Chapter 8
Household Income Diversification into Rural Nonfarm Activities

Thomas Reardon, Julio Berdegué, Christopher B. Barrett, and Kostas Stamoulis

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INTRODUCTION

The traditional vision of rural economies as purely agricultural is clearly obsolete. Farm households across the developing world earn an increasing share of their income from nonfarm sources (see Table 4.1). And the specialized nonfarm households that emerge often diversify into multiple business activities. Decisions affecting nonfarm enterprise creation, closure and growth are, thus, commonly taken within the confines of a multi-activity rural household. Thus, the nonfarm enterprise dynamics, discussed in Chapter 5, fit into a household decision-making environment that helps to shape labor and capital allocations across activities, as well as outcomes. Consequently, a fuller understanding of nonfarm enterprise dynamics requires an assessment of the household decision-making environment within which these decisions are frequently made.

Household motives for diversification, as well as the opportunities available to them, differ significantly across settings and income groups, suggesting an important distinction between: (1) diversification undertaken for accumulation objectives, driven mainly by "pull factors"; and (2) diversification undertaken to manage risk, cope with shock, or escape from agriculture in stagnation or in secular decline, hence driven by "push factors." These terms of push and pull factors are found in many household and regional case studies that have examined patterns of household income diversification in the developing world.[1] While diversification driven by pull factors is usually associated with an upward spiral of incomes and assets for the households thus engaged, the diversification by push factors sometimes extracts a household from poverty, but can be merely a holding pattern or one of immiseration (even "growth with immiseration" as Barrett 1998 puts it) as the household adds the equivalent of subsistence-level nonfarm activity to a risky and poor agricultural income base. It thus becomes important for policymakers to understand the nature and patterns of household income diversification, and distinguish the factors that drive households into nonfarm activity, and thus inform program and policies in the RNFE domain. A separate chapter in this volume, that by Lanjouw, explores then the outcomes in terms of poverty or poverty alleviation of household choices.

This chapter addresses the above issues by focusing on four key questions. First, how should one conceptualize a farm household's decision to diversify its income sources into rural nonfarm activities? Second, what is the empirical evidence concerning the extent and nature of that diversification? Third, what is the empirical evidence

[1] See Evans and Ngau (1991), Francis and Hoddinot (1993), Davies (1993), Webb and Von Braun (1994), Reardon (1994, 1997), Bryceson and Jamal (1997), Reardon et al. (1998), Ellis (2000), Barrett et al (2004), Ellis and Freeman (2004). .

concerning the determinants of that diversification? Fourth, what are the program and policy implications? To address these questions, this chapter reviews findings from several hundred rural household surveys in developing countries.[2]

CONCEPTUAL FRAMEWORK: WHY RURAL HOUSEHOLDS DIVERSIFY INTO RURAL NONFARM ACTIVITIES

The rural household or individual's decision to supply labor to the rural nonfarm sector can be conceptualized as a specific application of the class of behavioral models of factor supply in general, and labor in particular.[3] Economists model the labor supply as well as capital investment (for own-enterprise startup or upgrading) function (of say household i) to activity j is a function of incentives and capacity variables. The household is assumed to want to maximize earnings subject to constraints imposed by its limited resources and in trade-off with its desire to minimize risk. First we examine the determined choice, and then the determinants.

The "determined variables", the labor supply and capital investment decisions, for our present purposes is "diversification" into nonfarm activity. Then, the diversification choice can be decomposed into five interdependent and simultaneous choices.

(1) Nonfarm participation: choice of farm sector activity (as producer or wage-labor supplier) versus non-farm activity.
(2) level of non-farm activity,
(3) Sectoral choice within RNFE : manufacturing vs services
(4) location: whether to undertake it locally (RNFE) or elsewhere via migration.
(5) Form: whether to undertake self-employment or wage-employment (the functional choice)

On the other hand, the "determinants variables" of the above five choices are

(1) the set of incentive "levels" facing the household, including relative prices of outputs from and inputs to activity j versus activities k,

(2) instability of incentives: the set of incentive "variation" facing the household, including relative risks (climatic, market, and other risks) of activity j versus activities k, and

(3) the set of capacity variables (capital assets including human, social, financial, organizational, physical that enable the undertaking of activities), specific to j and to k and non-specific.

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[2] . The review draws from earlier reviews of mainly African and Latin American evidence (Reardon (1997), Reardon et al. (1998), Reardon et al. (2000), Reardon, Berdegue and Escobar (2001) and Barrett, Reardon and Webb (2001)), and updates those reviews and adds Asian evidence.

[3] See for example Sadoulet and de Janvry (1995) for the economic theory of general factor demand and supply models, and Rosensweig (1989) for labor market models.

Below we retake the categories of the conceptual framework, focusing first on empirical evidence concerning the choices that households in various regions make as revealed in patterns of diversification into rural nonfarm activity, and then focusing on the perspectives and findings of the literature on the determinants of diversification into nonfarm activity, guided by the conceptual categories of determinants noted above.

PATTERNS OF HOUSEHOLD DIVERSIFICATION INTO THE RURAL NONFARM ECONOMY

Participation in nonfarm activity

Contrary to the traditional image, diversification into rural nonfarm employment is extremely widespread and important. Table 8.1. reviews survey evidence concerning the shares of rural nonfarm income in total incomes. As these come from surveys across the developing world over various years, degrees of coverage, and differences in survey methods and definitions of variables, the results should be taken as broadly indicative. The table shows that on average, (local) rural nonfarm income constitutes roughly 40% of household incomes in all three regions. So as not to make the table unwieldy, we did not report many years per country, but suffice it to say that most of the studies reported showed from moderate to fast growth in the share of RNFI in total income over the past two decades. In China for instance, in 1981 only 15% of rural households worked off-farm, compared to 32% in 1995 (de Brauw et al). In Bangladesh, 42% of rural incomes came from RNFI in 1987, and by 2000, the share was 54% (Hossain, 2004). An earlier chapter in the volume explores further the general time trend of RNFE growth at more aggregate levels. Clearly, integrated farm-nonfarm households are a common sight across the developing world, and the trend is steep.

The average composition of incomes of course hides the distribution over households of RNFE. The range is generally around 30-50% of households undertaking both farming and RNF activities[4], but a number of studies are showing even higher participation, such as in Kenya where the share is 90% (Barrett et al., 2004). The engaging in multiple activities is termed “pluriactivity” in the literature, and can be contrasted with specialization. Comparisons of individual versus household pluriactivity have been rare in the literature, but the results for China, for example, by Knight and Song (2003) are probably indicative: 65% of households operate in both the farm and nonfarm sectors, while only one-third of individuals do; this relative specialization by individuals makes economic sense, and the diversification by households makes risk management sense.

One would expect the frequency of pluriactivity to be inversely related to the average income level of the zone.[5] In poor areas, where households typically operate both farm and nonfarm activities, they may not do either very efficiently but they are able to

[4] Berdegue et al (2001), Ruben and van den Berg (2001), Corral and Reardon (2001), Barrett et al. (2004), Smith et al. (2001), Deininger and Olinto (2001).
[5] Deininger and Olinto (2001), Reardon (1997), Reardon et al. (1999), Reardon, Berdegue and Escobar (2001), Barrett, Reardon and Webb (2001).

manage risk, compensate for a poor asset base and survive. In contrast, in richer zones the specialization rate is higher. More households specialize in purely farm or purely nonfarm pursuits. This makes sense in terms of the larger markets (aggregate demand) to support specialization in the richer zones, and less "risk management objective" by households diversifying. Given the efficiency gains from specialization, this positive correlation between income and specialization makes economic sense. Comparing individual households, however, the opposite relationship occurs. Increasing household income is typically associated with higher rates of pluriactivity.[6] However, closer inspection reveals that this more extensive diversification at the household level actually involves specialization among individuals. Richer households commonly have individual members who specialize in nonfarm work, often highly-paid wage employment or work as managers of specialized nonfarm trading, transport and processing businesses.

These zone and household strata patterns in terms of pluriactivity versus specialization are mirrored on average over countries and regions. African households in general typically exhibit higher rates of pluriactivity whereas in the wealthier Latin American countries household specialization is more common. In part, the sharp seasonality in rainfed African agriculture generates a long dry season during which most households need to undertake some form of remunerative activity. For this reason, the agricultural and nonfarm calendars are typically counter-cyclical (Chapter 3, Figure 3.1).

The above is of course presented as a static picture, but the reality is that households and communities follow paths of development which include alternative income-earning strategies. Examples of work examining these activity portfolio formation paths include Barrett et al. (2005) at the household level in Africa (Cote d'Ivoire, Rwanda, and Kenya) and Hansen et al. (2005) at the community level in Honduras. This work on "dynamics" is important for RNFE development program design to target household groups and communities.

RNF vs Farm Wage Labor Income

Contrary to conventional wisdom, RNFI typically far exceeds farm wage-labor incomes. In spite of a common tendency in the literature and in policy discussions about farmer income diversification to emphasize the importance of off-farm *agricultural* wage labor, available empirical evidence suggests that rural *nonfarm* income typically greatly exceeds the value of farm wage earnings. A series of several dozen household case studies indicates that rural nonfarm income exceeds agricultural wage earnings by a factor of 5:1 in Latin America and by 20:1 in Africa (Reardon, 1997; Reardon et al, 1998; and Reardon, Berdegue and Escobar, 2001), and in India, 4.5 :1 (Lanjouw and Shariff 2002) to name but a few examples of a general pattern.

Exceptions occur in two situations. The first is among the landless poor and in zones with substantial commercial farming such as the ranching areas of Argentina, the fruit zones of Chile and the sugar zones of Honduras. The second, but only in a relative

[6] Berdegue et al. (2001), Ruben and van den Berg (2001), Corral and Reardon (2001), Barrett et al. (2004) Smith et al. (2001).

sense, is true of the poorest stratum everywhere; for example, in India, while the ratio is 4.5 : 1 for the average household (nonfarm to agricultural wage income), that ratio for the poor is only 0.75 : 1 (Lanjouw and Shariff). . Farm wage labor has the lowest entry barriers, and the lowest returns, of all activities.

Local RNFY vs Migration

Available evidence contradicts the traditional assumption that earnings from labor migration exceed that of local nonfarm activities. Contrary to conventional wisdom, RNFY far exceeds migration incomes (recall that these can be earned in either the farm sector (a Oaxacan peasant working on a tomato farm in Northern Mexico) or nonfarm sector (a Honduran rural girl working in a maquiladora in a secondary town), simply that they are not earned locally).

In Latin America, even in areas of heavy outmigration, such as Mexico and Central America, local nonfarm earnings normally exceed those of migrant remittances. A study of ejidal households in Mexico, for example, finds that only 7% of incomes come from migration compared to 38% from local nonfarm earnings (de Janvry and Sadoulet, 2001). Five studies from Latin America suggest that local nonfarm earnings exceed those earned by migrant family members by a ratio of over 10 to 1 (Table 8.1). This belies the commonly held view in Latin America that migration income is much greater than local RNFE income. In fact, available evidence suggests quite the opposite. Corral and Reardon (2001) find that, even in Nicaragua, with its reputation for heavy reliance on remittances to rural families, only 10% of households have migrant members, and of those, 4 out of 5 work in domestic urban locations while only 1 migrates to international destinations.

Similarly in Africa, a set of over 25 case studies suggests that local nonfarm earnings exceeded the value of migrant income by roughly a factor of two (Table 8.1). In resource-poor rural zones, however, remittances become more important than in dynamic rural regions. Comparison of favorable and unfavorable rural zones in Burkina, Namibia and Niger suggest that the share of migrant earnings in total income roughly triple in importance in poor regions (Table 8.1). In areas of extreme rural poverty, such as the former South African homelands and the desert areas of Namibia and Botswana, migratory labor becomes very important, accounting for half of rural incomes (Table 8.1). These areas appear exceptional, however. Even in northern Burkina Faso during the serious drought of 1984, average migration remittances totaled only one-tenth the value of local nonfarm incomes (Reardon, Matlon and Delgado, 1988). The importance of migration does, however, vary significantly over time. In the Sahel after the 1984 drought, the share of migration income in total rural income was about three times higher than the average share over the first half of the 1980s (Reardon, Matlon and Delgado, 1988; Reardon, Delgado and Matlon, 1992). Though clearly important for some rural households, migrant earnings are highly variable (de Haan, 1999; de Haan and Rogaly, 2002). On average, they appear to be significantly less important than local rural nonfarm earnings.

Also in Asia, local nonfarm income is typically much more important than migration remittances except in the few countries where international migration has become extremely important (the Philippines) and rural-urban migration has grown extremely rapidly. For example, de Brauw et al. (2002) show that while a farmer working in the nonfarm sector in 1981 was three times as likely to work locally as to work as a migrant worker, by 2000 the ratio was one to one. However, Lohmar et al. (2001) show that most of this migration was actually rural-to-rural, reflecting the immensely fast rural industrialization in China, a relatively rare situation in developing countries.

It is also the case that, with notable exceptions some of the countries in transition, local sources of nonfarm income far exceed overall transfers to households (including private transfers such as remittances, and public transfers such as pensions). Winters et. al (2005) found that the share of income from transfers to overall household income ranged from 11% in Nepal to 0.3 percent in Ghana. However, the share of households having some income from transfers (participation) ranged from 54.7 in Panama to 23.7 in Equador. Those shares should be compared with a nonfarm income share .

RNFY Wage Income vs. Self Employment

Contrary to conventional wisdom, RNFY wage income is often more important than rural nonfarm self-employment earnings. Despite widespread self-employment, particularly among family-based, one and two-person enterprises, nonfarm wage employment appears at least as large a contributor to rural nonfarm income. Over regions, the importance of wage income (versus self-employment income) tends to be correlated with higher incomes and denser infrastructure. (The latter spatial perspective is explored further below in the section on determinants.).

In Latin America, nonfarm wage earnings (as a level, not a rate) commonly exceed the value of self-employment earnings. In Brazil, Chile, Colombia, Mexican ejidos and in Nicaragua, the share of nonfarm income from wage employment is on average much higher than that from self employment. In contrast, in Ecuador, Honduras and Peru, self-employment is more important than nonfarm wage employment, particularly in poorer zones . These differences can also be observed over different zones within a given country; for example, Berdegue et al. (2001) show in Chile that the wage employment share in RNFE is much higher in the more favorable zone compared to the less. Ruben and van den Berg (2001) and Isgut (2004) show that nonfarm wage income is much higher than self-employment income in the northern region of Honduras near towns that are linked in with better infrastructure and in higher density of rural towns, while in the southern zone infrastructure and town where density is lower, self-employment is much more important.

Out of seven African household studies which permit this comparison, four (Botswana, Kenya, Malawi, and Zimbabwe) show nonfarm wage income nearly twice as important as self-employment while the other three (in Rwanda, Ethiopia, and Sudan) suggest the reverse (Reardon, 1997). In all regions, the wage share of nonfarm earnings increases near towns while part-time self-employment looms largest in remote, rural areas.

In India, Lanjouw and Shariff (2002) found that RNF wage income was twice as important as self-employment income in a national sample, both for the average household as well as the poorest quartile. However, the average household earned only one-quarter of its nonfarm wage income from casual nonfarm labor, versus three-quarters for the poor quartile – indicating that the uneducated poor households relied on low skill, low entry barrier labor.

Services vs. manufacturing

Contrary to conventional wisdom (reflected in a long history of government and donor programs focused on rural manufactures rather than services), service sector income is often more important than rural manufacturing. In spite of common emphasis on rural industries, manufacturing typically accounts for a minority of rural nonfarm income, except in the most hinterland areas.[7] For example, in rural El Salvador, service sector jobs are twice as prevalent as small-scale manufacturing jobs. In poorer zones and among poorer households, however, labor-intensive household-based manufacturing may predominate, as with beer brewing in much of Africa, production of straw products in Andean zones and weaving in Northeast Thailand.[8]

Within any given sector, specific activities and technologies differ considerably according to household investment capacity, education and labor mobility. Since returns to rural nonfarm labor vary positively with investments per worker and since poor households have least to invest, self-employment among low-income households often affords the lowest returns within the rural nonfarm economy. Women, because of the severe restrictions on their mobility, frequently remain over-represented in low-paying, house-hold-based, labor-intensive activities (Table 8.2)..

DETERMINANTS OF HOUSEHOLD DIVERSIFICATION INTO RURAL NONFARM EMPLOYMENT

The categories of determinants discussed in the conceptual framework section inform our discussion in this section, first on incentives, then on capacity for rural households to diversify. Note that in both categories, one can further divide between meso-level variables that pertain to the zone or village level, and micro-level, pertaining to the household or individual level.

Incentives to Diversify

The "incentives" variables in the economic model presented above include: (1) the set of incentive "levels" facing the household, including relative prices of outputs from and inputs to the nonfarm activity versus farm activities (or among nonfarm activities), and (2) the set of relative risks of the activities. These two sets of "incentives"

[7] Reardon (1997), Reardon et al. (1998), Reardon, Berdegue and Escobar (2001), Barrett, Reardon and Webb (2001).
[8] Fisseha (1985), Lanjouw (1999), World Bank (1983).

variables in the above economic model have been the main focus of the determinants discussed in the development literature on diversification, with less emphasis on the capacity variables. To simplify the discussion in the literature, we can say that the livelihoods and other diversification analyses tend to distinguish "pull" and "push" factors as sets of incentives.

Pull Variables

The pull factors include higher payoffs or lower risk to rural nonfarm activity than those from farm activities (given risk preferences). Higher returns allow farm households to *inter alia* accumulate capital which, in turn, can be reinvested in farm technology upgrading and ratcheting up of farm incomes as well. There is some evidence of a Markovian process where farm or migration income is invested in nonfarm activity which in turn finances farm technology upgrading, cash cropping, education, and further rounds of nonfarm income diversification (see for example for the Philippines, by Estudillo and Otsuka (1999) for Mali, Dione (1989), and for China, Mohapatra et al. (2005).

Many studies at a national or regional level show returns to nonfarm activities well above returns to farming. The returns to nonfarm activity are highest nearest towns and in more favorable agricultural zones where effective demand is high, as follows.

High returns to local nonfarm activities tend to occur in regions where there is some growth motor such as agriculture, mining, or tourism. These create consumption- and production-linkages with the nonfarm sector and drive up demand for nonfarm goods and services. Chapter 7 explores these growth linkages in considerable detail. Here we summarize the points by noting that growing agricultural zones, for example, generate rising demand for nonfarm goods and services, provide raw materials to support processing and trade. Increased economic activity results in higher demand for labour and rising wage rates. All those factors contribute to stimulating the emergence of high-return rural nonfarm activities. The cotton zones of the southern Sahel, the green revolution in Punjab, the fruit-producing zone of Central Chile, and the coffee zones of southern Brazil have all witnessed eras of agriculture-led growth in their rural nonfarm economies (Reardon, 2000; Reardon, Berdegue and Escobar, 2001). Though returns to labor vary substantially across activities (Table 8.2), rising wage rates encourage a diversification out of the most labor-intensive, low-return nonfarm activities and into more remunerative nonfarm pursuits (Chapter 10, Table 10.1). One often sees a march of diversification first into self-employment manufactures (for example food processing and preparation), and then into wage-employment in manufactures, then self-employment in services **(such as petty commerce, bicycle repair, and so on)** and then wage employment in services such as transport, teaching, truck or farm equipment repair. As a result, at the start of a long growth process, one often sees manufacturing self employment dominant, and at the end, services wage employment dominant (as in Latin America case, Reardon et al. 2001). The mechanism of growth of the nonfarm share in areas with some initial motor (like farming or mining or tourism boom) may be more complex, however. It may involve a dynamic interactive process between the sectors and locations. For example, the

initial surplus from an agricultural "boom" may be invested in education and migration, which in turn is reinvested in upgrading of farming and investment in more capital intensive local nonfarm activities (such as shown in Estudillo and Otsuka (1999) for the Luzon, Philippines case).

Push variables

The push factors related to incentives are more complex. Households are "pushed into nonfarm activities by push factors which can be "idiosyncratic" (related to a single household or group of households) or "common" to all households in a zone or region, using Dercon's (2002) distinction. Moreover, as Alderman and Paxson (1994) note, there is a fundamental bifurcation of strategies to deal with risk and shocks in income. On the one hand, households pursue "risk management strategies" that involve choosing income diversification strategies that permit income smoothing over time, with the poor choosing to diversify incomes ex ante, into activities that have a low positive covariance with the returns to agriculture, and "income skewing", which is choice of activities with low risk (even if they have low returns). On the other hand, households pursue "risk coping strategies" that involve precautionary savings and asset management, involvement in informal and formal insurance arrangements, and diversifying income post facto (after a shock such as a drought). The above concepts aid us in analyzing the push factor incentives driving income diversification.

A first push factor is when the (seasonal) income from farming drops to levels not sufficient for survival in the off-season and households are pushed into nonfarm activities to smooth income and consumption inter-seasonally. This inter-seasonal smoothing of income is not necessarily coping with a shock, because the shock is not unexpected, but is rather regular, and thus is a long-term factor in the climate which farmers compensate with long-term ex ante off-season income diversification.

A second push factor is when there is a transitory (in a given year) drop in income from farming, say from a drought, which leads farmers to need to cope, ex post.

A third push factor is when there is a permanent (inter-year) drop in, or chronic insufficiency of, farming income, say from physical reasons (such as environmental degradation, chronic rainfall deficit, and disease[9]) or market/policy reasons[10]. Meso variables such as average landholding, land distribution, and population pressure clearly condition household diversification decisions. Over generations, as inherited landholdings fall below the minimum required to support a farm family, smallholders face little choice but diversification into nonfarm activity. For this reason, growing landlessness in South Asia has triggered strong interest in rural industries as a means of

[9] Since the early 1970's, in Brazil's central plains rapid farm mechanization displaced thousands of smallholder cotton producers, who subsequently sought refuge in rural nonfarm employment (Chase, 1997; Tacoli and Satterthwaite, 2003).

[10] Across much of Sub-Saharan Africa the post structural adjustment period witnessed rapid subsidy withdrawal from agriculture, input supply constraints and uneven private sector responses to the exit of marketing parastatals, all of which has placed smallholder farmers under pressure, leading many to seek supplementary earnings in nonfarm pursuits (Bah et al., 2003; Bryceson and Jamal, 1997).

absorbing new increments to the labor force in the presence of declining agricultural land availability.[11] Evidence from a series of Latin American case studies suggests that as household landholdings decline the nonfarm share in total household income rises (Reardon, Berdegue and Escobar, 2001).

This determinant is also important at the micro level. Household land holdings clearly affect their diversification decisions. The share of rural nonfarm earnings in total household income is usually highest for the smallest farm sizes in Latin America for example (Reardon, Berdegue and Escobar, 2001), or for Bangladesh (Hossain 2004). As agricultural land becomes scarce, households must seek compensating earnings in the nonfarm economy. For this reasons, landless households typically depend most heavily on nonfarm earnings (Table 8.4).

Note that the "relative return" assessment is not only between farming and local nonfarm activity, but also between migration and local nonfarm activity. Matshe and Young (2004) analyzed this choice in rural Zimbabwe and found that those able to migrate tend to not undertake local nonfarm activity due to relative returns.

A fourth push factor is where there is strong variation (risk) in farm incomes (say due to rainfall instability) driving households to engage in nonfarm activities with lower risk (even if they have low returns) or with the returns to which do not vary with farming outcomes. Degradation of fragile soils or rangeland, particularly in drought-prone regions, lead to irregular but sharp downturns in farm and livestock production. Well-documented responses to the severe, recurring droughts in the Sahel and the Horn of Africa epitomize this common response.[12]

The third and fourth push factors tend, regionally, to occur together. In areas with poor agro-climates and risky, less dynamic agriculture, nonfarm activity enables households to moderate risk and cope with periodic severe downturns in agricultural productivity (Box 8.1). However, in regions where agriculture is the driving force of rural economies, nonfarm income can be covariant with that from agriculture: in bad years opportunities for earning nonfarm income are reduced. As a result, nonfarm income in these regions tends to depend more on income from migration or from towns, income sources not subject to covariant risks with those of the local agricultural economy. The millet zone of the northern Sahel and rainfed areas of South Asia typically confront this situation. In these settings, local nonfarm activities with low entry costs and low capital requirements become highly congested and generate low returns (see Table 8.2). A study comparing slow and fast-growing agricultural regions of Thailand concludes, "If agricultural growth is weak, the result is not only a slowdown in the growth of high-value-added nonfarm activities but also a push for poorer farmers to seek employment in low-productivity nonfarm jobs." (Poapongsakorn, 1994). Comparisons of diversification strategies across agro-ecological regions find risk-induced diversification highest in riskier dryland areas. As a recent African study notes, "households are considerably

[11] Islam (1987b), Shand (1986b), Mukhopadhyay and Lim (1986).
[12] See Box 8.1, Reardon, Matlon and Delgado (1998), Reardon, Delgado and Matlon (1992) and Habtu, (1997).

more diversified in the higher risk, drier environment of agropastoral areas of Kenya than they are in the more humid, higher agricultural potential setting of Ivorien rice systems" (Barrett et al., 2004).

A fifth push factor is where there is idiosyncratic credit or insurance market failure, driving households to self-insure and self-fund input purchases. This is signaled in rural nonfarm studies[13] as well as migration remittance-use studies.[14] Weaknesses in rural factor markets likewise tend to encourage household diversification. Where credit and insurance markets are missing, rural nonfarm activity becomes a vehicle for self-insurance and for financing agricultural inputs and assets via nonfarm earnings. Weak land and labor markets may also encourage diversification. A skilled tradesman, for example a metal worker or mason, who inherits farmland but cannot rent it out or hire labor in the absence of well-functioning factor markets may diversify into farm production rather than specializing in his skilled trade full-time lest his landholdings yield him zero returns. That is, while we emphasize diversification into nonfarm activity, in some circumstances the diversification can be for the same motives but in the inverse direction. (Barrett, Reardon and Webb, 2001).

Capacity to Diversify into RNFE

Static and dynamic capital holdings

Recall that the "capacity variables" enabling households to undertake RNF activities, given the incentive levels, include capital assets such as human, social, financial, organizational, and physical capital. The capital can be public or private goods, and can be at the meso or regional level and thus generalized over an area of households, or "idiosyncratic" thus related to a household or a group of households.

There are two strands in the literature on which we can draw to conceptualize the role of capital as determinant of RNF activity.

On the one hand, the RNF income is based on activities each of which has a production function, with part of the arguments of that function being the capital assets. Note that RNF activities differ widely in the types and levels of capital they require. Teaching rural school requires education, repairing farm vehicles requires tools, long-distance commerce requires a truck, but being a porter in a rural market requires only the worker's back. Of course there is a strong correlation between the income from an activity and its capital requirement (Barrett, Reardon, and Webb 2001).

Based on that, one can think of each RNF activity as having a vector of capital requirements, K* (i.e., investments in various capital assets), that constitute the minima required by the production technology and transaction requirements to enter and sustain

[13] See, for example, Evans and Ngau (1991) Reardon, Crawford and Kelly (1994), Savadogo, Reardon and Pietola (1995), Hopkins and Reardon (1993), Loveridge (1992).

[14] Dione (1989), Francis and Hoddinot (1993), Collier (1990), Van Zyl et al. (1991), Hien (1991), Schultz (1996), Estudillo and Otsuka (1999).

the activity. These K* are functions of the technology, as well as the "target market" with its specific demands of volume, quality, and other transactional requirements. (See Reardon (2003), extending the "investment poverty" concept from Reardon and Vosti (1995), which in turn extended the "threshold investment" concept from David (1975).) Hence for example, rural producers of cheese for the town or city market will face very different requirements in terms of product quality, safety, and packaging, than for the rural market, and these requirements translate into minimum capital investments such as in cooling tanks for the milk, packaging machines, and so on, relative to more artisan-level cheese manufacture.

Research on the dynamics of RNF capital investment shows that investments can be inter-temporarily re-enforcing. The initial investment in nonfarm activity (via migration or local nonfarm) can set in train over time rural nonfarm activity differentiation over households; for example, Francis and Hoddinott (1993) show for Western Kenya that returning migrants to the cities bought land and made key investments in the higher capital-requiring RNF activities (e.g., construction) which in turn is translated into further investments in land and agriculture. A similar analysis was done in the cotton zones of Mali by Dione (1989) [15] . High initial stocks of human, financial and physical capital enable rich households to obtain skilled employment, purchase vehicles and equipment necessary for exploiting high-return opportunities in trade, processing and services. Skill-based and financial barriers to entry do not deter wealthy households, who systematically cream off the most lucrative opportunities in the rural nonfarm economy (Box 8.3). As a result, they earn returns many times greater than do poor households (Table 8.5). Conversely, asset-poor households remain confined to the low-return segment of the rural nonfarm economy.

Note that the diversification of household income into nonfarm sources can in turn, in a second round, alter agricultural assets, technology, and activity composition, thus influencing further rounds of income diversification as well as welfare. For a discussion of effects of nonfarm employment on agriculture, see Reardon (2000).[16] An interesting new strand of work is emerging on the effects of nonfarm employment back onto the land as an asset via effects on environmental practices, see for example Holden et al (2004) and Hansen et al. (2006); this will serve to condition (as incentive and capacity variable) in the ensuing rounds of decisions concerning livelihoods strategies including RNFE participation.

Meso level assets

The first capacity variable can be thought of a set of meso level assets, typically (but not always) public goods, classed as hard and soft infrastructure. Note that as with other capacity variables, there is a side to each that also involves incentives. For example, where infrastructure is good, transport costs are low, so effective output prices of

[15] Dione (1989), Francis and Hoddinot (1993), Collier (1990), Van Zyl et al. (1991), Hien (1991), Schultz (1996), Estudillo and Otsuka (1999).

[16] See also for example Evans and Ngau (1991) Reardon, Crawford and Kelly (1994), Savadogo, Reardon and Pietola (1995), Hopkins and Reardon (1993), Loveridge (1992).

nonfarm products are higher. This is however a two-edged sword as the road can make it cheaper to ship the raw product to a town or city for processing. There is a chapter in this volume devoted to the relation between infrastructure and nonfarm activity, so here we focus on the literature related to the household RNFE participation choice as a function of access to (meso level) infrastructure. Most of the descriptive studies (such as Anderson and Leiserson, 1982) and household econometric studies of RNF activity include several infrastructure variables. Nearly all the studies find that infrastructure is an important determinant of RNFE.

Proximity to towns and access to infrastructure such as roads, electricity and water are crucial capacity determinants of rural nonfarm employment and income levels; a number of Latin American studies showing this are reviewed in Reardon, Berdegue and Escobar (2001), African studies, in Barrett, Reardon, and Webb (2001), and South Asian studies (Hossain 2004 and Lanjouw and Shariff 2002). [17] Winters, Davis, and Corral (2002) employed factorial analysis and found these public goods crucial in households' RNFE participation choice in Mexico. Livelihood studies, likewise, document the important of links between rural and urban livelihoods (Kamete, 1998).

There have been relatively few studies that disaggregate RNF activities and analyze them in terms of spatiality using household data. Fafchamps and Shilpi (2003) present a fascinating (and useful for program design and targeting) mapping of self-employment RNFE versus wage-employment RNFE, versus farming and farm wage labor, at various distances from Nepalese cities, towns, and local markets. They show that RNF wage employment falls away quickly as one leaves peri-urban areas into the hinterland, but that there is a U-shaped pattern for self-employment, as some RNF activity in the hinterland serves local needs not met by supply from urban areas.

Sometimes such access compensates for lack of private assets such as education (although education and roads are themselves often correlated). In Thailand, for example, villagers living nearby the silk garment center of Pakton Chai are able to work as household contract weavers, earning wage rates eight times those of more remote rural households who are confined to working as rearers of silkworms and producers of cocoons and yarn (Chapter 16, Figure 16.2). Similarly, educated landless workers living in the densely populated rural zones of the Pacific region of Nicaragua, well served by roads and near major cities and ports, were top earners of rural nonfarm incomes in Nicaragua (Reardon, Berdegue and Escobar, 2001). In contrast, those in the hinterland were relegated to small-scale manufactures, local stagnant markets, and low returns to labor.

Analyses using gross measures of infrastructure can often be misleading, however, disguising intra-zone differences that in turn disguise significant pockets of deprived households who then must rely only on subsistence agriculture. Given general infrastructure access in a given region, different households can still face very different transaction costs in undertaking rural nonfarm activity. Households located in the

[17] Smith et al. (2001), Block and Webb (2001), Barrett, Reardon and Webb (2001), Cangarajah, Newman and Bhattamishra (2001).

hinterland areas of the central mountain area of Peru have significantly lower RNFI than to those well served by infrastructure near towns (Escobal 2005). They face different marketing costs for their products, different input costs, and have different catchment areas for their markets and thus face different effective demands.

Meso-micro level assets

The second set of capacity variables is at a meso-micro level, typically private goods. A good example of this is the set of organizational and social capital assets. These have been relatively under-explored in the rural nonfarm literature, but should be much more given that such social linkages can be critical to reducing transaction costs and risks for RNF activity. Some studies have addressed this link, such as Winters et al. (2002) for Mexico, and Zhang and Li (2003) for China, finding that social capital (such as membership in organizations and "connections") in general had important effects on RNF participation. Lanjouw and Shariff (2002) study the impact of caste on RNFE in India (schedule caste increases probability of nonfarm activity).

Micro level capacity

The third set of capacity variables are at the micro level, typically private goods. A good example of this is human capital in general, for which most studies show a strong effect on participation in and returns to RNFE.

A major thrust of this analysis is on the quality of human capital – hence the effect of education on RNFE (Evans and Ngau, 1991; Reardon, 2001;). A first example of this is education, a key source of human capital, which offers a potentially important route into higher-return nonfarm opportunities (see Box 8.4). Less-educated households rely instead on low-paying farm wage employment or very low-productivity nonfarm pursuits (Corral and Reardon, 2001 for Nicaragua, Lanjouw and Shariff 2002 for India, Hossain 2004 for Bangladesh). In contrast, the more-educated, particularly those living near roads and towns, earn higher nonfarm incomes in skilled activities such as teaching. Abdulai and Delgado (1999) confirm these findings, and also dis-aggregate by gender and show that the education-effect on nonfarm earnings and participation is even higher for women than for men in Ghana. A few studies, such as Taylor and Yunez-Naude (2000) for Mexico, disaggregate schooling effects on returns to nonfarm activities of different types, relative to cash and subsistence farming and farm-wage labor; they find that education's payoff is highest in rural nonfarm wage labor, but less so in cash cropping and RNF self-employment, indicating that there are significant differences inter-activity in skills. Some studies pay close attention to the gradations of schooling and relate those to wage- versus self- nonfarm employment, for example the study of Ecuador by Elbers and Lanjouw (2001): the least educated do low-paying nonfarm labor in manufactures or services, those with basic education manage small enterprises mainly in manufactures, and those with more education tend to work in the higher paying wage jobs like teaching or to have larger local enterprises.

On the other hand, many studies also focus on the simple availability of household labor, for example to allow some of the household to attend to farming and Z-good production and the rest to work off-farm (case of Burkina Faso, Reardon et al. 1992) in particular where farming is labor intensive such as in the rice areas of the Philippines (Estudillo and Otsuka 1999). Into this strand of literature fits work on gender time allocation and nonfarm activity. Moreover, there is a new strand of work, emerging from the New Economics of Labor Migration, focused on the effects of the household decision to send out migrants on household labor allocation to RNFE and farming (such as the work in China by Taylor, Rozelle, and de Brauw, 2003). They show that migration reduces labor allocation to farming but not to local self-employment, seen as a high return activity. This work then adds to the strand of work on migration remittance investment in nonfarm activity, such as the study in Western Kenya (Francis and Hoddinott, 1993) and the Luzon region of Philippines (by Estudillo and Otsuka, 1999).

A second example of a micro-level private good asset is household landholdings. We included those in our discuss of incentives as well as they are the example, par excellence, or a variable that potentially affects both incentives and capacity to undertake nonfarm activity. The incidence of landholdings on participation in and earnings from RNF activity is complex: (1) land can be collateral where credit markets function and thus increase access to credit, in turn used to invest in physical capital needed for more remunerative nonfarm work; (2) landholding (compared with landlessness) can be the key to enter organizations and groups and thus have social capital which aids in RNF activity; (3) land can simply be the determinant of farm investment, access to working capital and income, and most nonfarm activity investments are based on own-liquidity. In the studies that separate (in two-staged regressions) the decision to participate in RNFE versus earnings from RNFE, such as was done by Abdulai and Delgado (1999), one finds in the second stage that once one controls for assets such as education, the land effect is not significant. The findings in the literature regarding landholding effects on nonfarm activity are thus often mixed, as the farm household might be more able to undertake nonfarm activity (due to the above three factors) but have less incentive (as they have more farm income). This leads us directly to a key finding of this review regarding the "meso and micro paradoxes" of RNFE.

Meso- and Micro Paradoxes

Because of differences in initial asset endowments, rich and poor households diversify differently. The rich typically engage in more capital (including human capital) intensive and more remunerative activities, while leaving the poor confined to labor-intensive, highly contested niches with low barriers to entry and low returns. A series of African household diversification studies underlines this, noting that wealthier households often mention "profit-maximisation" as their motive for entering into rural nonfarm activities, whereas lower income households emphasize "risk minimization" and "income stabilization." (Bryceson and Jamal, 1997). A comparison of alternative livelihood strategies suggests that poor households are more likely to get caught in short-run recovery strategies (A), while rich households profit from diversification to initiate structural improvement strategies (D). According to one major review, "Diversification

can be described as a survival strategy for vulnerable households and individuals who are pushed out of their traditional occupations and who must resort to different activities to minimize risks and make ends meet. Conversely, wealthier groups with better education and skills can be pulled by new opportunities." (Tacoli, 2003). These results echo the findings on enterprise birth and death rates from Chapter 7. The rapid churning initiated by large numbers of new one-person startup enterprises typically emerges as a result of household survival strategies, by poor households pushed into low-return rural nonfarm activity for lack of better alternatives.

Thus, there arise two important paradoxes.

The first, a "meso paradox," arises in resource-poor areas where households have a high incentive but a low capacity to diversify – that is, they face a greater need to diversify into the rural nonfarm economy to compensate for their poor agricultural base (Reardon et al., 1998; Reardon, Berdegue and Escobar, 2001). Yet these poor regions have a lower capacity than well-endowed areas to generate rural nonfarm activity, especially of the non-refuge variety.

The second, or "micro paradox," emerges at the household level. Poorer households have a high incentive but a low capacity to diversify successfully, even if in some cases they rely more on nonfarm activity in percentage terms. The poorer households typically remain relegated to badly paying, low productivity, risky jobs in the rural nonfarm sector -- the equivalent of subsistence farming, offering no path out of poverty, just a means of bare survival. The poor face significantly higher incentives to earn rural nonfarm income, but they have lower capacity to succeed. In order to confront these two dilemmas, the empirical evidence reviewed here suggests two fundamental directions for policy intervention.

STRATEGIC AND POLICY IMPLICATIONS

Policy makers of the 21st century are attracted to the rural nonfarm economy because they hope diversification into rural nonfarm activity will offer poor households a route out of poverty. Before decision-makers can realize this dream, they will need to resolve both the micro and meso level paradoxes.

First and foremost, to counter the meso paradox it will be necessary to create a favorable environment for dynamic diversification of the rural economy. This will require dynamic engines of regional growth, a buoyant economic base, in agriculture, tourism or mining. Sparking these engines to life will generate opportunities in the rural nonfarm economy, for rich and poor alike, particularly when initial income increments are distributed broadly enough to yield wide spending increases on local goods and services. As regional wage rates rise, the composition of the rural nonfarm economy will change and returns to labor will increase enabling the poor as well as the rich to benefit from regional growth via nonfarm diversification.

For the long-run, resolution of the micro paradox will require increased investment in rural education and health. Ultimately, if the poor are to access the most

lucrative nonfarm jobs, they must upgrade their human and physical capital. The policy challenge is to equip poor households to move from "refuge" nonfarm jobs to more remunerative ones. For that, they need a variety of private assets such as education, health and capital and public assets such as roads, electricity, information and market institutions that enable them to access dynamic markets. Fortunately, resolution of the meso paradox contributes directly to solving the micro paradox, since poor households rapidly translate higher earnings into growing expenditure on health and education. For this reason, health and education services prove to be among the most buoyant segments of the rural nonfarm economy in prosperous rural regions.

Box 8.1 –Distress Diversification

The Darfur region of western Sudan has suffered from recurrent drought and fighting for most of the 20th century. Eleven famines have visited the region over the past ninety years, four of them since independence in the 1960's. In this primarily agrarian society, recurrent drought and environmental degradation have fueled steady decline in agricultural productivity and steady increase in annual food deficits. Case history interviews with 60 households in this region suggest a sequence of coping behavior in response to these pressures. In the aftermath of the 1983/84 drought, distress sales of livestock, coupled with drought-related deaths, reduced cattle holdings by 80% and camels, sheep and goats by 31% and 47% respectively. Many families likewise resorted to selling household furnishings, land and even trees. By 1990, 20 percent of the population had become landless.

As options in agriculture contracted, households turned to the nonfarm economy for survival. Some family members migrated to towns and even internationally, to Libya, in search of paid employment. Households living in proximity to small urban centers collected grass and wood to sell to petty traders in outlying assembly markets. Export of handicraft items such as styled leatherwork, pottery, metalwork, mats, baskets and carpets increased. As a coping strategy, many resorted to petty trade -- so many that markets rapidly became saturated. "There are too many sellers dealing in the same commodity – a classic case of perfect competition under free entry conditions." In this situation, rural nonfarm diversification represents not a route out of poverty but rather an attempt to cope with growing destitution. (Ibrahim, 1997)

Box 8.2 - Diverging regional patterns of household diversification

From the 1960's, steady growth in rice production, coupled with cassava and sugar export booms, boosted agricultural earnings in central Thailand. Meanwhile, the low-potential, rainfed Northeast remained far behind. These diverging trends in the agricultural base of each region resulted in widely different patterns of household income diversification. In the more agriculturally prosperous central region, rising labor demand in agriculture raised wage rates. Growing paddy, sugar and cassava surpluses led to the emergence of thousands of rice mills as well as sugar refineries, cassava brokers, producers of tapioca pellets, construction, metal workshops, agricultural equipment manufacturing, livestock feed and village retail shops. Meanwhile, in the sluggish Northeast, households also diversified, not because of expanding opportunities but rather because of the inability of agriculture to keep pace with growing population. In this resource-poor region, rural nonfarm diversification centered around labor-intensive export activities such as gemstone cutting, silk weaving, and production of artificial flowers, all for export. (Poapongsakorn, 1994).

Box 8.3 - Poor households diversify differently

Following a boom in rice production in the Muda River region of Malaysia during the 1970's, agricultural employment and wage rates rose sharply, by over 50% in real terms. This induced a subsequent phase of widespread agricultural mechanization. By the 1980's, virtually all farms in region harvested paddy by combine, either owned or rented. The resulting labor displacement in agriculture led local household members, particularly married men, to diversify into nonfarm activities. As a result, a study in one village in this region found the share of married men primarily engaged in nonfarm activities increased from 5% in 1977 to 30% in 1987.

Yet the character of that employment differed significantly between the poor and the rich. Members of poorer households, slightly under half of the nonfarm workers, found employment in low-wage nonfarm jobs such as construction labor, quarry work, lorry driving and rice mill labor. The remainder, from better-off households, found nonfarm work in more lucrative pursuits such as transport and trade enterprises, government jobs, and brokering and contracting services. On average, this better-off group earned incomes triple those of the low-wage group. Better education, larger land holdings (which enabled rental income or sales) and strong political contacts enabled this group to finance and access the more lucrative segments of the rural nonfarm economy. As in most places, the rich and the poor diversify differently, because of differential access to human, financial, physical and political capital. (Hart, 1994).

Box 8.4 - Education-led diversification

Madzu village in western Kenya enjoys fertile soils, a good climate and 1500 to 1800 mm rainfall per year. Remote location coupled with rudimentary infrastructure leaves the village isolated. Given a high population density of over 1,100 per km^2, land availability is low and the poverty rate surpasses 50%. In this unfavorable setting, two successful Madzu farmers found a route out of poverty via the rural nonfarm economy, both thanks to early investments in education. One farmer, a retired primary school teacher, managed to educate his eight sons on his teacher's salary at a time when school fees were low. With remittances they sent, the father purchased a dairy cow and 800 tea bushes. He now enjoys a steady income from milk sales and tea purchases by the Kenya Tea Development Agency.

A second village resident channeled savings from his civil service job into purchase of three dairy cows and fertilizer for his maize plot. Together with the manure from his cows, he achieves higher than average yield on his maize . In both cases, early investments in education led to a flow of nonfarm wage earnings which in turn financed investments in agriculture and resulted in a diversified and growing household asset and income trajectory over time (Marenya et al, 2003).

Country	Year	Nonfarm share of total income	Composition of nonfarm earnings (% of total income)		Ratio of local nonfarm to migratory	Source
			local	migration		
		a	b	c	b/c	
Africa						
Botswana	1974/5	54%	14%	40%	0.4	Valentine (1993)
Botswana	1985/6	77%	26%	51%	0.5	Valentine (1993)
Burkina Faso, unfavorable zones	1981-84	37%	34%	3%	11.0	Reardon et al (1992)
Burkina Faso, favorable zones	1981-84	40%	39%	1%	39.0	Reardon et al (1992)
Kenya, central	1974/5	42%	30%	12%	2.5	Collier and Lal (1986)
Kenya	1984	52%	38%	14%	2.7	Livingstone (1991)
Kenya, western	1993	80%	53%	27%	2.0	Francis and Hoddinott (1993)
Malawi	1990/1	34%	26%	9%	3.0	Peters (1992)
Mali, southern	1994-6	6%	5%	1%	5.0	Sundbert (1989)
Mozambique	1991	15%	14%	1%	25.0	Tschirley and Weber (1994)
Namibia, unfavorable zones	1992/3	93%	16%	78%	0.2	Keyler (1996)
Namibia, favorable zones	1992/3	56%	37%	19%	2.0	Keyler (1996)
Niger, unfavorable zones	1989/90	52%	33%	19%	1.7	Hopkins and Reardon (1993)
Niger, favorable zones	1989/90	43%	38%	5%	7.8	Hopkins and Reardon (1993)
Senegal, northern unfavorable	1988/9	60%	54%	6%	9.0	Kelly et al. (1993)
Senegal, central	1988/9	24%	20%	4%	5.0	Kelly et al. (1993)
Senegal, southern	1988/9	41%	39%	2%	19.0	Kelly et al. (1993)
South Africa, former homelands	1982-6	75%	25%	50%	0.5	Nattrass and Nattrass (1990)
Sudan	1988	38%	30%	8%	3.5	Teklu et al. (1991)
Tanzania	1969	32%	30%	2%	12.0	Ellis (1999)
Tanzania	1976/77	32%	30%	2%	14.0	Ellis (1999)
Tanzania	1980	24%	20%	4%	5.0	Ellis (1999)
Tanzania	1980	25%	21%	4%	5.0	Collier et al. (1990)
Tanzania	1983	38%	33%	5%	6.0	Ellis (1999)
Tanzania	1991	11%	10%	1%	10.0	Ellis (1999)
Zimbabwe, overall	1990/1	38%	26%	12%	2.2	World Bank (1996)
Zimbabwe, poor	1990/1	31%	17%	14%	1.3	World Bank (1996)
Africa average		43%	28%	15%	1.9	
average excluding Botswana, Namibia and South Africa		36%	29%	7%	4.1	
Latin America						
Brazil	1997	39%	37%	2%	20.0	Da Silva and Del Grossi (2001)
Colombia	1997	50%	48%	2%	20.0	Echeverri (1999)
Ecuador	1995	41%	39%	2%	20.0	Elbers and Lanjouw (2001)
Mexico	1997	43%	36%	7%	5.5	De Janvry and Sadoulet (2001)
Nicaragua	1998	42%	37%	5%	7.0	Corral and Reardon (2001)
Latin America average		43%	40%	3%	14.5	

Source: Compiled by Reardon (1997) and Reardon, Berdegue and Escobar (2001).

Table 8.1 – see end of paper (format)

Table 8.2 – Capital Intensity and Returns to Labor in Rural Nonfarm Activities, Bangladesh 1980

Industry	Capital per worker (Tk)	Value added per worker (Tk/day)	Share of female workers
Tailoring	4,982	27.5	20%
Dairy products	3,076	23.4	10%
Gur (sugar) making	711	20.0	0%
Carpentry	3,009	19.9	4%
Jewelry	1,283	18.7	2%
Blacksmithy	760	15.8	2%
Handloom weaving	1,594	15.1	38%
Oil pressing	1,006	12.6	43%
Pottery	799	11.8	47%
Paddy husking	303	7.4	56%
Bamboo products	313	5.2	49%
Mat Making	465	5.2	63%
Fishing nets	265	4.8	63%
Coir rope	145	4.1	64%

Source: Hossain (1984) cited in Lanjouw and Lanjouw (2001).

Table 8.3 – Household income diversification across settings

Household Diversification	Regional Economic Base		
	Sluggish or Deteriorating		Dynamic
	1. Resource poor (low-potential, ecologically fragile, drought-prone)	2. Unexploited potential	3. High potential, fast growing
Motivation for diversification	• seek refuge from eroding returns in agriculture • coping with past disasters • reduce future risks		• seek higher return opportunities in growing nonfarm markets • improve factor returns by deploying labor and capital in slack agricultural seasons • seasonal income and consumption smoothing • accumulate investment funds across enterprises to replace missing credit markets
Opportunities for diversification			
Asset-poor households	• labor outmigration • unskilled nonfarm employment • labor-intensive exports • z-goods		• local wage labor • labor-intensive services, commerce or manufacturingfor local markets
Asset-rich households	• skilled wage employment (government or private sector) • transport or commercial enterprises		• skilled wage employment (government or private sector) • skill- or capital-intensive rural nonfarm enterprises

Table 8.4 – Rural Nonfarm Income by Size of Landholding

Country land holdings (ha)	Nonfarm share employment	income	Country land holdings (ha)	Nonfarm income share
India, 1988			Northeast Brazil, 1996	
landless	0.46		landless	0.54
.01-.4	0.29		.01-.5	0.34
.41-1	0.19		.5-1	0.28
1.01-2	0.14		1-3	0.31
.201-4	0.12		3-5	0.03
.401 +	0.09		5 +	0.25
Korea, 1996			Nicaragua, 1998 (mz)	
0-.5		0.80	landless	0.74
.5-1		0.64	.01-2	0.37
1-1.5		0.49	2-5	0.31
1.5-2		0.42	5-20	0.27
2+		0.37	20-50	0.38
			50+	0.17
Thailand, 1981				
0-4.1		0.88	Northern Nigeria, 1992	
4.2-10.2		0.72	0-2	0.67
10.3-41		0.56	2-4	0.57
41+		0.45	4+	0.47

Source: Meagher and Mustapha (1997), Rosegrant and Hazell (2000), Corral and Reardon (2001), Ferreira and Lanjouw (2001).

Table 8.5 – Returns to Rural Nonfarm Activity, by Household Income Level

	Average nonfarm earnings (Ksh/worker)
Household income category	
Low	1,887
Medium	4,480
High	8,133

Source: Foeken (1997).

Added references

Abdulai, A. and C. Delgado. 1999. "Determinants of Nonfarm Earnings of Farm-Based Husbands and Wives in Northern Ghana," *American Journal of Agricultural Economics* , 81(1), February: 117-30.

Adams, R.H. 1998. "Remittances, Investment, and Rural Asset Accumulation in Pakistan," *Economic Development and Cultural Change*, 47(1), October: 467-491.

Alderman, H. and C. Paxson. 1994. "Do the Poor Insure? A Synthesis of the Literature on Risk and Consumption in Developing Countries," in D. Bacha (ed.) *Economics in a Changing World. Volume 4: Development, Trade, and the Environment*, London: MacMillan.

Anderson, D. and M.W. Leiserson. 1980. "Rural Nonfarm Employment in Developing Countries," *Economic Development and Cultural Change*, 28(2) January: 227-248.

Balihuta, A.M. and K. Sen. 2001. "Macroeconomic Policies and Rural Livelihood Diversification: An Uganda Case Study," LADDER Working Paper no 3. www.uea.ac.uk/dev/odg/ladder

Barrett, C.B. 2005. "Rural Poverty Dynamics: Development Policy Implications," *Agricultural Economics* (32) s1: 45-60

Barrett, C.B., M. Bezuneh, D. Clay, and T. Reardon. 2005. "Heterogeneous Constraints, Incentives, and Income Diversification Strategies in Rural Africa," *Quarterly Journal of International Agriculture* 44 (1): 37-60.

Berdegue, J.A., E. Ramirez, T. Reardon, and G. Escobar. 2001. "Rural Nonfarm Employment and Incomes in Chile," *World Development*, 29(3): 411-425.

Canagarajah, S., C. Newman, and R. Bhattamishra. 2001. "Non-farm Income, Gender, and Inequality: evidence from rural Ghana and Uganda," *Food Policy* 26: 405-420.

Dabalen, A., S. Paternostro, and G. Pierre. 2004. "The Returns to Participation in the Non-Farm Sector in Rural Rwanda," World Bank Policy Research Working Paper no 3462, December.

David, P. A. (1975). *Technical Choice, Innovation, and Economic Growth*. Cambridge University Press.

De Brauw, A., J. Huang, S. Rozelle, L. Zhang, Y. Zhang. 2002. "The Evolution of China's Rural Labor Markets During the Reform," *Journal of Comparative Economics*, 30: 329-353.

Deininger, K., S. Jin, B. Adenew, S. Gebre-Selassie, and M. Demeke. 2003. "Market and Nonmarket Transfers of Land in Ethiopia: Implications for Efficiency, Equity, and Nonfarm Development," World Bank Policy Research Working Paper no 2992, March.

Dercon, S. 2002. "Income Risk, Coping Strategies, and Safety Nets," *World Bank Research Observer* 17(2), Fall: 141-166.

Ellis, F. and H.A. Freeman. 2004. "Rural Livelihoods and Poverty Reduction Strategies in Four African Countries," *Journal of Development Studies* 40(4) April: 1-30.

Escobal, J. 2005. The *Role of Public Infrastructure in Market Development in Rural Peru*. Published doctoral dissertation, Development Economics Group. University of Wageningen.

Escobal, J. 2001. "The Determinants of Nonfarm Income Diversification in Rural Peru," *World Development* 29(3): 497-508.

Estudillo, J.P, A.R. Quisumbing, and K. Otsuka. 2001. "Income Distribution in Rice-growing Villages during the Post-Green Revolution Periods: The Philippine Case, 1985 and 1998," *Agricultural Economics* , 25: 71-84.

Francis, E. & Hoddinott, J. 1993. Migration and differentiation in western Kenya: a tale of two sub-locations. *Journal of Development Studies*, 30 (October) (1): 115-145.

Holden, S., B. Shiferaw, and J. Pender. 2004. "Non-farm income, household welfare, and sustainable land management in a less-favoured area in the Ethiopian highlands, *Food Policy* 29 (4) August: 369-392.

Hossain, M. 2004. Rural Non-Farm Economy in Bangladesh: A View from Household Surveys. Center for Policy Dialogue (CPD) Occasional Paper Series no 40, Dhaka: Center for Policy Dialogue.

Isgut, A.E. 2004. "Non-Farm Income and Employment in Rural Honduras: Assessing the Role of Locational Factors," *Journal of Development Studies* 40(3) February: 59-86.

Jansen, H.G.P, A. Rodriguez, A. Damon, J. Pender, J. Chenier, and R. Schipper. 2006. "Determinants of income-earning strategies and adoption of conservation practices in hillside communities in rural Honduras," *Agricultural Systems* 88: 92-110

Knight, J. and L. Song. 2003. "Chinese Peasant Choices: "Migration, Rural Industry, or Farming," Oxford Development Studies, 31(2): 123-147.

Kung, J.K.S. and Y-F. Lee. 2001. "So What if There is Income Inequality? The Distributional Consequences of Nonfarm Income in Rural China," *Economic Development and Cultural Change*, 50: 19-46.

Kurosaki, T. and H. Khan. 2006. "Human Capital, Productivity, and Stratification in Rural Pakistan," *Review of Development Economics*, 10 (February): 116-134.

Lanjouw, P. 2001. "Nonfarm Employment and Poverty in Rural El Salvador," *World Development*, 29(3): 529-547.

Lanjouw, P. and A. Shariff. 2002. Rural Nonfarm Employment in India: Access, Income, and Poverty Impact. Working Paper Series no 81. New Delhi: National Council of Applied Economic Research.

Leones, J.P. and S. Feldman. 1998. "Nonfarm Activity and Rural Household Income: Evidence from Philippine Microdata," *Economic Development and Cultural Change* 46(4): July: 789-806.

Lohmar, B., S. Rozelle, and C. Zhao. 2001. "The Rise of Rural-to-Rural Labor Markets in China," *Asian Geographer*, v.20 (1-2): 101-127.

Matshe, I. and T. Young. 2004. "Off-farm Labour Allocation Decisions in Small-Scale Rural Households in Zimbabwe," *Agricultural Economics* (30): 175-186.

Mohapatra, S., S. Rozelle, and J. Huang. 2005. Climbing the Development Ladder: Economic Development and the Evolution of Occupations in Rural China, UC Davis Working Paper.

Reardon, T. 2003. "Desafíos de la lucha contra la pobreza rural en la economía globalizada de América Latina: instituciones, mercados y proyectos," in Division Desarrollo Productivo y Empresarial, Unidad de Desarrollo Agricola, CEPAL. (eds.) La pobreza rural en América Latina: lecciones para una reorientación de la políticas. Series CEPAL - Seminarios y Conferencias, number 27, August. Proceedings of the International Conference 27/28 January 2000 in Valle Nevado, Chile, "Encuentro de altos directivos de la lucha contra la pobreza rural" organized by ECLAC, Rimisp, and FAO. Pages 79-101.

Reardon, T. 2000. "Interactions Between the Agricultural System and Non-agricultural Activities of Farm Households in Developing Countries," in J-P Colin and E.W. Crawford (eds.) Research on Agricultural Systems: Accomplishments, Perspectives, and Issues. Huntington, NY: Nova Science Publishers, Inc., 163-178.

Reardon, T. and S.A. Vosti. 1995. "Links between rural poverty and environment in developing countries: Asset categories and investment poverty," *World Development*, 23 (9), September: 1495-1506.

Rosensweig, M. 1989. “Labor Markets in Low-Income Countries,” in H. Chenery and T.N. Srinivasan (eds.) *Handbook of Development Economics, volume II,* Amsterdam: North Holland.

Ruben, R. and M. van den Berg. 2001. “Nonfarm Employment and Poverty Alleviation of Rural Farm Households in Honduras,” *World Development*, 29(3): 549-60.

Taylor, J.E., S. Rozelle, and A. de Brauw. 2003. “Migration and Incomes in Source Communities: A New Economics of Migration Perspective from China,” *Economic Development and Cultural Change,* 52(1), October 2003, 75-101.

Taylor, J.E. and A. Yunez-Naude. 2000. “The Returns from Schooling in a Diversified Rural Economy,” *American Journal of Agricultural Economics* 82 (May): 287-297.

Winters, P., B. Davis, and L. Corral. 2002. “Assets, Activities, and Income Generation in Rural Mexico: factoring in social and public capital,” *Agricultural Economics*, 27: 139-156.

Winters, P., G. Carletto, B. Davis, K. Stamoulis and A. Zezza (2005) *Rural Income-Generating Activities in Developing Countries: A Multi-Country Analysis.* Paper prepared for the conference on “Beyond Agriculture? : The Promise of the Rural Economy for Growth and Poverty Reduction”, January 16-18, 2006, organized by the Food and Agriculture Organization, Rome.

Zhang, X. & Li, G. 2003. "Does guanxi matter to nonfarm employment?," *Journal of Comparative Economics*, Elsevier, vol. 31(2), pages 315-331.

Table 8.1 -- Composition of Rural Nonfarm Income, Case Study Evidence

Country	Year	Nonfarm share of total income	Composition of nonfarm earnings (% of total income)		Ratio of local nonfarm to migratory	Source
			local	migration		
		a	b	C	b/c	
Africa						
Botswana	1974/5	54%	14%	40%	0.4	Valentine (1993)
Botswana	1985/6	77%	26%	51%	0.5	Valentine (1993)
Burkina Faso, unfavorable zones	1981-84	37%	34%	3%	11.0	Reardon et al (1992)
Burkina Faso, favorable zones	1981-84	40%	39%	1%	39.0	Reardon et al (1992)
Cote d'Ivoire	1993-95	6%	6%	na		Barrett, Bezuneh, Clay, Rea (2005)
Ethiopia	1999	20%	20%			Deininger et al. (2003)
Ghana	1992	31%	31%	0%	39.0	Winters et al. (2006)
Ghana	1998	42%	42%	0%	39.0	Winters et al. (2006)
Kenya	1994-96	25%		na		Barrett, Bezuneh, Clay, Rea (2005)
Kenya, central	1974/5	42%	30%	12%	2.5	Collier and Lal (1986)
Kenya	1984	52%	38%	14%	2.7	Livingstone (1991)
Kenya, western	1993	80%	53%	27%	2.0	Francis and Hoddinott (1993
Malawi	1990/1	34%	26%	9%	3.0	Peters (1992)
Malawi	2004	64%	59%	5%	3.0	Winters et al. (2005)
Mali, southern	1994-6	6%	5%	1%	5.0	Sundbert (1989)
Mozambique	1991	15%	14%	1%	25.0	Tschirley and Weber (1994)
Namibia, unfavorable zones	1992/3	93%	16%	78%	0.2	Keyler (1996)
Namibia, favorable zones	1992/3	56%	37%	19%	2.0	Keyler (1996)
Niger, unfavorable zones	1989/90	52%	33%	19%	1.7	Hopkins and Reardon (1993
Niger, favorable zones	1989/90	43%	38%	5%	7.8	Hopkins and Reardon (1993
Rwanda	1999-2001	20%	20%	-7%		Dabalen, Paternostro, and P (2004)
Rwanda	1991	15%		na		Barrett, Bezuneh, Clay, Rea (2005)
Senegal, northern unfavorable	1988/9	60%	54%	6%	9.0	Kelly et al. (1993)
Senegal, central	1988/9	24%	20%	4%	5.0	Kelly et al. (1993)
Senegal, southern	1988/9	41%	39%	2%	19.0	Kelly et al. (1993)
South Africa, former homelands	1982-6	75%	25%	50%	0.5	Nattrass and Nattrass (1990

	Sudan	1988	38%		30%	8%		3.5		Teklu et al. (1991)	
	Tanzania	1969	32%		30%	2%		12.0		Ellis (1999)	
	Tanzania	1976/77	32%		30%	2%		14.0		Ellis (1999)	
	Tanzania	1980	24%		20%	4%		5.0		Ellis (1999)	
	Tanzania	1980	25%		21%	4%		5.0		Collier et al. (1990)	
	Tanzania	1983	38%		33%	5%		6.0		Ellis (1999)	
	Tanzania	1991	11%		10%	1%		10.0		Ellis (1999)	
	Tanzania	2000	46%		46%	na				Ellis and Freeman (2004)	
	Uganda	1996	34%		25%	9%		3.0		Canarajah, Newman, and Bl (2001)	
	Uganda	1999/2000	54%			na		na		Balihuta and Sen (2001)	
	Zimbabwe, overall	1990/1	38%		26%	12%		2.2		World Bank (1996)	
	Zimbabwe, poor	1990/1	31%		17%	14%		1.3		World Bank (1996)	
	Africa average		40%		29%	13%		2.3			
	average excluding Botswana, Namibia and South Africa		51%		39%	7%		5.4			
Asia	Bangladesh	2002								World Bank (2002)	
	Bangladesh	2000	54%		54%	na				Hossain (2004)	
	China	1993	30%							Kung and Lee (2001)	
	India	1993/94	37%		35%	2%		17.0		Lanjouw and Shariff (2002)	
	Nepal	1996	39%		36%	2%		16.2		Winters et al. (2006)	
	Pakistan	1990-1991	54%		37%	17%		2.2		Adams (1998)	
	Pakistan	1999	67%		67%	na				Kurosaki and Khan (2006)	
	Philippines	1998	77%		61%	16%		3.8		Estudillo, Quisumbing, and (2001)	
	Philippines	1987-1989	47%		24%	23%		1.0		Leones and Feldman (1998)	
	Sri Lanka	1999-2000	71%		34%	6%		6.1		World Bank (2003)	
	Viet Nam	1998	40%		34%	5%		6.3		Winters et al. (2006)	
	Asia average		51%		40%	10%		7.1			
Latin Am	Brazil	1997	39%		37%	2%		20.0		Da Silva and Del Grossi (2001)	

erica											
	Chile	1996	41%		39%	2%		20.0		Berdegue et al. (2001)	
	Colombia	1997	50%		48%	2%		20.0		Echeverri (1999)	
	Ecuador	1994	35%		33%	2%		22.3		Winters et al. (2006)	
	Ecuador	1995	41%		39%	2%		20.0		Elbers and Lanjouw (2001)	
	El Salvador	2001	72%		55%	16%		3.4		Tannuri_pianto et al. (2004)	
	Guatemala	2000	51%		44%	7%		6.5		Winters et al. (2006)	
	Honduras	1998	31%		31%	na				Isgut (2004)	
	Mexico	1997	43%		36%	7%		5.5		De Janvry and Sadoulet (2001)	
	Mexico	2003	62%		36%	13%		2.8		Taylor et al. (2004)	
	Nicaragua	1998	42%		37%	5%		7.0		Corral and Reardon (2001)	
	Nicaragua	2001	30%		28%	2%		7.0		Winters et al. (2006)	
	Panama	1997	79%		70%	9%		7.0		Winters et al. (2006)	
	Peru	1997	44%							Escobal (2001)	
	Latin America average		47%		41%	6%		11.8			
Source: Compiled by Reardon (1997) and Reardon, Berdegue and Escobar (2001).						01) and authors for current chapter.					