

NON-FARM EMPLOYMENT AMONG FARM HOUSEHOLDS IN RWANDA

By

Kampayana Théobald

A THESIS

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

MASTER OF ARTS

Department of Sociology

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ABSTRACT

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This study examines the structure of non-farm employment in Rwanda. Special attention is given to the situational circumstances under which households look to such employment as a matter of necessity and/or as an alternative to traditional work roles. Additionally, this study explores the importance of non-farm employment opportunities vis-à-vis the inequalities in land and income distribution. Based on data from a recent survey of 1,019 farm households, major differences are observed in non-farm participation by farm size group, education level and other household and individual characteristics. Households that have managed to secure both land resources and the skills necessary to participate in the non-farm sector put themselves in an exceptional position vis-à-vis the generation of income and accumulation of wealth. At the other extreme, are the near-landless farm households with little formal education and no training for alternative employment. These households, underemployed on their own farms have begun to rely on the meager wages they earn as day laborers on the farms of their neighbors.

ACKNOWLEDGEMENTS

The conceptual underpinnings and empirical basis for this research have emerged from a great deal of collaborative effort. Without the constant guidance of my advisor, Dr. Dan Clay, who coordinated work on non-farm strategies in Rwanda, I would never have been able to explore this interesting topic. All my thanks go to Dan for his needed help and advice. I would like also to acknowledge the members of my thesis committee, Dr. Craig Harris and Dr. Harry Schwaltzweiler, for their suggestions and helpful advice without which important pieces of this thesis undoubtedly would have been overlooked.

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INTRODUCTION

Despite the importance of non-farm employment as a means for supplementing the meager incomes of farm households throughout the Third World, the subject has received little systematic attention from social scientists in Rwanda. This situation is particularly disturbing given the country's limited natural resources and rapidly growing population, a problem observed as early as 1949 when population density in Rwanda was estimated to be one of the highest in Africa, and much higher than was found in the neighboring countries of Tanzania, Uganda and Zaire (Maquet, 1961). Bloom et al. (1986) argue that for less developed countries facing the problem of overpopulation, the greatest challenge is "to generate sufficient jobs at reasonable wages to absorb their rapidly growing populations into productive employment." The dilemma, they suggest, is that population growth has an impeding effect on wages and employment.

In rural areas of Rwanda, where in some parts the population has reached 1000 persons per square kilometer (Habyalimana, 1990), it goes without saying that land has become a scarce resource. Not only is production weak, but the creation of jobs at reasonable wages is made doubly difficult by the urban bias of most industries. Consequently there is a significant income differential between rural and

urban areas. The increasing scarcity of land in the rural areas is likely to have a negative effect on the distribution of landholding in Rwanda, an effect that will widen the gap between large and small land holders.

The combined problems of overpopulation, slow agricultural growth and below-subsistence incomes earned by major segments of the farm population, have compelled many to seek employment in the non-farm sector. It is postulated by Clay, et al. (1989: p.1) that income from non-farm employment will help alleviate the hardships that ensue from Rwanda's rapid population growth and low production, and may reduce the income gap observed between rural and urban areas and among segments of the rural population itself.

Off-farm employment has long been recognized by farm populations as a mechanism for bridging the income gap created by stagnant farm production and ever-increasing population pressure... Beyond its contribution to the overall growth of rural incomes, expansion of the non-farm sector has the potential for alleviating income inequalities inherent in the agricultural sector, notably those associated with an unequal distribution of landholding.

In the same way, it is believed that off-farm labor helps to improve the status of the poor. This has certainly been the case in Asia but, as Hazel et al. (1987) caution, this conclusion cannot be imported wholesale to the countries of Africa. However, some activities, notably food preparation and others dominated by women, do tend to reduce differences in income. They further state that "even if the impact on relative inequality is uncertain or negative, in

terms of absolute poverty alleviation non-farm earnings cannot but help improve the economic status of the poor."

Based on data from a recent survey of 1,099 farm households, this study examines the structure of non-farm employment in Rwanda. Special attention is given to the situational circumstances under which households look to such employment as a matter of necessity and/or as an alternative to traditional work roles. In other words, to what extent are younger farmers pushed out of agriculture because of insufficient landholding or, by contrast, does the non-farm sector select out only those with the educational skills necessary to compete, regardless of their resource endowment. Additionally, this study explores the importance of non-farm employment opportunities vis-à-vis the inequalities in land and income distribution in Rwanda.

NON-FARM EMPLOYMENT: CONCEPTS AND LITERATURE

Research on the emergence of non-farm employment in the Third World has been the focus of attention of many social scientists in recent decades. Based on an analysis of data from International Labor Office (ILO), Carl Liedholm (1973) concludes that rural non-farm activities comprise a significant part of all rural employment. In Nigeria, for example, ILO data show that 41% of employed males were engaged in rural non-farm activities in 1970. In Uganda, estimates were in the range of 20%. Elsewhere Liedholm (1973) determined that the level of non-farm activity varies

directly with population size, and that such employment can be seen as a partial solution to the problem of growing population pressure. Though pervasive, the extent of non-farm activities is often difficult to assess accurately because they tend to be found in the informal sector and in small and micro enterprises. It is reported that in Africa most rural non-farm employment is generated by micro-enterprises and firms with fewer than 10 workers (Liedholm and Mead, 1987).

More recently, Liedholm and Mead (1987) have underscored the role of small-scale industry in generating employment. They observe that small-scale industry is a reaction to the failure of modern industrialization strategies to solve the problem of unemployment and poverty. By comparing six developing countries that cover a broad range of wealth and poverty as measured by per capita GDP in 1980 (Jamaica, Thailand, Honduras, Egypt, Sierra Leone, Bangladesh), they discovered that some of these countries, Bangladesh for example, had very low per capita GDP yet relatively high numbers of small enterprises. They also examined growth rates and found that some, like Sierra Leone and Jamaica, were actually experiencing negative growth. Although the general trend was an overall increase in manufacturing output during the 1970s, the authors found that "employment in large scale manufacturing firms did not keep pace in any of these countries" and was even declining.

Data from six other countries (Haiti, Zambia, Burkina

Faso, Botswana, Indonesia and Kenya) have been cited in support of their argument. Evidence drawn from an empirical study of 14 other countries showed that small scale industry, firms employing less than 10 persons, account for more than 50% of total industrial employment.

Because of the linkages between small scale enterprises and low per capita income, Liedholm and Mead (1979) conclude that such enterprises tend to emerge in lower income countries. The lower the income per capita, the higher the percentage of employment generated by small scale industries. Although providing small relative value added, small scale industries have a substantial effect on the economy. Small-scale industries are most often engaged in the production of "light" consumer goods, principally food and beverages, textiles and wearing apparel, and wood products. In a ten country survey the authors also found that such small-scale industries were primarily located in rural areas for most of the countries and were generating more employment than the more heavily industrialized urban firms. In a sample of 13 developing countries, it was found that 63% of the manufacturing employment was generated in rural areas. Because of the informal, less visible nature of these rural enterprises, some suspect that the percentage might be higher still (Liedholm and Mead 1979).

Other important questions deal with the source of capital used by small industries, their rates of growth, and employment levels. Looking first at sources of capital, it

is reported that most of the funds invested in small-scale industries originate from personal savings or from friends, thus showing the limited involvement of the Government and other formal credit institutions (Liedholm and Mead, 1987). Data from five countries (Bangladesh, Nigeria, Sierra Leone, Tanzania and Haiti) were examined in support of this argument. Concerning the growth rate, it was found to be generally quite low among small-scale industries in India, Ghana, Sierra Leone, Turkey and Columbia, although its overall contribution to employment is substantial. Steel (1977) reports for example that during the 1960's smaller firms did absorb 6 times as many new manufacturing workers as did the large scale industries. Hoselitz (1959) and Anderson (1982) identify three phases in the process of industrialization. Based on these three phases, Liedholm and Mead (1987) compared changes in the size of small-scale industry to changes in the level of industrialization. In phase I or the early stage, they found that household activities dominate; in phase II, small and medium scale activities emerge and some household activities are displaced; in phase III, large scale industry predominates.

Another consideration is the demand for goods produced by small-scale industries. Although small-scale industry helps to boost rural household incomes, some studies have argued that the demand for goods from small-scale industries in rural areas will decrease as household incomes increase, because such goods are often of inferior quality (Resnik and

Hymer, 1969). By contrast, others argue that increasing rural incomes will raise the demand for goods produced in rural areas (ILO Mission 1978, Mellor 1976, Chuta and Liedholm 1979). Empirical evidence from Nigeria, Malaysia (Hazel and Roell, 1983), Sierra Leone (Byrlee and King, 1978) and Bangladesh (Deb and Houssain, 1984) demonstrates a strong positive correlation between change in rural household income and changes in the demand for rural small-scale produced goods.

The role of the State in promoting small-scale industry has been examined by Liedholm and Mead (1979) who point out that the State governments have not been active buyers of small-scale industrial goods. There are many ways in which Governments can enhance or hinder the development of small-scale enterprises, but particularly through the regulation of raw material imports. These imports may be directly allocated by centralized agencies or state trading firms, which often disadvantage small producers. Such was the case in Egypt where small producers encountered a severe problem until the government established an agency for channelling imported inputs to small producers in cooperatives.

Another example of government intervention is the creation of tariff structures that discriminate against certain types of enterprise. It is reported that in Sierra Leone, for example, "textile machinery used by large garment manufacturers was imported at a zero tariff rate. Yet simple sewing machines, basic items of capital for small

tailors were subjected to a high duty on the argument that they were considered luxury consumer goods." (Chuta and Liedholm, 1985)

Governments also influence the market for goods produced by small-scale industries. In Korea, for example, government regulations all but eliminated the incentive for exporting and importing goods from small-enterprises. Frank et al. (1978) show that minimum export and import values were set such that small firms were not eligible for subsidies. They state that,

To maintain a privileged status, traders had to sustain annual exports exceeding \$20,000 per year for firms registered as exporters and \$100,000 for importers. Many small enterprises were unable to meet these volumes. In Taiwan on the other hand, where the policy stance has been less discriminating, small firms have played a much larger role in industrial development as well as in exporting. (Haggblade et al., 1986).

In short, governments can play an important role in developing the rural non-farm sector, notably through the regulation of imports and exports, tariff structures and the availability of credit. But from a supply side perspective the willingness of governments to favor small enterprise development will and should depend at least in part, on the relative efficiency of small enterprises when compared to the heavier industries of the formal economy.

Liedholm and Mead (1987) argue that governments should selectively channel economic resources to small-scale industries that are socially more efficient than larger

scale industries and affirm that this could be beneficial in creating output and employment.

In their review of literature they conclude that, in general, small-scale enterprises in developing economies are efficient in the use of resources. They add that because of their contributions to income and productive employment, it is appropriate that they be the target of policy and project-focused attention from Governments as well as from international donors. Despite this observation, it is also found that "in most countries of the Third World, the overall policy environment is skewed against small producers. This is primarily because policy is aimed at providing special benefits to larger manufacturing enterprises." (Liedholm and Mead, 1987).

It is also argued that there is a linkage between agricultural and rural industrial activities and that agriculture generates the largest share of rural income. Because of this, any policy aimed at increasing agricultural output has an indirect effect on the demand for products of rural small-scale enterprises. Increasing agriculture output will increase rural incomes and the demand for rural small-scale industrial goods and services. This is especially so for small farmers who make up the largest segment of the rural population in the developing world. Goods produced by the industrial sector are more likely to be found on larger, commercial farms in these areas.

Assistance to small-scale industries is crucial in many different areas: in the provision of credit, technical/production and assistance, management assistance, marketing assistance and common facilities, just to name a few. In the area of credit, we know that a shortage of working capital is a major constraint faced by small-scale industries in many countries including Sierra Leone (Chuta and Liedholm, 1985), Haiti (Haggblade et al., 1979), Bangladesh (Bids, 1981), Honduras (Stallman, 1983), Thailand (Narong Chai et al., 1983) and Jamaica (Fisseha and Davis, 1981). Despite awareness of the credit problem, it is argued that "financial institutions have been reluctant to expand their lending to small-scale firms."

Although each country is in some way unique and must be considered individually, there are commonalities which permit us to generalize in our claim that small and micro enterprises are essential to the development of Third World agricultural economies. This position is strongly supported by Harper et al. (1979) who assert that "the attempt to develop indigenous small enterprises is as legitimate and important as a function of economic development as other more traditional tasks which have received official attention for a longer period."

Similarly, because of the contribution of small-scale enterprises in employment and income improvement in developing countries, Liedholm and Mead (1987) conclude that Governments in developing countries must seek changes in the

general policy environment that broadly affects small private enterprises, and implement specific projects designed to provide direct assistance to individual firms.

Non-farm Employment in the Rwandan Context

Many of the observations made and conclusions drawn above are applicable to the Rwandan case. Ecological theory tells us that a more differentiated employment structure (i.e., specialization in the non-farm sector) constitutes one possible solution to the problem of population pressure on the land (Durkheim, 1933). Other alternatives include the intensification of agriculture (Boserup, 1965, 1981), territorial expansion or migration (McKenzie, 1933; Hawley, 1950) and reduction of human fertility (Bilsborrow, 1987). In Rwanda, public and private initiatives have been developed to increase agricultural production through intensification, to facilitate the movement of households to other regions (e.g., the paysannat resettlement program) and to bring down Rwanda's fertility rate through family planning, but relatively little has been done to stimulate growth in the rural non-farm sector.

It is conceptually useful to distinguish between non-farm employment which implies the sector of employment activities and off-farm employment which implies the location of activities, both of which, together, comprise the process of occupational specialization. These criteria

have been discussed in the Rwandan context by Mead (1989) and have been summarized as follows.

Sector of Activity	Location of Activity	
	On Farm	Off Farm
Farm	I Agriculture	II Agric. Labor
Non-farm	III Non-Farm Activ.	IV Off-Farm Activ.

Source: Mead (1989)

This table illustrates the intersection of these two criteria, and the four resulting categories of employment. Zone I contains agricultural activities performed on one's own farm. Agricultural activities performed away from the individual's own farm, typically as an agricultural laborer, can be found in zone II. Zone III represents activities performed on the farm but not directly related to agriculture; fabrication of pots and clothing are examples of such activities. Finally, zone IV categorizes work performed off the farm and not in the agricultural sector, including retail sales, carpentry, masonry and others in the building industry, to name just a few. The focus of attention from this point onward is on "non-farm employment" (either on farm or off farm, i.e. category III and IV) and on "agricultural labor" (category II), since together these activities constitute the principal employment alternatives to subsistence agriculture for Rwandan farm households. Subsequently, non-farm employment and agricultural labor will be used to mean both non and off-farm labor.

Structure of Employment

Agriculture forms the backbone of the Rwandan economy, as 93% of the population live and work in rural areas (Bureau de recensement, 1978). Yet because economic growth has a strong urban bias, Rwanda's rural areas have become the principal supplier of labor for urban areas. This rural exodus has gained great momentum in recent decades (Olson, 1990), creating a flow of migration that may never be absorbed by the urban economy. Rising urban unemployment, high crime rates, poor housing and sanitation, and the potential for civil unrest are but a few of the symptoms of this transformation as it has been experienced around the world. Historical evidence shows us how "push" factors, notably scarce and unequally distributed land resources, the lack of alternative employment opportunities, and a low standard of living, invariably contribute to rural depopulation and to urban saturation. Improving opportunities in the rural sector and eliminating the urban bias may be the best hope for many developing countries, including Rwanda, to confront rural poverty. Byerlee and Eicher (1972) assert that since about two-thirds of the population in most African countries live in rural areas, national policies to deal with the employment problem will depend to a large degree on the ability to develop appropriate strategies and policies for rural development.

A recent study found that more than 50% of employment in manufacturing was engaged in the brewing of traditional

beverages. Eighty percent of the remainder was engaged in un-registered activities such as brick and tile makers, tailors, basket makers, etc., and over 75% of this employment was in rural areas. As discussed above, insufficient landholdings have compelled farmers to split their time into farming and non-farming activities, hence some of these activities are performed on a part-time basis. In the Rwandan context, this notion has special meaning. Part-time and non-farm activities are often intertwined for those operating small farms (Barlett, 1986). Small land owners, generally the poorest in rural areas, are invariably the most likely of all to turn to the non-farm sector in an effort to supplement earnings from agriculture (Goldkind, 1961). Though less time is devoted to agriculture in this instance, earnings from non-farm sources may be used to improve agricultural production. Improvements in agriculture will in turn boost rural incomes. In this way, non-farm activities often go hand in hand with improvement in agricultural production. However, not all non-farm earnings are reinvested in the farm enterprise. More often they are used to meet basic consumption needs that have not been satisfied by earnings from the farm.

The net impact of such changes on the rural poor is conditioned by the specific form of employment opportunities available. In areas where agricultural labor is the principal employment alternative for those with insufficient landholdings, the emergence of groups based on landholdings

often occurs. Many, beginning with the classical theorists, have observed the bifurcation of the farm population into "landholders" and wage laborers (Marx, 1967). Those with holdings insufficient for their families' subsistence needs are pressured to seek gainful employment off the family farm. In turn, those possessing excess holdings can put this surplus labor to work for a set wage.

Where initially these two groups are unified, as peasant farmers concerned with producing for their own subsistence, resource scarcities force their separation. The farm manager is oriented toward production for a surplus and enters into a competitive market where this surplus is exchanged for a profit. The agricultural laborer also loses his identity as a peasant farmer and competes in a competitive market for the sale of his labor (Mendras, 1970). By converting surplus production into increased landholdings, and/or higher levels of technology, the two groups become further differentiated and, to the extent that their holdings and occupational roles are maintained across generations, this process of differentiation and specialization leads to the formation of two identifiable social groups.

Though differentiation in the agricultural sector tends to be closely tied to landholdings, differentiation in the rural non-farm sector can occur independent of the distribution of landholdings, and benefit even those whose on-farm production capabilities are limited. By creating

employment opportunities for the poor and near-landless segments of agrarian society, growth of the rural non-farm sector can effectively begin to alleviate some of the inequalities inherent in the agricultural sector.

In summary, though the growth of non-farm employment opportunities is vital to rural development effort in the Third World, the consequences of such growth for inequalities and in the distribution of incomes are potentially very strong. This paper examines patterns of rural non-farm employment in Rwanda and the extent to which such activities are linked to land and income inequality.

Non-farm Employment and Income Distribution

In almost all countries that engage in non-farm activities, the trend is such that those activities have a great impact on income distribution. The effect of non-farm employment on income inequalities is variable. In certain contexts non-farm earnings tend to favor wealthier households and hence widen income inequalities. In other cases, the poorer households tend to be the primary beneficiaries. Haggblade et al (1987) share with us examples of where non-farm earnings, despite their importance in raising overall levels of income, do not bring about greater equality. Studies in Nigeria, Lesotho, Tanzania, Zambia, Uganda and Zimbabwe have shown that non-farm income is linked with higher income groups, though all groups benefit in absolute terms. Other studies, notably those conducted in Zambia, Botswana and

Nigeria can be cited as examples where non-farm employment tends to benefit poor households more so than the wealthy. These cases tend to emphasize the importance of women's non-farm earnings in reducing inequalities. Although these seemingly contradictory studies do not permit us to draw any general conclusions about the role of non-farm employment in promoting the status of poorer households, they do provide a formidable challenge to those interested in exploring this relationship.

HISTORICAL AND SOCIO-CULTURAL CONTEXT

Located in the highlands of East Africa, Rwanda is a country of mountains, hills and great lakes. This landlocked country shares its northern border with Uganda, while former sister-state Burundi is located immediately to the south, and Tanzania to the east. Rwanda is also flanked by Lake Kivu and a volcanic mountain range which occupies much of its border with Zaire to the north and west (Figure 1).

The history of land settlement in Rwanda has been passed down through the generations by oral tradition. Sifting through twentieth century literature reporting the works of the chroniclers on the "Sacred Kingdom," one learns of the settlement patterns of the various ethnic groups that make up the country's population today. The first group to occupy the territory now known as Rwanda were the "Twa." The Twa had little interest in agriculture and derived

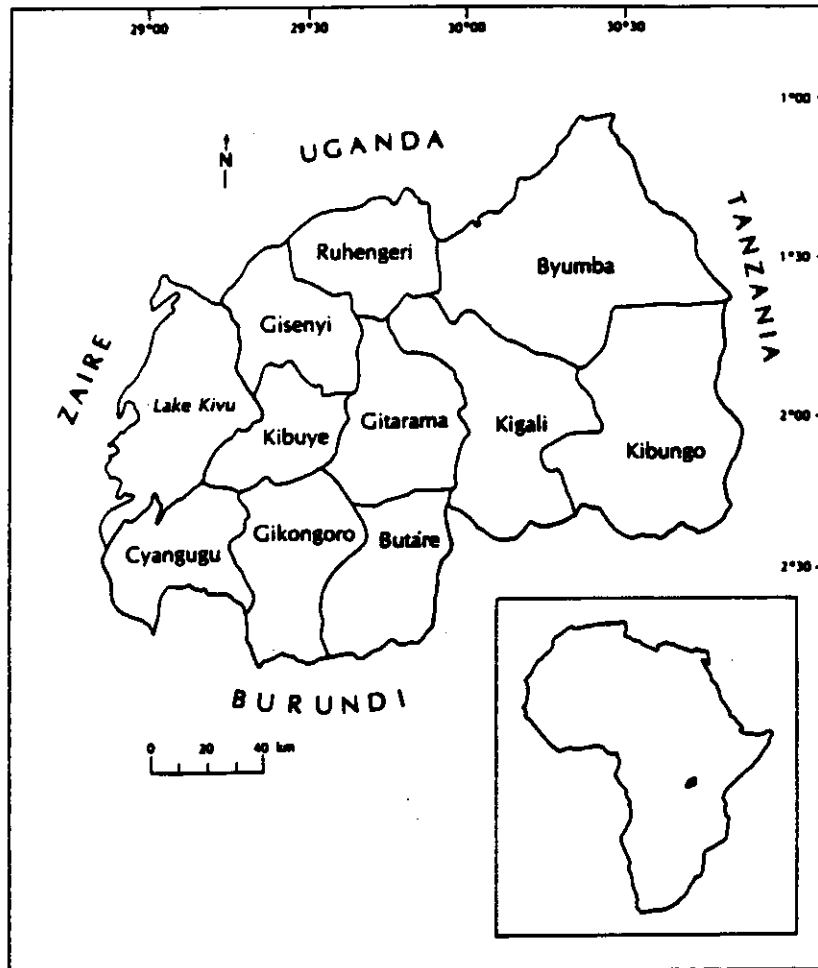


Figure 1. Map of Rwanda (source: Olson, 1990)

sustenance through hunting and gathering activities. The exact moment of their arrival is uncertain due to the incompleteness of historical records. The Twa were later joined by the "Hutu," agriculturalists who are believed to have originated from the west as part of the Bantu migration. A third ethnic group, the "Tutsi," is reported to have made their way to the highland areas in the 14th

century (Kagame, 1972). Arriving with herds of cattle, the Tutsi adapted slowly and peacefully to local conditions and, claiming to have come from divine origin, eventually wrested rights to the land from the Hutu majority, and ruled under a feudal system called "ubuhake" (to submit to the will of others).

Through the ubuhake system as reported by written history, the Hutu obtained the use of cattle owned by the Tutsi rulers and also received protection from this "would be elite group." In return, the Hutu were obliged to work for the Tutsi, to surrender a part of their harvest and to serve in the king's army as rank and file soldiers (Nyrop et al, 1985). This system was maintained through the centuries, and prevailed even during periods of German colonization and Belgian "mandate and tutela" colonial rule. In 1959, however, the internal social revolution that led to independence in 1962 successfully dismantled the traditional feudal structure and created a more equitable system of independent peasant landholders.

The total population of Rwanda was estimated at 3,073,000 million in 1967 (Rwanda, Ministry of International Cooperation and Plan, 1967) and the average density of this population was more than 163 persons per square kilometer. Current figures show that due to rapid population growth, the size of Rwanda's population is now in excess of seven million persons. At an annual rate of growth of 3.7 %,

Rwanda's population is expected to double in less than 20 years (Population Reference Bureau, 1989).

Hilly and sloping from west to east, the average altitude is approximately 1,600 meters with the mountainous western provinces having the highest altitude. The central and eastern provinces are lower in altitude, yet still hilly topographically. The capital city, Kigali, is located in the central eastern part of the country. There are four seasons, each with its corresponding agricultural activities. Two rainy seasons (September-December and February-May) are associated with agricultural seasons, and two dry seasons match the time of harvest and the clearing of the land for the next season.

The economy is based on agriculture, mostly subsistence agriculture. Beyond meeting the subsistence needs of their own households, most small farmers also produce cash crops, notably coffee and tea. Subsistence and cash crops compete on the small holdings (averaging 1.21 ha) and almost every household is involved in both types of production.

The use of modern technology in subsistence crop production was unknown until almost two decades ago. Today, one aspect of that technology, the use of organic fertilizers, is the most common among all the farmers who rely on it for increasing soil fertility. These fertilizers are produced locally at the individual household level.

Virtually all agricultural tasks are accomplished with the aid of simple hand implements. Hoes are used to till

and weed the soil, and machetes to clear the land and harvest certain crops such as sorghum and bananas. Neither animal traction nor motorized equipment are used.

Among the most important crops are bananas and sorghum which are grown primarily for use in the production of beer. Even the most casual social gatherings are marked by a sharing of conversation and the consumption of home-brewed beer, either banana or sorghum or both. Other important crops are beans, maize, potatoes, sweet potatoes, cassava, peas, peanuts, rice, and fresh vegetables.

Population pressure and declining soil fertility have prompted farm households to use marginal lands to produce rice and cassava. Rice and potatoes are the sole crops produced using modern technologies and there is no major food processing industry in Rwanda, though some small-scale commercial processing of dairy products such as milk, cheese and yogurt has developed in recent years to serve the urban market (Rwamasirabo, 1990). In the same way, but oriented more toward rural areas, a maize processing plant for flour production has been put into operation.

The traditional division of labor is based on gender and age and reflects the historical domination of women by men. Women split their time between agricultural and home based activities. In the field women take on the major responsibility for sowing, weeding, harvesting and processing crops after harvest. Cooking, cleaning and child care define life for women in the home. Young children are

expected to help their mothers both in the fields and at home, particularly with cooking, collecting firewood, fetching water, etc. Older children follow in the footsteps of their parents according to gender. Girls prepare themselves for motherhood and boys for fatherhood. Men are responsible for clearing land and share in its tilling, but their involvement in the fields beyond that point is limited to the maintenance and harvesting of coffee, bananas and other cash crops.

DATA AND METHOD

Data analyzed in this paper were obtained through a nationwide random sample of 1,019¹ farm households in Rwanda as part of the 1988 Non-farm Strategies Survey. Survey questionnaires were administered over a three-month period beginning in July, 1988, to various members of sampled households, including husbands, wives and adult children. An experienced team of Rwanda's Agricultural Statistics Division (DSA) field staff supervisors was engaged to carry out the interviews.

¹An unusual yet important feature of this study is that the households selected for study are actually a sample of households that DSA has been studying since 1986 as a part of its ongoing survey program. Consequently, the great volume of information already collected on these households, in areas such as farm size and fragmentation, crop and livestock production, and market transactions, can be drawn upon to enhance our analyses of non-farm strategies. Since 1986, a small number of households in the initial sample have moved away or have been otherwise dropped from DSA's current sample. The total number of households on which data are available at all points in time is 1019; these are the households for which data are presented in the following section.

The questionnaires were designed to obtain information from various members of the households, including husbands, wives and adult children. Topics addressed in the questionnaires included: demographic characteristics of all household members and migrant children; non-farm and off-farm employment; permanent and temporary migration patterns of selected household members; fertility/family size behaviors, plans and preferences of all adult household members; economic support networks between the household and members of the extended family living elsewhere; sources of household income; physical characteristics of the farm and residence; hired farm labor; and the plans, aspirations and opinions of parents and adult children regarding non-farm training and employment and the future for young people in farming.

In all, interviews averaged approximately one and a half hours to administer and usually required multiple visits to meet up with the various respondents from each household. Adult children were the most difficult of all to locate, though through multiple call-backs the interviewers did succeed in interviewing a large number of these young people.

FINDINGS AND DISCUSSION

Patterns of Non-farm Employment

Approximately half (47%) of farm households in Rwanda engage in some form of non-farm employment, and since our

survey reference period includes only the three months preceding the date of the interview, it is very likely that this figure underestimates the true proportion. When the members of farm households do seek non-farm employment, it is most commonly as agricultural wage laborers (31%) on the farms of their neighbors (Table 1). The remaining 69% of their time off-farm is spent in the rural non-farm sector, notably as artisans, laborers or in commerce -- generally in small businesses. Over five percent of non-farm employment is held by government functionaries.

Table 1. Percentage of Days Worked in the Non-farm Sector or in Agricultural Labor

<u>Type of Employment</u>	<u>% of Days</u>
Agriculture labor	30,8
Artisanal	18,9
Non-farm unskilled lab.	12,8
Commerce	16,4
Functionaires	5,6
Other salaried	12,3
All others	3,1
 Total	 100,0
(N=)	(464)

Those engaged in agricultural wage labor are most often hired to clear and till the soil or to weed and otherwise maintain fields of crops. Only 6.3% of all hired agricultural labor is used at the time of harvest. The three most important crops for which labor is hired are beans, sorghum and sweet potatoes (DSA, 1987). Time spent off the farm in artisanal activities is heaviest in the construction industry. Brick and tile makers, masons and

carpenters account for over half of all artisanal employment. Basket weaving, tailoring and art/embroidery, all industries in which women are heavily involved, comprise another 37% of the artisanal subsector.

The number of days per year that households are employed off the farm in various types of activities is presented by farm size category in Table 2. The estimated average number of days of non-farm work by Rwandan households is 78, or slightly under a third of a person-year.² As described above, agricultural wage labor, artisanal trades and commerce constitute the largest portion of this time. Households in the smallest farm size category appear to be the most likely of all to seek employment off the farm. This finding is consistent with our initial hypothesis that households experiencing the greatest resource constraints (insufficient landholdings) would be more actively engaged in non-farm employment.

The only farms to depart from this otherwise very supportive pattern of findings are those in the largest farm size category (2.0 Ha and above), which work off the farm a relatively high 77 days per year. An investigation into why these households might be employed in non-farm activities more than expected, found the explanation to be that these large farms tend also to support relatively large households, and the more adult workers there are in a

² Estimate based on 250 work days per year.

household the higher the chance that one or more of these workers will be "freed up" for non farm work (Clay et al., 1989). By controlling for the number of adult workers in the household we find that non-farm employment among these households drops into the expected range.

Table 2. Days of Non-farm Work by Type of Employment and Farm Size

Farm Size (ha)	N	Type of Employment							Total
		Agri- cult.	Arti- sanal	Unskld Labor	Comm- erce	Funct.	Other sal.	Other	
<0.5	253	31.2	16.8	10.4	10.8	4.0	20.4	3.2	96.8
0.5 - 1.0	325	30.8	14.8	9.6	8.8	0.4	7.6	3.6	76.0
1.0 - 2.0	261	15.6	14.4	10.0	16.4	1.6	5.6	0.2	63.6
2.0 +	180	12.8	14.0	10.0	16.4	17.2	4.8	1.2	76.8
Total	1,019	24.0	14.8	10.0	12.8	4.4	9.6	2.4	78.0
Sign.		.003	.093	.996	.325	.001	.056	.317	.050

The type of non-farm employment households engage in is also connected to the size of their holdings. Households with small landholdings tend to work off their farms as agricultural wage laborers, while those with larger holdings are more likely to hold jobs as functionaries and in commerce, though differences in the latter are not statistically significant. Employment in the artisanal trades seems to bear little connection to farm size. In summarizing the pattern of findings reported in Table 2, one can conclude, at least tentatively, that those from large farms tend to occupy those jobs that require higher levels of schooling and working capital, while those from households with small holdings make up the bulk of the agricultural wage labor pool.

Non-farm Employment and Characteristics of Individuals

To learn more about how and why certain households look to non-farm employment in an effort to generate income, we examine some of the characteristics of the individuals who comprise these households and who engage in non-farm employment. When households do seek such employment, 77.5% of the time they are represented by only one person. Less frequently, a second household member (15.9%), or even three or more (6.6%) can be so employed.

Table 3 reports that heads of households work in non-farm sector far more often than do other household members, as they account for over 55% of all non-farm employment in Rwanda. Adult children still living in the household are next at 34.3%, followed by spouses at 7%. Consistent with these results is the finding that nearly 80% of all non-farm employment is held by men. Because traditional Rwandan society places a heavy burden on women to labor both in the fields and in the home, few women are encouraged to seek specialized vocational training. The areas where women make the largest contribution off their own farms are as agricultural wage laborers, basket weavers and seamstresses -- all jobs that have great flexibility as to either when or where they are performed, thereby permitting coordination between farm and non-farm responsibilities.

Age also appears to be an important determinant of non-farm employment. Roughly 60% of this labor market is controlled by workers in their 20s and 30s. Those in the

Table 3. Percent of Non-farm Employment and Mean Days Worked per Year by Characteristics of Individuals (Population = all individuals who work in non-farm sector).

<u>Selected Characteristics</u>	<u>% of Non-farm Employment</u>	<u>Mean Days Worked Per Year</u>	<u>Distribution of Population Age 10+ Years</u>
<i>Relation to head of household:</i>			
Head	55.7	134	20.0
Spouse	7.0	78	14.8
Child	34.3	124	60.6
Other	3.0	66	4.6
Total	100.0%	124	100.0%
<i>Sex:</i>			
Male	79.3	140	47.0
Female	20.7	85	53.0
Total	100.0%	124	100.0%
<i>Age:</i>			
10 - 19	13.5	111	29.9
20 - 29	31.2	140	25.2
30 - 39	30.3	118	22.1
40+	25.0	120	22.8
Total	100.0%	124	100.0%
<i>Education level:</i>			
None	35.6	106	41.8
Some primary	33.2	111	40.8
Primary +	31.2	177	17.4
Total	100.0%	124	100.0%
(N=)	(667)	(667)	(5,084)

20-29 age bracket invest a greater share of their time in non-farm jobs than any other group, averaging 140 days per year. There are several good reasons for why this age group

stands out in its provision of non-farm labor. The first is that these young people are still experimenting a great deal with alternative career strategies and, because they have fewer dependents (or may still be living on their parents' farms), stability of employment is less crucial. Second, parents of these young people are in their 40s and 50s and are not yet ready to pass on more than fragments of their land holdings to their children. Third, many of these young farmers are aware that they will never inherit enough land to meet the subsistence needs of their families and believe they must make a niche for themselves elsewhere. Fourth, the level of schooling and specialized vocational skills obtained by this group exceeds that of their elders, allowing them to compete for those jobs in the non-farm sector requiring higher levels of training.

Table 3 highlights the importance of educational attainment to securing non-farm employment, as nearly a third of all such employment is held by the 17.4% of individuals who have managed to complete primary school. Those who comprise this "elite" group perform non-farm work an average of 177 days out of an estimated annual 250 work days, or 71% of their time. By comparison, individuals with no formal schooling at all work in non farm sector only 42% of the time. Globally, those who work in non-farm work do so 124 days per year on average, or "half time."

Multivariate analysis of Agricultural Wage Labor and Non-farm Employment

In previous sections we examined some of the bivariate relationships between characteristics of households and individuals on the one hand, and non-farm employment on the other. We now turn to a multivariate regression analysis that will enable us to assess the relative importance of some of these variables in explaining variations in non-farm employment and the sale and purchase of agricultural wage labor.

Table 4 presents findings from three independent multiple regressions. The first two columns report the simple correlation coefficient (*Pearson's r*) and the standardized regression coefficients (*beta*), between the number of days households worked in non-farm activities and seven household characteristics (predictor variables). The simple correlation coefficients indicate the degree of association between two given variables, without controlling for the effects of other explanatory variables, while the *beta* coefficients represent the correlation between two variables once all other identified explanatory variables are held constant (i.e., the true independent effect).

The strongest predictor of household participation in the rural non-farm sector is the number of adult male workers in the household ($\text{beta}=.26$). A large number of workers can easily exceed the labor requirement of the farm. Rather than under-employing these hands within the household, they are encouraged to seek alternative

Table 4. Multiple Regression Analysis of Days of Non-farm Activities by Household Members in the Non-agricultural Sector and in the Agricultural Sector, and Days of Wage Labor Hired by Households.

Explanatory variables	Days non-ag employment		Days ag labor worked		Days ag labor hired	
	beta	(r)	beta	(r)	beta	(r)
Days non-ag employment	--	--	-.12*	-.07*	.17*	.19*
Days Ag labor worked	-.12*	-.07*	--	--	-.02	-.07
Days ag wage labor hired	.17*	.19*	-.02	-.07	--	--
Farm size	-.11*	.04	-.15*	-.10*	.19*	.20*
Male workers in hshld	.26*	.25*	.21*	.15*	-.07	.03
Female workers in hshld	.03	.07	.05	.06	-.01	.03
Educ of head of hshld	.12*	.17*	-.01	-.02	.16*	.19*
Age of Head of hshld	-.01	-.05	-.06	-.08*	.05	.03
Multiple R	.35		.25		.32	

* Significant = <.01

employment opportunities in non farm activities. By contrast, an increased number of female workers does not translate into increased non-farm employment. This finding reflects the fact that women generally lack the training necessary for non-farm employment and, concomitantly, because they are assigned so many other household responsibilities such as caring for young children and preparing meals, their absence from the household tends to disrupt established patterns of daily life (and male domination) far more than does the absence of male workers.

Education of the head of household similarly has a positive effect on household employment. As suggested earlier, this is largely a reflection of the fact that non-farm employment so often requires higher levels of formal

schooling. This is true for the independent trades and small businesses, as well as for those who are salaried by local enterprises or the government.

The zero-order correlation between farm size and non-farm employment ($r=.04$) is slightly positive in direction but not statistically significant. This initial finding contradicts our theoretical argument that households with the smallest landholdings are forced to resort to employment in the non-farm sector. However, once we control for other variables in the model, the hypothesized negative correlation between farm size and non-farm employment emerges ($\beta=-.11$). In other words, because large farms tend to have many adult workers and their heads of households tend to have achieved relatively high levels of schooling, two characteristics that have also been shown to lead to non-farm employment, the correlation between farm size and non-farm employment is "forced" in a positive direction. However, once the effects of these other variables are held constant, the true influence of farm size on non-farm employment becomes visible.

We now turn to the set of household characteristics that induce members of households to seek outside employment as agricultural wage laborers. In Table 4 we note, first of all, that households whose members seek employment as farm laborers are not, generally speaking, the same households as those whose members find employment in the non-farm sector ($\beta=-.12$). Despite the tendency to work in either one or

the other sector, these two groups of households have two things in common -- they both tend to have relatively small landholdings and a large number of adult male workers. Again, this finding supports the notion that non-farm employment serves as an important strategy for households suffering from an over supply of labor relative to landholdings.

The third set of regression coefficients in Table 4 pertain to the amount of farm labor that households hire in. It is no surprise to find that, unlike households that engage in large amounts of non-farm labor, households that hire in labor tend to operate larger farms ($\beta = .19$) and to have relatively few adult male members ($\beta = -.07$), though this latter relationship is not statistically significant.

Perhaps most revealing of all is the finding that households that hire the most agricultural labor also tend to work in the non-farm sector ($\beta = .17$), notably in commerce, in various trades, and as functionaries. The higher education levels attained by these farmers permits them to participate in the higher end of the non-farm employment market, and pay minimum wage rates to those who work their holdings.

Focus on High Income Households

To further explore the notion that farm size, education level, non-farm employment and the employment of agricultural wage laborers are four variables that tend to

mutually reinforce one another in the process of income generation, and implicitly, of income inequality, we have isolated the 51 (5%) highest income households in our sample. These households generate an average income of 253,000 Frw per year, approximately 3.6 times the average for all households outside of this high income group.

As expected, we find that many of the heads of these 51 households have achieved relatively high levels of formal schooling. More than a third have completed primary school, and many of these have gone on to even higher levels. Due in large measure to the high educational attainment these farmers, and other members of their households, their participation in the non-farm sector is exceptionally high. Over two-thirds of these households generate non-farm income from one source or another, and of these, 77% are employed as functionaries or small businessmen (the upper echelons of the non-farm sector).

Though these high-income households are heavily engaged in the non-farm sector, they also operate (manage) some of the largest farms in our broader study sample. A full third of these households operate holdings of 3 hectares or more, and the average for this group of 51 households is 2.6 hectares. Generally speaking, these should not be considered subsistence-oriented farms. Rather, they are market-oriented and make heavy use of hired farm labor. Of the 51 farms, 37 (73%) employ labor from outside of the

household, and four of these employ the equivalent of three or more full-time workers.

This brief analysis of high-income households serves to highlight the combined importance of education and landholdings as the basis for income generation in Rwanda. By applying these human and land resources to an increasingly differentiated occupational structure, these households can draw from both the high end of the non-farm sector and from a growing pool of agricultural wage labor, to further expand their income generating capabilities.

Non-farm Labor and Inequality

The polarization of farms in Rwanda in terms of their ability to generate income can be seen in Table 5 which shows the proportion of farms in various income categories and the proportion of total income (column 3) they generate. While the households in the highest income class comprise only 15% of the population, they command nearly 35% of the country's total rural income. This concentration of wealth is represented in a Gini coefficient of .34, which is comparable to many other African countries.

For purposes of the present analysis, however, our interest is more to assess the extent to which non-farm employment helps reduce income inequality. Where column 3 of Table 5 presents the distribution of total household income in Rwanda, columns 4 and 5 break out this total into sub-categories -- "agricultural" and "non-agricultural"

Table 5. Percent of Households, Total Income, On-farm and Non-farm by Income Group

Income group (in FRW)	% of Households	% of Total Income	% of Agric. Income	% of Non-agri. Income
Less than 33,000	15.2	4.5	4.9	1.3
33,001 - 50,000	18.6	9.5	10.4	3.9
50,001 - 70,000	19.5	14.7	15.0	12.6
70,001 - 90,000	15.6	15.4	15.6	13.8
90,001 - 125,000	15.9	21.0	21.3	19.1
125,000 and above	15.2	34.9	32.8	49.2
Total	100.0%	100.0%	100.0%	100.0%
(Gini coeff=)		(.34)	(.31)	(.50)

income. Agricultural income is the value of all crop production, livestock and beer sales (banana and sorghum), as well as wages earned in the agricultural sector (agricultural wage labor). As described earlier, non-farm income is exclusively that earned from employment in the non-farm sector.

The Gini coefficients reported in Table 5, indicate that non-agricultural income is more concentrated in the hands of high income households (Gini=.50) than is agricultural income (Gini=.31). Where the wealthiest 15% of households control 33% of income derived from farm production and wage labor, they control nearly 50% of non-farm income. Not only do these findings seem to contradict our initial expectations that non-farm income would help equilibrate inequalities in the agricultural sector, but they suggest that income received from non-farm employment

may even compound differentials in agricultural income. Though we observed earlier in our multivariate analysis of employment patterns that the number of days worked in the non-farm sector was inversely related ($\beta = -.12$) to days worked in agricultural wage labor (an important component of agricultural income), we did not look at the relationship between incomes generated from these two sources. Looking now at this correlation we find that households generating large agricultural incomes also tend to generate higher incomes in the non-farm sector ($r = .08$, significant at .01 level).

Table 6. Percent of Households, Total Income, On-farm and non-farm by Farm Size Group

Farm size (in Ha)	% of Households	% of Total Income	% of Agric. Income	% of Non agri. Income
< .25	6.7	3.6	2.9	8.6
.25 - .50	19.1	12.0	10.8	19.8
.50 - 1.0	32.0	27.5	28.3	21.1
1.0 - 2.0	24.4	28.7	30.0	21.1
2.0 - 3.0	11.1	16.4	16.4	16.2
> 3.0	6.7	11.8	11.6	13.2
Total	100.0%	100.0%	100.0%	100.0%
(Gini coeff=)		(.19)	(.21)	(.08)

Since farm size is highly correlated with total household income ($r = .46$) one might suppose that the same pattern of income distribution would hold true for farm-size categories as for income groups. Table 6 tells us that while total household income is, indeed, concentrated on the larger farms (Gini=.19), the distribution of non-farm income

is considerably more equitable (Gini=.08) than is agricultural income (Gini=.21), contrary to the pattern of findings in the previous table. These findings suggest that non-farm employment can, in fact, help narrow the income gap between large and small farmers. But because a small group of large farmers tend to have higher levels of training, hold higher paying jobs in the non-farm sector, and treat their farms as business enterprises, their incomes from this combination of sources tends to be disproportionately high. Thus, when comparing income classes (as opposed to a farm size classes) the effect of non-farm employment is to create even greater disparities in total income.

CONCLUSIONS

The findings of this study permit us to conclude that the inheritance and accumulation of landholding can take us a long way toward understanding income inequalities in Rwanda, but not all the way. For those whose holdings do not permit an escape from poverty, their labor endowment may -- not through agricultural wage labor, but through employment in the non-farm sector. Households that have managed to secure both land resources and the skills necessary to participate in the non-farm sector put themselves in an exceptional position vis-à-vis the generation of income and accumulation of wealth. Households of this type also tend to use their resources to their fullest advantage; by working off the farm themselves and

hiring large amounts of farm labor they maximize income from farm production.

At the other extreme, we find the near-landless farm household with little formal education and no training for alternative employment. Though not the largest identifiable group, farmers with less than 0.5 hectares of land, no schooling and no non-farm income are numerous, account for 26% of Rwanda's rural population. Providing for these households, which, underemployed on their own farms, have begun to rely on the meager wages they earn as day laborers, will require heavy investment in the rural non-farm sector, in particular, in areas where poor and landless households can be competitive. Yet, since non-farm employment currently accounts for only 12.7% of total rural income in Rwanda, its effect on reducing inequality at this stage is minor. As non-farm employment opportunities begin to grow we can expect that they may further counterbalance income inequalities rooted in distribution of landholding.

Specifically, we must begin with a comprehensive study of rural non-farm employment in Rwanda, such as that currently under way in the Ministry of Planning. Not only is it important to survey the individuals and households engaged in this sector, but also the owners and would-be owners of the small enterprises that drive this sector. Those enterprises showing the greatest promise for growth must be identified. Credit, training and extension programs supportive of these industries must be reinforced. And

equally important Rwanda must look ahead and stimulate growth in areas that will be responsive to domestic and international markets of the future.

In the interim, young men and women in Rwanda are saying that they wish to follow in the path of their parents and become farmers themselves; yet 85% of these young people, and the majority of their parents, believe that they will not inherit enough land for the subsistence needs of their families (Clay et al., 1989). Among the 85% of young men in Rwanda who believe they will not inherit enough land to meet their families' needs, nearly a quarter expect to have no other options than to make future careers as agricultural laborers; others expect to migrate in search of employment; none believes that the strategy of saving their earnings in order to purchase additional landholding holds any promise for the future. Those who expect to acquire the skills necessary to participate in the non-farm sector are few. Though most parents have an opinion about how their children should plan for the future, an alarming 26% indicate that their children will have to make do on their own.

In the light of these findings, one must conclude that the primary challenge facing parents, communities and government officials today will be to overcome the advantages of land ownership by providing the nation's less fortunate young men and women with the skills, access to

credit and guidance necessary to build a future beyond the encroaching hedgerows of their family inheritance.

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