that this situation persists even in the peak seasons. The following two studies, cited in Dasgupta (1993) are indicative. Analyzing household survey data from West Bengal, Bardhan (1984) estimated that unemployment among male casual workers was 8–14% in peak and 23% in slack seasons, and for female casual workers 20% in peak and 42% in slack seasons. Data from six villages in the semi-arid regions of India (ICRISAT) in the mid-1970s yields average estimates of unemployment (based on frustrated job search) for males of 12 and 39% in the peak and slack periods, and 11 and 50% for females, respectively (Ryan and Ghodake, 1984). There are many theories as to why wages should be inflexible including various efficiency and nutritional wage theories, imperfect information theories, and resistance on the part of workers themselves (see Dasgupta, 1993; Datt, 1996; Drèze and Mukerjee, 1989). With involuntary unemployment of agricultural laborers, even low wage employment outside of agriculture may be very crucial in raising the living standards of the poorest, particularly those who do not have other resources, such as family, to fall back on.

In many countries the ability of women to work outside the home is limited. Thus their opportunity cost of time also bears little relation to the agricultural wage, and for the poor, may be very low. Where data are available, Table 1 indicates that non-farm employment is important to women in many countries

(and as noted, the figures are likely to be particularly underestimated for women).

Cottage industry, where work is performed in the home, is particularly useful from the point of view of mixing with other activities, such as preparing food and caring for children. A study of 11 villages in Bangladesh in 1979/1980 (Hossain, 1984) found that employment in cottage industries was close to a full-time occupation for men in many activities while it was most often a part-time occupation for women — despite the fact that women rarely worked in agriculture (the main exception being pottery where women are engaged full-time). The activities which have a majority of women workers are those located inside the home — rice husking, mat making, coir products and net making — where participation does not require breaking social customs. Studies also show African women dominating activities which can be undertaken in the home. Examples are beer brewing in Botswana, Burkina Faso, Malawi and Zambia; fish processing in Senegal and Ghana; pottery in Malawi; rice husking in Tanzania and retailing and vending in general (Bagachwa and Stewart, 1992). In the Sierra region of rural Ecuador, the town of Pelileo has become well known for its tailoring activities. Up to 400 small enterprises, mostly households sub-contracted to a larger firm, are located in and around the town and are engaged in jeans tailoring. Most of the family firms are operated by women and children, supplementing their households' agricultural income. A family operation with five members working full-time might expect to earn weekly profits of around $200 (World Bank, 1996).

The peaks and troughs in labor demand from agriculture leave many people in rural areas seasonally unemployed. As a result, much of non-farm employment is secondary. In the slack season there may not be any agricultural employment so even a low productivity occupation can be useful in raising and smoothing income over the year. On the other hand, it is important to realize that the types of employment available on a seasonable basis are limited. Capital (both human and physical) intensive activities are not likely to be undertaken seasonally because it leaves capital underutilized during the agricultural peak season. This in turn means that labor productivity will rarely be very high.

In addition to smoothing the flow of income received by agricultural households over the cropping cycle, non-farm income may stabilize total income by spreading risk through diversification. A smoother flow of income directly increases welfare at a constant level of expected income (making the standard assumption that utility functions are concave in consumption). It is common to see households deriving income from multiple sources. In China, for instance, most TVE workers retain rights to agricultural land and many work part-time in farming (Du, 1990). Both seasonal smoothing and risk diversification can be very important in environments where agricultural output varies greatly over the year and across years and where mechanisms for smoothing income, such as credit and transfers, are costly or absent. The fact the villagers are concerned about risk is indicated in a study by Morduch (1993) of 10 Indian villages in the semi-arid tropics (ICRISAT) over the period 1976–1984. He found that households which were estimated to be more constrained in their ability to obtain consumption credit when faced by a bad harvest were more likely to minimize the possibility of a bad harvest in the first place. They scattered their plots more widely and chose a more diversified cropping pattern.

The opportunity to earn non-farming income can lead to higher average agricultural incomes in two ways. First, if there are several production technologies or crops, with higher average productivity being associated with greater variability in output, then having an alternative source of income which does not fall with a bad agricultural outcome makes farmers more willing to choose the high risk/high return options. (A similar rationale is posited to explain why larger, wealthier farmers are often observed to be the first to adopt new agricultural technologies.) Furthermore, in the absence of low cost credit, additional income from outside farming facilitates the purchase of costly inputs when they are required to take advantage of high return options. Using data on smallholder agriculture in Kenya, Collier and Lal (1986) found that crop output was significantly related to non-crop income and liquid assets after controlling for production inputs. This suggests that wealthier and more diversified farmers were making higher productivity cropping choices. It was found, moreover, that non-farm income not only contributed directly to household resources available for input purchases but was also important for obtaining credit. In another study of Kenya, the

town of Kutus, Evans and Ngau (1991) found that farm revenue is positively associated with the proportion of land devoted to coffee (versus maize) controlling for input costs, and that the proportion of land given to coffee is positively associated with non-farm revenue. It is informative that even the wealthiest farm families still diversify risk by continuing to grow maize.

Of course, to the extent that the non-farm sector depends on demand derived from local agricultural incomes, it will covary and will only effectively smooth idiosyncratic risk. For example, the North Arcot district of Tamil Nadu suffered a severe drought in 1982/1983 with a fall in over 50% from normal rice yields. Non-farm business income also plummeted as a result. For non-agricultural households in the surveyed villages, average non-farm business earnings were 493 (1973/1974) rupees) in 1973/1974, fell to 19 rupees in 1982/1983 and rebounded to 1094 by the following year (Hazell et al., 1991a). Clearly in this case non-farm income was very sensitive to levels of agricultural income. On the other hand, Reardon et al. (1992) reports that for three regions in Burkina Faso, the ratio of the coefficient of variation of total income to the coefficient of variation of cropping income was 0.61, 0.76 and 0.69, indicating that total income was considerably more stable than cropping income alone (see also Reardon and Taylor, 1996). Similarly, Lanjouw and Stern (1998) shows that in the north Indian village of Palanpur, the expansion of non-agricultural employment opportunities has accompanied a fall in the degree to which household incomes in the village covary. In most situations, non-agricultural income will probably be a stabilizing force.

4. Dynamic potential

In the 1960s, Hymer and Resnick (1969) formulated a model to explain the purported decline of rural non-farm activities under colonialism. They envisaged an initially self-sufficient economy producing both agricultural goods and other goods and services, labeled Z-goods, for local consumption. With the advent of colonial links there would arrive, on one hand, new opportunities for exporting cash crops and natural resources, and on the other, cheap and higher quality manufactured goods available from the outside world. Both the competition from imports and the drawing off of labor into the growing cash crop sector would stifle rural non-farm activity. Ranis and Stewart (1993) extended this model by positing a two part Z-goods sector, with part of the sector engaged in producing traditional goods and services in households and villages (the low productivity activities seen above) and the other composed of more modern activities which are more often located in towns. Location models in the new economic geography literature allow for the two-way flow of goods — not only from urban producers to rural consumers but also from rural producers to urban consumers. Firm locational choices and the degree of spatial concentration are determined by scale economies, factor mobility and transport costs. Changes in concentration are typically modeled as the result of changes in transport costs (see Krugman, 1998, for an overview).

In the mid-1970s, John Mellor stated an influential and optimistic position regarding the role of rural non-farm activity in a set of proposals for India (see also Mellor and Lele, 1972; Johnston and Kilby, 1975, for early contributions). As a result of emerging green revolution technologies he saw a virtuous cycle emerging whereby increases in agricultural productivity and thus the incomes of farmers would be magnified by multiple linkages with the rural non-farm sector. These were production linkages, both backward, via the demand of agriculturalists for inputs such as plows, engines and tools, and forward, via the need to process many agricultural goods, e.g., spinning, milling, canning. Consumption linkages were also thought to be important. As agricultural income rose, it would feed *primarily* into an increased demand for goods and services produced in nearby villages and towns. Furthermore, there were potential linkages through the supply of labor and capital. With increased productivity in agriculture either labor is released or wages go up and the new agricultural surplus would be a source of investment funds for the non-farm sector. To complete the cycle, growth in the non-farm sector was expected to stimulate still further growth in agricultural productivity via lower input costs (backward linkages), profits invested back into agriculture, and technological change. Thus growth in the two sectors would be mutually reinforcing with employment and incomes increasing in a dispersed pattern.

The following section surveys empirical work which attempts to determine whether there is a

positive feedback effect of agricultural growth on the rural non-farm sector, and if so, how important the various linkages are. This line of inquiry has been supported by an interest in calculating cost/benefit analyses of agricultural investments which capture the full set of regional impacts. Of course, a finding that agricultural growth spurs the rural non-farm sector does not, by itself, mean that the agriculture should be targeted, nor does an absence of linkages mean that it should *not* be targeted.

4.1. Intersectoral linkages

The empirical investigations are of two types. The first includes econometric estimates of the relationship between growth in agricultural income and growth in employment or income in the rural non-farm sector. These use cross-section or pooled data and so suffer from the fact that both sets of growth rates may differ across regions for many reasons, introducing noise which may swamp any relationship which exists. Furthermore, as emphasized above in Section 2, there are high and low wage occupations in the non-farm sector. As agricultural productivity grows, one would expect the residual employed in the non-farm sector to be drawn into agriculture, lowering employment in the non-farm sector but raising wages there. On the other hand, if the linkages are operating, higher demand for non-farm products and investment in the non-farm sector would lead to higher wages and might draw labor out of agriculture and increase employment in that sector. It is impossible to predict a priori whether non-farm employment should grow or shrink with agricultural productivity although in either case wages should rise. In addition, as emphasized by Ranis et al. (1990), the direction of causation is not clear. They cite evidence from the Philippines that suggests that the presence of modern (although not traditional) non-farm enterprises has a positive influence on agricultural productivity.

Vaidyanathan (1983) estimated a regression of the importance of non-agricultural employment in total employment on farming income, its distribution, the importance of crash crops and the unemployment rate, using several state-level data sets for India. In all cases he found a strongly significant, positive relationship between unemployment and the importance of non-farm employment. Where agriculture

was unable to provide widespread employment, the non-farm sector played an important role in picking up part of the slack. The incidence of non-farm employment was also found to be positively associated with both higher farm incomes and a more equal distribution, pointing to consumption linkages. Average daily wage rates in non-agriculture are found to be highest in states with high agricultural daily wages, as expected, a relationship which is confirmed in more disaggregated district level (Hazell and Haggblade, 1990) and village level (Lanjouw and Shariff, 2000) studies. Overall, wage rates in the rural non-farm sector were found to be higher than the agricultural wage so the low productivity residual activities do not dominate the sector — although one might expect such occupations to be under-enumerated due to their seasonal and self-employed character.

Hazell and Haggblade (1990) used state and district level Indian data to look at the relationship between rural non-farm income and total agricultural income interacted with factors thought to influence the magnitude of the multiplier: infrastructure, rural population density, per capita income in agriculture and irrigation. The estimations were done for rural areas, rural towns (urban <100 000), and the combined area. They calculate that on average a 100 rupee increase in agricultural income is associated with a 64 rupee increase in rural non-farm income, with 25 rupees in rural areas and 39 in rural towns. All of the interaction terms, except irrigation, increase the multiplier as expected. In another study in India, the North Arcot district in Tamil Nadu, a 1% increase in agricultural output was associated with a 0.9% growth in non-farm employment (IFPRI, 1985).

The second type of investigation uses social accounting matrices (SAMs) to calculate growth multipliers from certain structural relationships among agents in the economy. SAMs trace the circular flow of income and expenditure, on one hand, and goods and services, on the other, among households, firms, the government and the rest of the world. These multipliers can easily be decomposed into portions attributable to the various linkages. One can address in a detailed manner the question of how income distribution effects the magnitude of local linkages. The main drawback of SAM multipliers is the detailed data required for their calculation. SAMs require a (marginal) input/output table; an account of who receives income, both factor

incomes and net transfers; and information on the marginal expenditure patterns of all agents. When supplies are not infinitely elastic, then price effects of demand changes must be incorporated. These rich data are not readily available and information gives way to assumptions (see Harriss, 1987a, for a critique).

Using a SAM constructed for the North Arcot district in India, Hazell et al. (1991b) calculated, using 1982/1983 data, that 0.87 rupees additional value added would be stimulated by a 1.00 rupees increase in agricultural value added. This result is under the assumption of inelastic supplies of agricultural products so the additional value added is in the non-farm sector (see Bell et al., 1982, for a similar result in Malaysia). Assuming elastic supplies of agricultural products, the multiplier is an additional 1.18 rupees of (agricultural plus non-agricultural) income. Unfortunately, there is no distinction made between locally produced and locally retailed products so it is impossible to say how much of growth in non-farm value-added is commerce as opposed to manufacturing.

Haggblade et al. (1989) compared marginal consumption expenditures for rural households in Nigeria, Sierra Leone, Malaysia and India. Marginal consumption of locally produced non-foods is much larger in the Asian studies (about 35% versus 15%), although marginal expenditure on local products including food is about 80% in all countries. They note that African expenditure on non-food goods is likely to be biased down more than in Asia because of the higher proportion of non-traded goods and services. Using a very simple, three parameter SAM model, and 'representative' African data on consumption parameters from Sierra Leone and Nigeria, and production parameters from surveys in many countries, they calculate agricultural growth multipliers of the order of 1.5. This means that a $1 increase in value added in agriculture generates an additional 50 cents of rural income.

Lewis and Thorbecke (1992) presented a considerably more detailed SAM analysis for the village of Kutus (population about 5000) in Central Province, Kenya, and its surrounding region (total population, 46 000). They disaggregate production activities into: several types of agriculture, farm-based non-farm activities (such as basket-weaving, carpentry, tailoring), rural non-farm (coffee processing), town and other. Non-marketed production is included. Households

are classified according to location in a similar fashion with small- and large-land owning farmers, rural non-farm households, and low and high education town households. Many town households are involved in agriculture, and conversely, farm households on average obtain barely half of their income from farming with 19% of income coming from town businesses operated by farm families. The SAM is estimated using marginal expenditure patterns and assuming either infinite supply elasticities (fixed price multipliers) or infinite supplies of non-agricultural commodities and inelastic supplies of agricultural commodities (mixed multipliers) with excess demands met from imports from outside the region. Under either assumption, additional expenditure by large farm and high education town households generates the lowest impact in terms of regional income growth.[8] Additional production in agriculture provides the strongest income multiplier effects even for town households, with, e.g., a 1 KSh increase in coffee *output* generating 1.12–1.42 KSh in regional value-added. (In value-added terms these multipliers are even larger and are close to the 1.5 found by Hazell et al., 1991b.) Farm-based non-farm activities have stronger linkages than town-based manufacturing. High education town households benefit most from production increases in all sectors of the economy. In terms of hired labor employment, the service sector, followed by farm-based non-farm and manufacturing production, has the strongest employment generating impact (Table 4, columns 3 and 4).

Although our focus is on developing country economies, lessons can be drawn from analyses of the US rural economy. Kilkenny (1993), e.g., uses a detailed rural–urban interregional model to simulate the effects of withdrawing farm subsidies. She finds strong positive linkages between agricultural incomes and rural agro-industry and local services. However, her results suggest that other manufacturers would by hurt by a growing agricultural sector driving up wages.

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[8] De Janvry and Sadoulet (1993) observe that in Latin America, the highly concentrated land distribution may reduce the importance of consumption linkages. With a highly skewed distribution of land and income, a few landowners benefit from the bulk of the income effects of agricultural growth, and these landowners are often absentee and therefore do not demand locally produced goods.

Table 4
Value-added and hired labor multipliers for Kutus region, Kenya, 1988 (source: Lewis and Thorbecke, 1992)[a]

Production activity	Value-added		Hired labor	
	Fixed price multiplier	Mixed multiplier	Fixed price multiplier	Mixed multiplier
Livestock	1.46	1.24*	0.10	0.08*
Coffee	1.44	1.12*	0.11	0.08*
Foodcrops	1.43	1.10*	0.11	0.08*
Coffee processing	1.26	0.07	0.10	0.01
Farm-based non-farm	1.26	1.04	0.17	0.15
Services	1.07	0.90	0.19	0.18
Manufacturing	0.84	0.69	0.12	0.11
Transport	0.58	0.40	0.05	0.04

[a] The fixed price multiplier assumes perfect elasticity of supplies of all goods while the mixed multiplier assumes perfect inelasticity of supplies of agricultural products (identified by *). The multipliers give the amount that value-added or the wage bill would increase with a 1.00 KSh increase in the supply (*) or demand for a given commodity/service listed on the left.

There may be changes in linkages as development proceeds. If we assume that the consumption behavior of higher income or more urban households reflects the direction in which expenditure patterns will move as incomes rise then one can look at cross-sectional data to predict these changes. In a study in Malaysia, Hazell and Roell (1983) found that about 28% of marginal spending by the top four deciles was on imported non-foods while the bottom four deciles averaged 19%. In the Philippines, the elasticity of expenditure on local products (food and non-food) was found to fall rapidly with income, from 0.94 for households depending on rainfed upland farming with an average household income of 3405 pesos to 0.435 for non-agricultural households with an average income of 17 930 pesos (Ranis et al., 1990). Harriss (1987b) reports that in the rural town of Arni, south India, the relative importance of goods produced in metropolitan factories or wholesaled via big cities increased from an already high 57% of local commodity flows in 1973 to 75% by 1983. In the latter year, new urban products had appeared in the markets such as soft drinks, cosmetics and consumer plastics (Harriss and Harriss, 1984). For a similar finding in rural Bangladesh, see Hossain (1984). Although demand for local products increases as incomes rise, their relative importance appears to fall.

There is likely, too, to be a change in the nature of local linkages as development proceeds. For example, using town-size as a proxy, Hazell and Haggblade (1990) reports that services and cottage industry dominate non-farm activities in rural areas of India

with growth coming in commerce and services as one moves to rural towns, accompanied by a shift from cottage to factory manufacturing as town size increases. They also note that, considering only rural areas, the same change occurs as one moves from low to high productivity states. On the other hand, there are examples of the survival and even growth of traditional handcraft sectors when an export market is successfully developed (see Section 5).

Vogel (1994) presents a cross-country comparison of SAM production multipliers to consider dynamic changes as development occurs and incomes rise. The 27 countries included are grouped as low, middle and high income developing, NICs, and low and high income developed. Because of the need for consistency across countries and data deficiencies the SAMs are highly aggregated and reliant on strong assumptions. Just as an example, six of the countries did not have any rural household income or expenditure information so the missing data were simply estimated from figures for other countries. Furthermore, non-agriculture is not decomposed into rural and urban so one cannot trace the linkages between agriculture and rurally produced goods and services. Nevertheless, a few points are interesting. First, at very low levels of development the strongest linkage is through consumption. The backward production linkages via agricultural inputs become stronger with development as agriculture becomes more capital intensive. Finally, the forward linkages, via agricultural processing, are never very strong and decline as processing becomes less important in the overall

economy. The important point is that all of the multipliers presented here are estimated using data on a country's current state. When using them to predict the results of more than marginal changes, it must be realized that the multipliers themselves may change in the process.

The characterization of rural markets as isolated may be reasonable for goods that are costly to transport, such as furniture, and for services. However, even at low levels of development markets are often at least partially integrated regionally and nationally. Rural firms, e.g., typically do not depend only on local inputs. A shortage of imported production inputs is often cited in surveys of rural firms as an important constraint on growth. Harriss (1987b) finds that markets may be widely integrated even with regard to agro-processing, the forward production linkage. For north Arcot's major agro-industry, leather, she reports that less than 5% of hides originated in the region with the rest coming from urban slaughterhouses in south India or imported from the north. In the rural town of Arni, over half of the grain supplying agro-industry and 90% of non-grain inputs (particularly silk and cotton) was from outside the district (with 20% of grain inputs from outside the state). She concludes that with transport available and for goods with a high ratio of value-added to weight, the location of industry depends not on local demands or input supplies but on relative labor costs.

Many studies indicate that at least some part of rural expenditure goes to goods imported from outside the region. For example, a sample survey of Kutus Town, Kenya, found that, on average, 41% of total spending by farm families leaked out of Kutus Town and the surrounding region (Evans, 1992). Addressing the question of why agricultural investments in the Muda region of Malaysia have not stimulated much local industry, Hart (1989) notes the facilitating role of infrastructure in both changing demands and allowing cheap non-local supplies. She finds in a 1988 village survey that products from Thailand were readily available in local markets arriving via the North–South Highway. Rural electrification had also generated large demands for several non-local products, with 70% of households owning a television and 30% a refrigerator.

On the other hand, rural infrastructure is also crucial to the growth of the rural non-farm sector. Although improved infrastructure may have a detrimental impact on rural non-farm enterprise due to competition from outside products and shifts in tastes, poor infrastructure also imposes serious costs on rural firms. For example, due to electricity shortages in Wuxi Province of China, almost every TVE had installed diesel generators to meet its own needs — at a cost several times that of power transmitted through the electricity network (Wang, 1990). This is a widely observed problem for all firms (rural and urban) in developing countries. Surveys of large- and small-scale manufacturers in Nigeria and Indonesia found that 92 and 59%, respectively, had their own electricity generators operating at less than 50% capacity (World Bank, 1994). It is a problem which is particularly acute in rural areas and for smaller firms, raising costs and leaving them less able to compete with foreign or domestic imports.

In addition to lowering costs, good infrastructure in the form of transport links are essential if non-farm enterprises are to breakaway from dependence on local market demands and sell to the outside world (see Mead, 1984). An evaluation by USAID of six new rural roads in the Philippines found that the fall in the costs of transportation and broadening of the market led to a substantial increase in both agricultural and non-farm incomes between 1975 and 1978 when the roads were built. Further, there was an average net increase in the number of non-farm incomes between 1975 and 1978 when the roads were built, and an increase in the number of non-farm establishments in the region of the roads of 113% (Ranis et al., 1990). In a survey of rural firms in four counties of China, Byrd and Zhui (1990) notes that a large majority of the firms sold more than 60% of output outside their home province. Such sales include sales of final goods domestically or exports abroad.

In simulations for the US which allow for the variety of effects of lower transport costs, Kilkenny (1998) demonstrates that the overall impact of falling costs may not be monotonic, but rather U-shaped. At intermediate transport costs, urban goods can reach the rural areas and the benefits of concentration draw most manufacturing to urban areas. As transport costs fall further, and likewise rural wages, the latter begins to draw non-farm industries back to the rural areas.

Subcontracting is an indirect way for a rural labor force to tap into a wider market. A buyer agrees to purchase semi-finished or final goods from another firm

(or household), and then sells the goods on to consumers or to another producer. A common system in developing countries is for a local "agent" to contract with households to produce goods which he then sells to an urban firm which then packages the goods and distributes them domestically or for export. There are many different arrangements concerning which parties bear the costs (and risks) involved in the financing of costs during production, ensuring quality, and marketing. The urban-based or multinational firm has an advantage over households in terms of marketing, both from the point of view of knowing what larger markets will purchase and because they may have their own distribution network. It may have less costly access to technical information which can be passed on to suppliers. By buying in bulk or producing semi-finished goods themselves, such firms may obtain inputs at lower cost which can be dispersed to household workers. Local agents have an advantage over non-local firms in their ability to choose the best workers and to supervise work in progress. As a result, the local agent is often expected to ensure quality. Local agents working as independent subcontractors may also bear the financial burden of purchasing finished goods from the households and finding buyers. Subcontractors can supply inputs — knowledge of the wider market and technology, and finance — which are costly for rural households to obtain. Thus, particularly when expanding sales beyond the immediate vicinity, rural households may benefit from working under subcontract instead of trying to produce and sell final products independently.

The main advantage to firms gained from choosing a geographically dispersed mode of production via subcontracting is lower labor costs. By subcontracting, a firm can utilize labor hours where the opportunity cost of labor is close to zero — either by subcontracting in regions with unemployment or by supplying work which can be done by women at home or in the agricultural slack seasons (see above). At the same time, the firm can capture some of the benefits of an urban location. This strategy will only be cost effective in certain sectors, for instance where the (unskilled or traditionally skilled) labor component is high, where the capital requirements are minimal, and where transport costs are relatively low.

Subcontracting systems are not just limited to cottage workers in backward regions of poor countries. They can continue to be important as a country develops. Japan, for instance, stands out among developed countries in its continued heavy reliance on subcontracting relationships between small- and large-scale firms (representing perhaps a third of all employment). Hayami (1997) provides a number of case studies carried out in East Asia (with an additional contribution on India) documenting in detail the variety of sub-contracting arrangements which have been developed. Taiwan is often considered an example of the successful development of a geographically dispersed industrial structure, and subcontracting has been a notable feature of this development. The initial impetus in the development of rural industry in Taiwan came from agriculture and was stimulated by a fairly equitable distribution of rural income and investments in higher value crops. However, the newer rural industries operate on a subcontracting basis with export oriented urban firms, often using imported inputs, and are no longer dependent on the local market for growth. Many aspects of Taiwanese policy may have contributed to these developments. For example, a land reform policy was effectively implemented and farmers' organizations developed, with government support, which helped farmers to pool their savings, improve irrigation and obtain new technologies. Unlike most countries, Taiwan avoided the problem of urban bias in its provision of infrastructure with rural areas well connected to both electricity and transport networks. Rural industrial estates and export processing zones were also established at an early stage. All of these factors are likely to have contributed to an annual 11.5% growth in rural non-agricultural income over the period 1962–1980 (Ranis and Stewart, 1993).

5. Policy implications: lessons and experience

This section considers what, if any, role there might be for government intervention in the non-farm sector. Governmental efforts to support the development of small-scale enterprises and specifically rural enterprises have traditionally taken the form of project assistance which is directed at targeted groups. These efforts have a fairly long history. Financial support programs were launched in Mexico, Venezuela and Argentina in the 1950s, and in Brazil, Chile and Colombia in the 1960s. These were intended to

transform cottage enterprises into modern small-scale firms. In Africa programs to support small-scale firms via the creation of industrial estates and training were initiated soon after independence. The focus of these programs was often on assisting in the transfer of business from foreign owners to nationals (Uribe-Echevarria, 1992). Following independence, India followed a strategy of import substitution, investing heavily in large-scale heavy industry. At the same time, traditional small-scale industries were protected by reserving certain goods for production in small-scale firms and limiting the capacity of larger firms (see below). In all cases, however, it was the large-scale urban industrial sector which was expected to be the real engine of growth. In light of experience, there has been a move away from this view and new emphasis on more 'broad-based' growth, with the development of agriculture and the rural economy gaining importance. Interest in the non-farm sector is a part of this focus on rural development. Nevertheless, in most countries projects to support small-scale and rural enterprise continue to be undertaken in a general policy environment which is biased against them.

As noted in Section 2, there are a number of policies commonly followed in developing countries which alter the relative labor/capital rental rates such that large (urban) firms face a higher ratio than small (rural) firms. Some distort the relative costs of capital, such as subsidized credit and interest rate ceilings, and others distort the costs of labor, such as minimum wage legislation.[9]

Interest rate ceilings on specific types of loans are imposed in order to give an incentive to investment. However, interest rate ceilings also make it unprofitable to lend to borrowers who impose high transaction costs, e.g., those who can provide little information on credit worthiness and desire small-sized loans, and have little collateral (and thus represent greater risks). This lowers the potential funds available to small and start-up enterprises, forcing them to rely more heavily on the informal market at markedly higher interest rates. While in principle investment credit subsidies would encourage greater capital intensity of production overall, in practice not all credit is subsidized and similar biases result. Subsidies are mainly captured by larger firms (especially urban) and both subsidies and interest rate ceilings lower the cost of capital to large urban relative to small rural producers. Another indirect impact of government policies which lower interest rates has been emphasized by Adams (1988). Low lending rates make it unattractive for financial institutions to develop mechanisms to mobilize small-scale rural savings (again because of transactions costs) which would then be available for lending to entrepreneurs. Rural people do save — most start-up capital is from family resources — and the lack of low cost savings institutions makes the pooling of local resources more costly.

The common policy of maintaining an overvalued exchange rate with low or zero import duties on imported capital equipment often has a similar detrimental impact on the cost of equipment to small-scale producers because their production equipment may not be recognized as such in the tariff codes. For example, in Sierra Leone, sewing machines, a crucial piece of equipment for small tailoring firms, were classified as a luxury consumer good and taxed as such (Liedholm and Chuta, 1990). As a result of such policies, it was estimated in 1974 that the effective rate of protection, i.e., taking into account tariffs on both outputs and inputs, for large-scale clothing manufacturers was 430%, while for their small-scale counterparts the effective rate of protection was only 29% (Haggblade et al., 1986). Similar biases have been noted in the treatment of imported raw materials and intermediate inputs. In general, the need for import licenses hurts both smaller and rurally located firms.

Distortionary policies in the labor market include minimum wage legislation, mandated benefits and labor legislation. These policies are particularly prevalent in Latin American countries. Considering both distortions together, estimates of the percentage difference in the labor/capital rental rates between small and large firms as a result of government policies range from 43% higher (South Korea, 1973) to 243% higher (Sierra Leone, 1976) (Haggblade et al., 1986).

In light of the studies discussed in earlier sections describing how off-farm activities typically form only a subset of household's portfolio of activities

[9] The observation that wages are higher in larger firms and capital costs lower does not by itself imply the presence of distortions since there may be economic reasons for such differences. For example, urban labor may be paid more to ensure reliability or it may be more skilled. Capital costs may be lower because the level of risk is lower, and so on. That said, some policies are clearly distortionary.

(which usually will also include agriculture) and the numerous linkages between the non-farm sector and agriculture, it is apparent that agricultural policies can have a pronounced impact on rural non-farm activity. While cross-sectional studies suggest that some of the linkages may diminish over time, they may be critical in the initial development of the sector. Taiwan and China provide the classic examples. An important lesson is that while policies aimed at the rural non-farm sector should not be made without consideration of their impact on agriculture, nor should agricultural policies be made in isolation. In developing countries, where the policy stance is often implicitly or explicitly biased against agriculture, it is unlikely that the rural non-farm sector will remain unaffected.

Projects rather than policies have been the primary method of encouraging the development of rural enterprise. The primary difficulty of project assistance, however, is that small and geographically dispersed enterprises are exceedingly difficult to reach, particularly in a cost effective manner, and the number of small enterprises is vast — even the largest projects, such as the Grameen Bank in Bangladesh, are thought

to reach only a small fraction of potential beneficiaries. As stated by Liedholm and Mead (1987, p. 101) "...virtually all small enterprise surveys reveal that only a tiny fraction of the entrepreneurs have heard of the programs intended for them and even fewer have been aided by them".

Project assistance to small-scale and/or rurally located enterprises takes several forms in terms of targets and type of assistance. By far the most common is targeted credit programs. These may be operated through government-owned commercial or development banks, private commercial banks, or NGOs. The record with such projects is very mixed. Loans from government institutions or mandated lending by private banks tends to end up in the hands of the wealthiest segment of the targeted group for the reasons cited above under credit subsidies (e.g., transaction costs). Some projects are quite successful in keeping costs under control while others are plagued by both high transaction costs and high rates of default (see Table 5). The Grameen Bank, an oft-cited project funded by the International Fund for Agricultural Development (IFAD) which lends to poor women in Bangladesh for both agricultural, especially livestock,

Table 5
Costs of small enterprise credit projects (source: Liedholm and Mead, 1987)[a]

Organization	Country	Type	Average loan value	Adminstrative cost (% loan)	Arrears (% loans outstanding)
Credit only					
Krishi	Bangladesh	GO-CB	$126	4.0%	10.5%
Agrani	Bangladesh	GO-CB	101	5.2	4.3
BKK	Indonesia	G	44	5.3	6.0
Janata	Bangladesh	GO-CB	125	5.3	14.5
Rupali	Bangladesh	GO-CB	119	6.2	6.2
FDR/Peru	Peru	DB	5961	9.0	8.0
Banco de Pacifico	Ecuador	CB	1100	13.0	7.0
DB Mauritius	Mauritius	DB	830	13.0	N/A
Uttara	Bangladesh	GO-CB	122	25.6	12.1
Bank Money Shops	Philippines	CB	687	28.0	N/A
SEDCO	Jamaica	DB	280	275.0	N/A
Credit plus technical assistance					
DDF/Solidarity	Dominican Republic	NGO	1267	19.1	33.0
IDH	Honduras	NGO	1724	32.5	42.0
DDF/"Micro"	Dominican Republic	NGO	1680	44.0	42.0
UNO	Brazil	NGO	200	85.0	8.0
PfP/BF	Burkina Faso	NGO	670	185.0	23.0

[a] GO, Government owned; CB, Commercial bank; DB, Development bank; NGO, non-governmental organization. The information here is derived from studies done in the early 1980s so refers to that period.

and non-agricultural projects, has a default rate of less than 1% (Hulme, 1990).[10] The projects which are most successful are locally based, lend to groups, disperse small initial loans with additional lending conditional on repayment and charge something approaching realistic interest rates (see Morduch, 1999, for a review of experience with microfinance programs).

With few exceptions it has been found that industrial estates targeted at the development of small-scale and rural enterprises have not reached that group, often because the sites and services provided are too expensive. Uribe-Echevarria (1991) notes that between 1970 and 1980 rural industrial estates in India grew by 63% while those located in urban and peri-urban areas grew by more than 200%. A rationale often provided for establishing industrial estates in rural areas in the first place is that these will act as "growth poles" and stimulate local economic activity. However, Harriss (1987b) investigates the industrial estates in North Arcot district, India, and finds first that they are situated not in backward areas but in the more developed areas of the district and second that they have few local linkages. There are few agro-industries and their inputs are not local.

India has frequently used the tool of reserving production of specified goods to small-scale or traditional enterprises as a method of preserving certain sectors in the face of competition from modern factories. For example, in the 1950s India banned textile mills from expanding capacity, except for export, and later reserved synthetic cloth production for small-scale powerloom (less than six looms) and handloom production. The intention was to support the handloom producers, but since powerlooms were much more profitable, powerloom production grew four times as quickly from 1956 to 1981. Asking whether this unintended result of the reservation policy was beneficial, a rough social cost benefit analysis of powerloom versus mill production by Little et al. (1987) suggest it was not. Mill production was much more socially profitable than powerloom production at any plausible shadow wage rate. They note also that while the

reservation policy certainly increased employment in the textile industry directly, it is likely to have lowered it in the end by destroying the industry's export potential. Similar developments occurred in the sugar industry, where restrictions on mill production have encouraged an intermediate product, khandsari, rather than the traditional gur industry. The traditional industry was probably hurt by the policy and cost/benefit analyses suggest that khandsari production was less beneficial than mill production.

Many of the benefits of non-farm employment discussed in Section 3 have been found for employment generated by government-run public work schemes. These projects build infrastructure, primarily in rural areas, and are operated either on a continual basis to give employment to the poor, or in response to natural calamities such as harvest failures, to compensate for temporary income falls. The importance of infrastructure for the development of the private non-farm sector has been noted in Section 4. Ravallion (1991) reviews cost/benefit analyses of two large public works schemes: the Maharashtra Employment Guarantee Scheme (EGS), with an average monthly participation of half a million (1975–1989), and the Bangladesh Food for Work Programme, which was of comparable size in 1990. First, by drawing labor away from other activities, wages in other sectors increased. Simulations suggest that this indirect benefit of higher wages received by those not employed by the programs could be as high as the direct benefit to participants. The opportunity to engage in this non-farm activity stabilized incomes substantially. Income was found to be 50% less variable in villages with a public works program than similar villages without such a program. Finally, women were able to benefit and had participation rates as high as men's. Particular features of the employment schemes were conducive to this result, e.g., short travel distances and the provision of child care.[11]

Finally, the great heterogeneity of the non-farm sector in rural areas implies that there is little scope

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[10] Ravallion and Wodon (1997) note that the Grameen Bank outperforms other banks in Bangladesh in targeting those areas where poor farmers in particular are well placed to realize gains from switching out of agriculture into non-farm activities.

[11] Programs such as the EGS are sometimes criticized in India for failing to "reduce" poverty in a significant way. This perception would seem to follow from a somewhat narrow view that poverty is an either-or state, rather than one which exists in degrees. While the EGS has perhaps not sufficed to lift large numbers of the poor above the poverty line, its impact in reducing the degree of destitution (by bringing large numbers of poor households closer to the poverty threshold) is well documented.

for general, broad, policy prescriptions. This observation may well provide an important lesson for our thinking about the process of policy formulation. A wide variety of interventions may be required to promote the non-farm sector, each tailored to specific local conditions. Decentralized decision-making may be necessary: mechanisms should be devised whereby local information flows upwards so that the localized bottlenecks are relieved and specific niches can be exploited. While certain types of policies, relating to education and large-scale infrastructure, e.g., will remain important for promoting the non-farm sector and do not lend themselves naturally to highly decentralized implementation, there seems to be a clear rationale for also pursuing decentralized policy design and implementation wherever possible. The real challenge in this context will be to ensure that greater decentralization does not compromise distributional goals. The gains from decentralization are most likely to be felt in terms of more extensive, and productive, non-farm activities. It is less clear that decentralization can also be relied on to ensure that the poor benefit in particular from these increased activity levels. It is possible, e.g., that better endowed communities will be better placed to take advantage of decentralized funding and implementation mechanisms, or that within a given community the priorities of local elites are more effectively articulated than those of the poor. Monitoring of the distributional impact of the non-farm sector, and introduction of measures to enhance the beneficial impact, are thus likely to remain important duties for the central authorities.

Acknowledgements

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