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Income Sources Diversification: Empirical Evidence from Edo State, Nigeria

Reuben Adeolu Alabi

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Zusammenfassung

Die vorliegende Studie untersucht Strategien der Diversifizierung von Einkommensquellen in Entwicklungsländern und deren Auswirkungen auf Armut mit einer empirischen Prüfung des Edo State, Nigeria. Die Studie zeigt, dass 43% aller Gesamteinkommen in Entwicklungsländern in Afrika und Lateinamerika und 51% in Asien nicht von der Landwirtschaft stammen. Die Untersuchung im Edo State ergab, dass 46% der Einkommen diversifiziert sind. Haupteinkommensquellen der Bevölkerung des Edo State sind Löhne und Gehälter (33%), Mieteinnahmen (33%), Verkaufseinnahmen von Agrarprodukten (14%) sowie der Handel (7%). Es zeigt sich zudem, dass Einkommen durch höhere Bildungsgrade steigen, beginnend mit der Mittelstufe (junior secondary) bis zum Universitätsabschluss (first degree) als höchstmöglichen. Diese Studie zeigt zudem deutlich, dass sich Haushaltseinkommen mit Zunahme der Einkommensquellen erhöhen und dass fünf unterschiedliche Einkommensquellen je Haushalt das Optimum mit dem höchsten Durchschnittseinkommen darstellen. Die Regressionsanalyse belegt ferner, dass die Anzahl der Einkommensquellen, der Bildungsgrad sowie der Wohnort die Höhe der Haushaltseinkommen positiv und signifikant beeinflussen. Die Geschlechter der untersuchten zeigen keinen signifikanten Einfluss auf die Haushaltseinkommen im Edo State. Daraus erschließt sich, dass die Haushaltseinkommen im Edo State durch höheren Zugang zur Einkommensquellendiversifikation steigen. Möglichkeiten zur Diversifikation von Einkommensquellen im Edo State werden in dieser Studie ausführlich diskutiert.

Abstract

This study reviews the cases of income sources diversification in developing countries and concluded with empirical evidence from Edo state, Nigeria. It shows that non farm income as share of total income in Africa and Latin America was 43%, while it was 51% for Asia. The empirical evidence from Edo state in Nigeria indicates that 46% of the people have a well diversified portfolio. The evidence from Edo state shows that the major sources of income in Edo state are wages and salary (33%), rent from assets (33%), sales of farm produce (14%) and trading (7%). It also indicates that income increases with level of education, with Junior Secondary school education being the lowest and First degree being the highest. The empirical evidence also indicates generally that income increases with increase in number of income sources and five income sources being the optimum that gives the highest mean income. The regression analysis shows that income sources diversification, education and location are positive and significant determinants of income, while gender has non-significant relationship with income in Edo state. These findings suggest that the increase in opportunity for people to diversify their income base will increase their household income. Those opportunities were recommended in this paper.

Keywords: Income Sources, Diversification, Edo State, Nigeria

Stichwörter: Haushaltseinkommen, Diversifikation, Edo State, Nigeria

JEL-Classification: QO, I3, N5, R2

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ANOVA	Analysis of Variance
CBO	Community Based Organisation
CFA	Currency for French African Countries
CLUSA	Cooperative League of United State of America
CPD	Centre for Policy Dialogue
DAC	Development Assistance Committee
FAO	Food and Agriculture Organisation
HIV	Human Immunodeficiency Virus
IFPRI	International Food Policy Research Institute
MFI	Micro Finance Institution
NBS	National Bureau of Statistics
NF	Non Farm
NGO	Non Governmental Organisation
NISH	National Integrated Survey of Households
ODI	Overseas Development Institute
OLS	Ordinary Least Square
POVNET	Poverty Network
RNF	Rural Non Farm
RNFE	Rural Non Farm Employment
RNFI	Rural Non Farm Income
UK	United Kingdom

1 Introduction

Diversification has been demonstrated to be maintenance and continuous adaptation of a highly diverse portfolio of activities in order to secure survival that is a distinguishing feature of rural livelihood strategies in contemporary developing countries (Sahn, 1994). The household level of income diversification has implication for rural poverty reduction policies, since it means that conventional approaches aimed at increasing employment, incomes and productivity in single occupation, like farming may be missing their target (Ellis, 1998). Very few people in developing countries collect all their income from any one source, hold their wealth in the form of any single asset or use their assets in just one activity (Reardon, 1997).

Participation in multiple activities by farm families is of course, not new, nor only confined to the rural sector of developing countries. In the industrial countries diversification in literature has been referred to as pluractivity (Evans and Ilbery, 1993). There is recognition of the likelihood of its increased prevalence as agricultural income support are gradually being removed (Hearn et al, 1996); it also as much characterizes the livelihoods of the urban poor as the rural poor in developing countries. Past studies show that between 30-50% of household income in Sub-Saharan Africa is derived from non-farm sources (Reardon, 1997). In the African continent, non-farm sources may already account for as much as 40-45% of average household income and seen to be growing in importance (Little et al, 2001). As elsewhere, the Rural Non Farm Employment (RNFE) has been growing rapidly. All these emphasise that people in developing countries got their income from different sources. Since these sources do not have the same potential contribution to their income, it is important to investigate these different sources and their contribution to income of the people in the developing countries. This study attempts that, using empirical case of Edo state, Nigeria. The Study specifically examines income sources diversification and its effect on income in Edo state. It also reviews the empirical cases of income diversification in developing countries. The rest of the paper is divided into eight sections. Section two reviews the theory of income source diversification, section three presents

determinants of income source diversification, section four deals with relationship with income sources diversification, inequality and poverty, section five relates income diversification with household welfare, section six is on cases of income source diversification in developing countries, section seven examines the empirical case of Edo State and section eight concludes the paper.

2 Review of Theory of Household Income Sources Diversification

The rural household or individual's decision to supply labour to the rural non-farm sector can be conceptualized as a specific application of the class of behavioural models of factor supply in general, and labour in particular (see Sadoulet and de Janvry, 1995, for the economic theory of general factor demand and supply models; and Rosenzweig, 1989, for labour market models). Economists model the labour supply as well as capital investment (for own-enterprise start-up 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 labour supply and capital investment decisions, for our present purposes is “diversification” into non-farm activity. Then, according to Reardon et al (2006), the diversification choice can be decomposed into five interdependent and simultaneous choices. They are (1) Non-farm participation: choice of farm sector activity (as producer or wage-labour 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 (a) the set of incentive “levels” facing the household, including rela-

tive prices of outputs from and inputs to activity *j* versus activities *k*, (b) 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 (c) 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.

Diversification is widely understood as a form of self-insurance in which people exchange some foregone expected earnings for reduced income variability achieved by selecting a portfolio of assets and activities that have low or negative correlation of incomes (Alderman and Paxson, 1992). The notion of self-insurance is an *ex ante* concept of risk mitigation. Coupling weakly covariate pursuits diversified across sectors (e.g. crop production and seasonal metal-working) or space (e.g. migration) can reduce household income variability. If, as is widely believed, risk aversion is decreasing in income and wealth, then the poor will exhibit greater demand for diversification for the purpose of *ex ante* risk mitigation than do the wealthy. The fact that diversification rises with wealth or income in both absolute and proportional terms in rural Africa (Barrett et al., 2001) underscores that risk mitigation cannot satisfactorily explain observed patterns of non farm activity on the African continent. Multiple motives prompt households and individuals to diversify assets, incomes, and activities. The first set of motives comprise what are traditionally termed “push factors”: risk reduction, response to diminishing factor returns in any given use, such as family labour supply in the presence of land constraints driven by population pressure and fragmented landholdings, reaction to crisis or liquidity constraints, high transactions costs that induce households to self-provision in several goods and services, etc. The second set of motives comprise “pull factors”: realization of strategic complementarities between activities, such as crop-livestock integration or milling and hog production, specialization according to comparative advantage accorded by superior technologies, skills or endowments, etc. These micro level determinants of diversification are mirrored at more aggregate levels. From the “push factor perspective”, diversification is driven by limited risk-bearing capacity in the presence of incomplete or

weak financial systems that create strong incentives to select a portfolio of activities in order to stabilize income flows and consumption, by constraints in labour and land markets, and by climatic uncertainty. From the “pull factor perspective”, local engines of growth such as commercial agriculture or proximity to an urban area create opportunities for income diversification in production- and expenditure-linkage activities. The consequence of the ubiquitous presence of the above factors in rural Africa is widespread diversification.

Barrett et al (2001) identify four distinct rural livelihoods strategies offering markedly different returns distributions. Some rural African households depend exclusively on their own agricultural (animal or crop) production for income, what is termed the “full time farmer” strategy. Others combine own production on-farm with wage labour on others’ farm, which is referred to as the “farmer and farm worker” strategy. The other two strategies combine farm and non-farm earnings. Within this population, Barrett et al (2001) drew a distinction between those who undertake unskilled labour – whether in the farm or non-farm sectors – and those who do not. The “farm and skilled non-farm” strategy does not include unskilled labour and tends to be associated with higher income households with relatively better-educated or skilled adult members. The fourth “mixed” strategy combines all three basic elements discussed so far: on-farm agricultural production, unskilled on-farm or off-farm wage employment, and non-farm earnings from trades, commerce and skilled (often salaried) employment. This classification scheme underscores the importance of labour market dualism in poor, rural regions; returns to labour vary substantially. These four household livelihood diversification strategies do not offer similar returns. In comparative work across different African agro-ecologies, Barrett et al (2001) found that strategies including non-farm income stochastically dominate those based entirely on agriculture, while the farm and skilled non-farm and full time farmer strategies generally offer superior returns to the mixed and, especially, the farmer and farm worker strategies, respectively. These differences arise due to variation in the degree to which each strategy involves barriers to entry. Pursuit of the full time farmer strategy requires either sufficient ex ante

land endowments or the financial or political means to secure access to additional land. On-farm production may include food crops, cash crops or livestock, and output may be sold to market, retained for home consumption, or both.

3 Determinants of Income Sources Diversification

The factors that affect income sources diversification are discussed below:

Education: The existence of a positive link between access to, and level of, education on one hand and involvement in the more remunerative non-farm activities on the other is virtually undisputed in the literature (Lanjouw, 1999). According to Gordon and Catherine (2001), there are several processes that reinforce the effect of education on incomes. Education increases skill levels, which are required for some rural non-farm (RNF) activities, or contribute to increased productivity, or may be an employment rationing device. Education can set in train processes that increase confidence, establish useful networks or contribute to productive investment (exposure outside the home village, migration, using improved earnings to educate other family members or invest in rural enterprise). Education tends to be closely correlated with other variables that also improve access to higher income employment (pre-existing wealth, useful social networks and confidence). Non-educated family members may benefit from advice given by more educated relatives. Reardon (1997) cites a number of authors who have addressed the importance of education and skills as determinants of business start-ups and wages earned off-farm in Africa. Better-educated members of rural populations have improved access to any non-farm employment on offer, and are also more likely to establish their own non-farm businesses. Educational attainment proves to be one of the most important determinants of non-farm earnings, especially in more remunerative salaried and skilled employment. Better educated individuals are more likely to migrate to take up employment opportunities in other areas, as they have greater chances of success than their less-educated or uneducated coun-

terparts. Reardon (1997) infers a self-perpetuating effect of education in the long term: earnings from migration may be invested in the education of individuals within the migrant's household, which gives new generations a continuing advantage in the non-farm sector. Over time, this appears to lead to a dominance of the non-farm sector by a subset of local families. It seems that a tradition of involvement in the non-farm sector develops, and members of a household build up confidence in their ability to succeed in that sector. Reardon et al (1998) indicate that education is one of the first major investments of farmers in cash-cropping zones, illustrating the point with evidence from cotton-growing areas in Mali following the 1994 devaluation of the CFA franc. Indeed there is ample evidence from rural poverty surveys that underline the importance that the poor attach to the education of their children.

Islam (1997) argues that primary education enhances the productivity of the workforce, whilst secondary education stimulates entrepreneurial activity. In addition, being educated by themselves, entrepreneurs are better equipped to train employees on-the-job. Islam (1997: 21) also cites interesting work in Ghana that explores the wider family impacts of one person's education. He stated that "A recent survey ... concludes that not only do the years of schooling of entrepreneurs and family workers employed in the enterprise have an impact on incomes of such enterprises but also the education of other family members who are not directly employed in the business" (Vijverberg, 1995) "... those who are not directly employed in the enterprise ... contribute indirectly through discussion and suggestions. The crossover effects are significant when entrepreneurs are not educated ...".

Vocational Training: Small business development projects often offer a range of services including education in business skills. Vocational training in traditional trades (baking, brick-making, building skills, handicrafts, workshop repairs and so on) may also be offered at specialized colleges, or sometimes as part of school curricula. Some organizations run short courses targeted to local needs.

Although several authors indicate the importance of specialist skills (e.g. Reardon et al. 1998; Lanjouw, 1999; Bryceson, 1999), and projects and beneficiaries alike stress this dimension to business development, there seems to have been relatively little systematic study of the impact of alternative approaches to vocational training in African countries. Certainly, there are many ways in which such services can be provided (e.g. government-run specialized training centres, private training institutes, NGO or project-run courses delivering training in formal or informal ways, vocational training as part of school curricula, or as part of the services offered by agricultural extension teams). As a consequence the evidence is rather piecemeal. Islam (1997) argues that small business development programmes need to take care that the services they offer are tailored to the requirements of the individual enterprise. Jeans (1998) observes that organizations that provide skills and training for enterprise development are increasingly charging for these services. Cost-recovery (even if partial) facilitates wider coverage and, more significantly, it has been found that charging a fee increases the proportion of trainees who actually make effective use of their training. However, it is not clear whether this arises from an enhanced degree of motivation, or whether ability to pay for training also implies access to the necessary financial base or stability from which to launch a new business. Tovo (1991) studied women receiving small business training in Tanzania in 1989. Her findings suggest a positive impact from training and extension services. These were offered by the Government of Tanzania in a variety of fields including co-operatives, home economics, community development, small-scale industry development and agriculture. She found that extension services have been particularly helpful, as is evident in the success rate achieved by those who received training or extension. She suggests that those putting themselves forward for such services may be more dynamic and entrepreneurial individuals, the implication being that they would in any case show a greater degree of success in their enterprise, with or without assistance. She also suggests that during their training courses, the women may have made contacts that contributed to the success of their businesses. In their research on women's enterprise in Mo-

zambique, Horn et al (2000) found that respondents recognized their need for training in the management of money as a prerequisite for success in business. This is likely to be applicable to all farm and non-farm business since micro-entrepreneurs tend not to keep detailed records of income and expenditure and, therefore, find accurate financial planning and cash flow forecasting difficult, if not impossible. Work by the Co-operative League of the USA (CLUSA), also in Mozambique, stresses financial skills, as well as business and marketing planning, in their training of farmers' groups (Kindness and Gordon, 2001).

Health: There is no doubt that the health status of household members has a significant bearing on their participation in income-generating activities. While this general rule applies to health in its broadest sense, at the present time in parts of Sub-Saharan Africa concerns about health tend inevitably to focus on HIV/AIDS. White and Robinson (2000) outline the considerable extent to which HIV/AIDS has impacted on household livelihoods in Sub-Saharan Africa. Many of their conclusions might be equally applicable to health problems other than AIDS.

HIV/AIDS is particularly relevant to this discussion as it often results in the loss of household members who are at the peak of their productivity, and potentially have most to contribute to the livelihood of the household. Productive time and material resources are further lost in caring for those afflicted with the disease, and households may have the additional burden of having to take in orphans or other dependants of the person in question. Coping strategies to tackle this situation mirror to some extent the strategies used by rural households for coping with other shocks, for example, diversifying income sources or migrating to seek work (however, migration has also been found to be a significant factor in the spread of AIDS). Some of the coping strategies adopted by AIDS-afflicted or AIDS-affected households may have negative long-term effects on livelihoods, for example, withdrawing children from school to assist with household tasks and to save money. White and Robinson (2000) argue that the full impact of the epidemic will only be known in the future, when these wider effects of reduced investment in human capital become evident. White and Robinson (2000) found that as a result of

the impact of HIV/ AIDS on household livelihoods, there appears to be growing reliance on non-farm income-generating activities. Households already involved in a fairly large number of such activities, as well as agriculture, were better able to buffer themselves against the impact of HIV/AIDS. They further suggest that the commercial sector offers employment opportunities to, for example, AIDS orphans who have no access to land and require an income to support themselves. Islam (1997) discusses the importance of investment in health more broadly, which results in reduction in morbidity and improved nutrition, and thereby increases labour productivity, in both farm and non-farm sectors. Families, who have limited access to health facilities, whether for reasons of location or affordability, inevitably suffer the consequences in loss of potentially productive time. In their research in Uganda, Smith et al. (2001) note that the RNF activities of the poor are often more demanding physically. Respondents recognized that good health was important to their ability to earn RNF income.

Personal Vision: Very little has been written about personal vision as a possible determinant of participation in the non farm sector. It is nonetheless interesting to consider a finding of Horn et al. (2000) that the potential of the women interviewed in Mozambique was severely constrained by their inability to see themselves in situations very different from those in which they currently live. This may be a result of years of war and poverty, and may not apply very widely, but may equally be relevant in particularly isolated areas, where limited contact with others results in narrow perceptions of what is possible. Improvements in communication and travel may reduce the significance of this factor. Limitations of personal vision may also relate to the issue of confidence touched on briefly above. Those individuals or households with little or no experience of the non-farm sector may not trust their ability to participate successfully, and may decide to settle for lower returns from agricultural activities, in which they feel more confident. The women interviewed by Horn et al. (2000) were risk-averse, fearing living their lives differently, although there was evidence that with age, women were willing to adopt new activities.

Age: Several authors address the significance of household members' age in relation to their participation in the non-farm sector. It is a dimension of human capital and although it may not be amenable to change (except in the aggregate), it is important to understand how it affects participation in the non-farm sector. Smith (2000) notes that it is generally the younger household members who migrate in search of non-farm, income-earning opportunities, and he points out that age is a factor synonymous with moving into the non-farm sector more broadly. Bryceson (1999) considers that both gender barriers and barriers to youth involvement in the non-farm sector are declining. She points out that through the expansion of the service economy; youth have been afforded cash-earning opportunities that were previously lacking. Horn et al. (2000), in their research on women's enterprise in Mozambique, note that as women mature they are more likely to take up business opportunities. This finding relates to a particular cultural context, in which traditionally women were in stable, long-term family situations, depending on their husbands for the household's cash needs. However, with more break-up of marriages and a greater number of shorter duration, non-married situations, more women realize that they have only themselves on whom to depend and, therefore, enter the non-farm sector later than they might otherwise. Women with childcare responsibilities are also somewhat confined to home-based activities, until their children can be left with others in the home. This means that women in their late twenties and older were found to be more active in non-farm activities which involved periods away from their homes.

Social Capital: Social capital comprises the social resources (e.g. networks, membership of groups, relationships of trust, access to wider institutions of society) upon which people draw in pursuit of livelihoods. There is ample anecdotal evidence of the influence of social capital on access to different types of employment, and an increasing amount of empirical research that supports this also (Lanjouw, 1999).

Gender: There is general consensus in the literature that gender is a significant factor determining access to RNF opportunities. As Griffith et al. (1999) remind us, the majority of the poor in Sub-Saharan Africa are

women. They have, therefore, greater need than most for the income that can be secured through involvement in the non-farm sector. Women have long been constrained in the activities in which they are permitted or able to participate, by tradition, religion, or other social mores. Both Ellis (1998) and Newman and Canagarajah (1999) point out the activities in which women are involved are more circumscribed than those for men. As far as non-farm income is concerned, women participate to a greater degree in wholesale or retail trade or in manufacturing, than in other sectors. Haggblade et al. (1987) provide data from five African countries (Benin, Ghana, Nigeria, Kenya and Zambia) where women's share in non-farm employment ranged from 25% to 54%. It may be significant, however, that this group includes three West African countries where women traditionally play an important role in trade, and Zambia where male migration to work in the mines has left a high proportion of female-headed households in rural areas. For reasons of differential access to education, childcare responsibilities and social expectations, women are more involved in the informal sector than the formal sector. Figures quoted by Haggblade et al. (1987) for Ghana and Kenya show women's share in formal employment as 10% and 14%, respectively, compared with 54% and 25% in informal, small enterprises. Women also tend to engage in businesses that require lower start-up capital than those in which men become involved. Women's involvement in income-earning opportunities has greater significance than simply increasing their own or household income. Islam (1997) argues that it strengthens their decision-making power within the household; and it helps to limit family size, and improves child nutrition and education. Bryceson (1999), using evidence from seven country studies in Africa, goes further than most, in concluding that gender barriers are declining rapidly. In worsening economic circumstances, men have had to accept that their wives and daughters can and should work outside the home to earn money. However, this has not been balanced by a lessening of women's household duties; they remain responsible for raising children and caring for the family. Contrary to other writers, Bryceson finds a breakdown in patterns of work ascribed strictly to men, or alternatively to women, and she notes the broad

nature and range of activities currently pursued by women. Tovo (1991) found Tanzanian women having to provide both food and cash for their families, as a result of the erosion of the subsistence base in rural areas and the decline in real wages. In some cases, women were left solely in charge of the home, farm and family as a result of men migrating to urban areas, though this is often within the context of the extended family. Horn et al. (2000) similarly found Mozambican women having to seek means of supporting themselves and their families, as traditional family structures have weakened and stable long-term relationships are no longer the norm. White and Robinson (2000) discuss the increase in female-headed households which has resulted from the incidence of HIV/ AIDS. The disease may also lead to the loss of women's assets, such as land, following the deaths of husbands, thereby increasing 'distress-push' into the non-farm sector. Newman and Canagarajah (1999) found in both Ghana and Uganda that female participation in non-farm work is increasing. During the periods studied, their findings were that poverty rates in both countries fell most rapidly among female household heads engaged in non-farm work. Their research considered sub-groups within the overall group of women, including female heads of households, female spouses and 'other females'. Interesting differences were found in the extent of involvement of those sub-groups in non-farm activities. Working females with the greatest responsibility for family welfare, i.e. heads of household and spouses, were more active in non-farm activities than 'other women'. Women in both Uganda and Ghana work primarily in agriculture, but among secondary activities, women were more likely to be involved in non-farm work than men. Newman and Canagarajah (1999) also found that women in Ghana and Uganda earned substantially less than men. In relation to the gender profile of migrant labour, Smith (2000) suggests that although historically the majority of migrants were men, this varies within and between regions, and over time, depending on the types of employment available for women and men in rural and urban economies. Women's household responsibilities are more likely to prevent them from spending extended periods away from the home. White and Robinson (2000), point out that female-headed households have long

been identified as being especially vulnerable to poverty. In their work on the impact of HIV/AIDS in Sub-Saharan Africa, they note the increase in female-headed and youth-headed households as a result of the spread of the disease. The implication is that female heads of household in particular will be an increasingly important target group for initiatives aimed at increasing the contribution of the non-farm economy to rural livelihoods.

Religion: Several authors note the influence of religious factors on participation in the non-farm sector, always in relation to women's involvement. Haggblade et al. (1987) observe that social and religious norms may tightly shape the economic options available to women. They use the example of a Muslim country, Chad, to illustrate the lower participation of women. In their work in Mozambique, Horn et al. (2000) report that home-based activities were most common among Muslim women. A different aspect of the influence of religion is highlighted by Tovo (1991), who reports that in Tanzania, Christian women are more 'risk-taking' than Muslim women.

Networks: Individuals and households with better social networks have greater opportunities in the non-farm sector. Once again, this discriminates against the poorest, who suffer a lack of (useful) social networks and are, therefore, unable to capitalize on informal opportunities and remain excluded from formal support systems (Smith, 2000). Gordon et al. (2000b) are reporting that the ability to migrate and the choice of destination for migration are influenced by social networks. Typically, men will migrate to areas where they already have relatives or friends, on whom they can rely for initial support and information. They might also learn of employment or business opportunities through friends or family who are already involved in the non-farm sector. Tovo (1991) found that the women she interviewed in Tanzania had made some important contacts through training or extension in which they were involved. These contacts helped them to obtain scarce inputs for their businesses and to find customers. Fafchamps and Minten (1998) attempted to quantify social capital amongst agricultural traders and their clients in Madagascar using a questionnaire based sample survey for data collection and econometric techniques for analysis of data. They defined

social capital in two ways: as a 'stock' of trust and an emotional attachment to a group or society at large that facilitates the provision of public goods, and as an individual asset that benefits a single individual or firm. The latter is sometimes referred to as social network capital to emphasize that agents derive benefits from knowing others with whom they form networks. Using regression analyses, Fafchamps and Minten (1998) demonstrate that social network capital raises total sales and gross margins. They identify several quantifiable dimensions of social capital, including the number of traders that the respondent knows, the number of friends and family who can help with an enterprise, and the number of suppliers and clients that the respondent knows personally. They use regression analysis to determine the returns to these dimensions of social capital. From a policy perspective, an interesting question concerns the amenability of networks to intervention. There are many examples that demonstrate how the development of useful networks can be promoted through deliberate government or aid project interventions. However, there has been little systematic study of these results, as distinct from the effects of other components of the same programme. For instance, an initiative to develop community groups could yield a number of separate benefits including: Improvements in human capital through group literacy and numeric training; improved access to loans through group lending mechanisms; improved crop marketing as a result of crop assembly; improved crop marketing through facilitation of farmer proactive contact with traders; improved leverage with government through organization, representation at other forum and capacity to speak on issues of concern to the whole community. The initiative, therefore, helps to develop social capital: within the group, between the group and trader networks, and between the group and other networks. Tovo (1991) observes that training also exposed women participants to contacts who were useful to their subsequent business activities. Islam (1997) discusses the role that personal contacts have played in sub-contracts between urban and rural enterprise. The most successful examples of such arrangements have developed without state intervention, but there may nonetheless be meas-

ures that could be taken to promote such relationships, such as government-supported work experience or apprenticeship schemes.

Family Size and Structure: The structure of rural families plays a significant part in determining access by individuals to non-farm opportunities. Reardon (1997) observes that family size and structure affect the ability of a household to supply labour to the non-farm sector. Larger families and those with multiple conjugal units supply more labour to the RNF sector, as sufficient family members remain in the home or on the farm to meet labour needs for subsistence. Smith (2000) applies the same logic to migration opportunities, observing that extended family structure influences access to migration. In this case, the longer absences involved make it all the more important that those remaining in the home are able to supply the basic labour required for subsistence. The work of Bryceson (1999), Tovo (1991) and Horn et al. (2000) indicates how family structure and traditional roles have had to adapt to allow broader participation in the non-farm sector. Tovo (1991) describes a situation where this is needs-driven. Bryceson (1999) also seems to portray the removal of age and gender barriers as a positive outcome of deterioration in traditional livelihoods, although she notes that the assertion of economic autonomy by formerly dependent women and youth is at the expense of social cohesion in the short term.

Roads: In his review of literature relating to diversification, Ellis (1998) observes that in Africa, poverty can be largely explained in terms of location, and lack of access to facilities. When asked what improvements in their circumstances they would most like, villagers most frequently cite road access. The majority of African farmers currently 'head-load' their produce to local markets, however, improvements in transportation can also usher in increased competition for rural enterprises, formerly protected by their remoteness. Islam (1997) points out that improvement of infrastructure do not only increase the supply of competing products, they can also contribute to a change in rural tastes and preferences, towards more urban products. Reardon et al. (1998) comment that the distributional impact of road improvements is uncertain and will depend on the involvement of lower-asset households in activities favoured or harmed

by improved market integration. Certainly access to employment in rural towns will improve. Moreover, proximity to cities and mines, when coupled with efficient transport links, tends to increase the importance of remittance income in overall rural incomes.

Electricity: Power is another critical component of infrastructure. Electricity helps to create increased RNF opportunities in several ways: by enabling the development of enterprise for which electricity is a prerequisite; by reducing the costs of, for example, diesel-powered, small-scale milling to a viable level; by providing lighting and hence increasing the hours that can be spent in (selected) RNF activities; by releasing labour from time-consuming and low productivity chores such as manual pounding of grain. Of these, the first is perhaps the most obvious and receives most attention in the literature. However, the others may have far-reaching poverty impacts, particularly on women. The importance of the release of labour from low productivity tasks in agriculture has been noted by many authors (e.g. Reardon et al., 1998), but the release of women from low productivity household and income-generating activities generally receives much less attention in this context. There is also an issue of cause and effect: women tend to take-up labour-saving technologies (e.g. custom milling) in response to two separate factors – sufficient income to pay for custom milling and a fall in the price of custom-milling. There may also be indirect and long-term effects. Respiratory disease is widespread in Africa and partly attributed to the smoky environment in which many rural households live. Fires do not just serve as stoves, they are often kept going to provide light and (sometimes) warmth. Less dependence on this source of light should have long-run, knock-on effects on health and labour force participation.

Telecommunications: Improvement in the cost and coverage of telecommunications reduces transaction costs, by improving information flow. Other things being equal, this should contribute to development of rural enterprise, particularly relative to the poor telecommunications access that has been the norm for many rural communities. Advances in technology, as well as card phones and mobile phones, are contributing to rapidly expanding networks, lower costs and more affordable telephone sys-

tems. In some countries, phones themselves create a small business with land lines and mobile phones ‘rented’ to occasional callers.

Financial Capital: One of the principal problems for rural households and individuals wishing to start a business, whether in the farm or non-farm sector, is access to capital or credit. Without start-up funds, or with only little cash available for investment, households are limited to a small number of activities which yield poor returns, partly because of the proliferation of similar low entry barrier enterprise. In the same way, individuals with little or no personal savings may find themselves unable to meet the ‘start-up’ costs of migration. Islam (1997) cites the results of a four-country study in Africa where 30–84% of rural industries complained of poor access to credit – next in importance to lack of infrastructure inputs and markets. Land is often required as loan collateral and this can exacerbate income inequality associated with RNF activity. Reasons for market failure in credit include: the lender does not know the default risk of each potential borrower and to collect this information is costly; moreover there is an associated moral hazard problem that rural credit programmes may attract borrowers with no intention to repay; it is costly to ensure that the potential borrowers take those actions which make loan repayment more likely; it is difficult and costly to enforce repayment. The cost of providing services to the rural poor is high because they are located in remote areas, want to borrow small amounts, and illiteracy, lack of experience of banks and lack of collateral necessitate the development of tailored approaches.

Constrained access to credit and financial savings, where access is an increasing function of ex ante income and wealth, for reasons familiar in the development economies literature, can impede acquisition of livestock necessary to diversify out of crop agriculture (Barrett et al, 2000) and useful assets such as machinery, trucks, warehouse, essential to many remunerative non-farm activities in manufacturing and commerce (Barrett, 1997). Those entry barriers tend to leave the poor with less diversification asset and income portfolios. Ironically, RNF activities are both a response to, and a consequence of, failure in credit markets. They are a response in the sense that rural households use RNF income to substitute

for other sources of agricultural investment, and a consequence in the sense that the nature of RNF activity might be different were credit more readily available for rural business start-ups. A further response to the failure in credit markets has been the development of micro-credit initiatives. Sound schemes targeted to the poor tend to be characterized by: small, short-term loans, and savings mechanisms; simplified loan appraisal procedures; innovative approaches to collateral; rapid approval/disbursement of repeat loans after repayment; high transaction costs; high repayment rates; savings and loan services provided at a location and time convenient for the poor.

Thus, micro-credit schemes are often associated with group-lending (where peer pressure effectively substitutes for collateral, and other group members may take action to prevent one member defaulting, for instance, by providing labour to assure timely harvest), extension inputs arranged by the Micro-Finance Institutions (MFIs), and mobile banking arrangements. Cash flow analysis may concentrate on overall ability to repay the loan rather than a particular investment project. In some respects, MFIs try to imitate the strengths of the informal sector (using local information to ensure repayment, for instance) and some MFIs are experimenting with ways to link their operations with some of the informal sector financial agents. Whilst there is wide and growing experience with micro-credit, the vast majority of rural people do not have access to any such scheme. Many authors comment on the consequent importance of informal sources of credit. Gordon (2000) highlights the importance of funds available from friends and family in meeting unforeseen needs, or in investing in non-farm enterprise. These are, however, inadequate, since household expenditure follows a similar seasonal pattern in rural areas, with everyone's need arising at the same time, i.e. when food supplies are running low and the next crop is not yet ready for harvesting. Reardon (1997) observes that own cash sources, or financing from moneylenders, are an important determinant of capacity to start non-farm businesses or to obtain employment. Horn et al. (2000), however, found that women in Northern Mozambique generally chose not to borrow from family members, due to the potential for problems if they were unable to

repay the loan. The requirement for cash as start-up capital for non-farm enterprise may be to meet regulatory requirements, as much as, if not more than, any investment in physical capital. An example is given by Horn et al. (2000) in relation to women in Mozambique. Those wishing to prepare and sell food, a business particularly favoured by women, are required to obtain a sanitary certificate from the health department, indicating that they and their premises are free from health risks. Even though their businesses can be closed down if they are unable to produce this certificate, the authors observed that few women actually met this requirement, due to the prohibitively high cost of the certificate relative to the meagre profits realized from the business. A similar problem arises with the registration of farmers associations in Mozambique – though in this case it is exacerbated by the time taken to process the applications, which can run into years.

Urbanization: Urbanization has been an important driver of diversification in recent years, offering many new opportunities; the flow of money, and goods and services between rural and urban area can create a virtuous circle of local economic development by increasing demand for local agricultural produce, stimulating the non-farm economy and absorbing surplus labour (Tacoli, 2004). But this is crucially dependent on three prerequisites; access to infrastructure, trade relation and market information (DAC, 2004).

Natural Capital: Natural capital comprises the natural resources, such as water, land and common property resources that are so central to rural livelihoods. These resources provide a foundation for farming and also for much of the RNF economy. The influence of natural capital on non-farm activities is felt in several ways: through forward and backward linkages between agriculture, postharvest activities and agricultural inputs and services; through consumption multipliers, that magnify the effects of growth (or decline) in the farm economy; through linked labour markets for farm and non-farm activities and hence, transmission of higher wages in one sector to the other; through correlation between household access to land and other wealth-enhancing assets such as education, contacts, finance; through the knock-on effects of risk and vulnerability associated

with certain natural resource-based activities on the choice of RNF activities also pursued. A number of studies have sought to estimate the effect of additional agricultural income on non-farm incomes. Three results are important here: it seems that a more dynamic agricultural sector will generate stronger non-farm multipliers (which supports the 'agriculture as the engine of growth' model); the African multipliers tend to be smaller than those in Asia (which is consistent with a less dynamic agriculture); and in Africa, the consumption linkages tend to be stronger than the production linkages. Data from Sierra Leone and Nigeria revealed that an additional dollar of agricultural income would generate another 50 cents of non-farm income (Haggblade et al., 1989). As with the discussion of infrastructure, when considering the influence of natural capital on poor people's capacity to engage in RNF activity, there is some overlap with the incentive part of the equation. Natural capital and infrastructure contribute to improved availability of opportunities, as well as improved capacity to access those opportunities.

4 Income Sources Diversification, Inequality and Poverty

Non-farm activity plays an increasingly important role in sustainable development and poverty reduction in rural areas (FAO, 1998). It can be considered as an important way to increase overall rural economic activity and employment in many developing countries, non-farm activity often accounts for as much as 50% of rural employment and a similar percentage share of household income (Lanjouw, 1999). Average non-farm income share of the total is about 42% in Africa, 40% in Latin America, and 32% in Asia (World Bank, 2000). Earnings from non-farm activity can not only significantly increase total household income, but also function as a safety net through diversifying income sources (Zhu and Luo, 2006). Participating in non-farm activity enhances households' capability of overcoming negative shocks and investing in farm activity. It mitigates income fluctuation and enables the adoption of more profitable but "risky" agricultural technologies, which encourage the transformation of traditional agriculture to modern agriculture. Non-farm income may also

prevent rapid or excessive urbanization as well as natural resource degradation through overexploitation. The non-farm sector can hence function as a route out of poverty through reducing the pressure on the demand for land in rural areas.

There has been a debate on the role of non-farm income in rural inequality. Some studies show that although non-farm income increases total rural income, it worsens income inequality because it is more unequally distributed than farm income (Bright et al, 2000; Islam (1997). However, some other studies suggest that, if the poor households have a higher participation rate (in particular in casual wage activity) than rich households, non-farm income can reduce rural inequality Barham and Boucher (1998); Elbers and Lanjouw (2001); Escobal (2001); Khan and Riskin (2001); Leones and Feldman (1998). According to Zhu and Luo (2006), poor households in China gain more from non-farm activity than the rich households. One of the important reasons is that households that suffer stronger constraints in farm activity are more likely to participate in non-farm activity, and earn relatively higher income compared to those with better resources. Whether a household participates in non-farm activity depends on its incentive and capability. Households are motivated to undertake rural non-farm activity by either "pull" or "push" factors. If the non-farm sector has high returns, the "pull factors" will be strong; if farm activity cannot provide enough income for households (for example, if farm output is inadequate due to drought, flood, or insufficiency of land) or households need to diversify their income sources, the "push factors" may kick in. Poor households are less capable of weathering negative shocks, and are more risk averse. In order to have additional income as well as to diversify and undertake activities with returns that may have a low or negative correlation with those of farming, poor households may have stronger incentives to participate in non-farm activity; while rich households may have better capacity to do so thanks to their better endowments in physical and human capital (FAO, 1998). In rural China, the credit and insurance markets are underdeveloped. Households have strong incentives to diversify their income sources. However, because of their limited capacity and liquidity constraints, poor households tend to

participate in non-farm activity with a high labour to capital ratio and low entry barriers.

The high participation in non-farm activity among low-income rural households may result in a more equal distribution of total income. For example, Adams and He (1995) and Adams (1999) argue that non-farm income reduces overall inequality in Pakistan and in Egypt, respectively. They suggest that households with low farm income (because of unequal access to land, etc.) are more likely to engage in non-farm activity and the pro-poor distribution of non-farm income across the income scale of the population mitigates inequality.

5 Income Sources Diversification and Household Welfare

The recent literature on rural non farm sector (RNFS) in developing countries tends to suggest a mixed effect of non farm diversification on household welfare. Lanjouw and Lanjouw (1995) consider RFNSs as combination of both productive and non-productive activities. While the former is likely to raise living standards of rural households, the latter is described as 'residual' activities by rural households in response to short-falls of income (Pham et al, 2007). In this regard, the welfare effect of non-farm diversification depends on whether rural households are in a 'pull' or 'push' scenario. Some households may be 'pushed' into non-farm activities in their struggle to survive, while others may be 'pulled' into them by their desire to accumulate. As the 'pushed' scenario is usually referred to poor households and the 'pulled' is more likely associated with the non-poor, the welfare effect of non-farm diversification on rural poverty in general is no unequivocal. Ellis (1998) supports this argument and urges that non-farm participation may be associated with success at achieving livelihood security under improving economic conditions as well as with livelihood distress in deteriorating conditions. According to von Braun and Pandya-Lorch (1991) rural households seek non-farm activities either for 'good' or for 'bad' reasons. While the latter refers to the pressure on the poor to participate in the RNFS as a coping strategy, the former implies the attraction of the non-farm sector to the better-off.

Given this, the welfare effect of non-farm diversification largely depends on supply-side availability and dynamics of RNFSs, and household capacity to participate and take advantages of non-farm opportunities. Non-farm diversification is more welfare-enhancing when it occurs in a dynamic rural economic base, with improving infrastructure conditions, and/or when households have certain capacity (i.e. human capital, lands and other assets) to undertake investment into such opportunities (Pham et al, 2007). Therefore, the effect of non-farm diversification on household welfares depends on specific context of research and remains largely an empirical question. In this context, there have been a growing number of empirical studies on this issue.

In Japan, Taiwan, and South Korea, the poorer/landless households experienced a higher percentage of income from non-farm activities, and this suggests an equalizing influence and poverty alleviation role of the RNFS (Lanjouw and Lanjouw, 2001). Ravallion and Datt (2002) find that farm yield and non-farm output are all associated with poverty reduction in different states of India. In Berdegue et al. (2001) and Lanjouw (2001), the poor are found to be engaged in 'last resort' non-farm activities, while the non-poor are active in productive non-farm activities in El Salvador and Chile, respectively. By reviewing 18 field studies, Reardon (1997) shows that the share of non-farm income in total income is twice higher in upper third households compared to lower third households. In general, the existing studies reveal either a U-shaped or a negatively-sloped relationship between non-farm income and total household income assets. Other studies that have empirically analysed the relationship between non-farm diversification and household welfare include Reardon et al. (1992), Lanjouw (1998), van de Walle and Cratty (2003), Dabalen et al. (2004), de Janvry, et al (2005) and Bezemer et al. (2005).

These studies are briefly reviewed below. Reardon et al. (1992) employ a recursive system to examine the interaction between non-farm diversification, household income, and consumption expenditures in Burkina Faso and reveal a positive impact of non-farm diversification on household income and food consumption. In the case of Ecuador, Lanjouw (1998) proposes a simple simulation that involves estimating an earnings regres-

sion over the whole population of wage-earners and using the estimates to predict the average earnings of the poor. Lanjouw found that a shift of the poor out of the traditional sector into non-agricultural activities would imply a rise in the average income. By estimating the individual earnings equation and household expenditures, de Janvry et al. (2005) examine the earnings potential in the RNFS more thoroughly by simulating a counterfactual of what the welfare outcomes (in terms of household incomes, poverty, and inequality) would be in the absence of non-farm activities. de Janvry et al (2005) then reveal that without non-farm income sources, rural poverty and income inequality would be much higher in Hubei province of China. Bezemer et al. (2005) introduce a departure from the classical regression approaches to apply a Bayesian stochastic frontier approach (though the OLS is also used) in estimating technical efficiency of households who involved in both farming and non-farm activities in Georgia. The results demonstrate that non-farm diversification has contributed to higher technical efficiency in agriculture and higher income. In the case of Vietnam, van de Walle and Cratty (2003) provide some insights on the relationship between non-farm activities and rural poverty by using a ‘common causation’ method. This involves identifying exogenous variables having the same sign in both welfare and diversification regressions. Although this study points out variables that jointly influence both living standards and non-farm diversification, it does not offer conclusive evidence on the causality. With efforts to tackle the same issue, Dabalen et al. (2004) use a semi-parametric approach, the Propensity Score Matching, to examine the welfare impact of non-farm diversification in rural Rwanda. By comparing earnings of different household groups, they generally conclude that participating in non-farm activities produces a positive impact on household welfare. Though these studies have demonstrated the potential of the RNFS in contributing to incomes of rural households, and thus rural poverty reduction, the conclusions are far from conclusive, and further empirical evidence is needed regarding the causal relationship between non-farm diversification and household welfare.

6 Empirical Evidence of Income Sources Diversification in Developing Countries

The rural economy is not based solely on agriculture but rather on a diverse array of activities and enterprises (Chapman and Tripp, 2004). Much recent thinking on this subject is based on the concept of 'livelihood diversification as a survival strategy of rural households in developing countries' (Ellis, 1999). Farming remains important but rural people are looking for diverse opportunities to increase and stabilise their incomes. The notion of livelihood diversity is based on a framework that considers the activities of the rural poor as being determined by their portfolio of assets, including social, human, financial, natural and physical capital (Berdegue and Escobar, 2002). Activities and livelihood strategies therefore reflect farmers' assets and are further influenced by the institutions that they interact with and broader economic trends such as market prices and shocks such as drought.

Farmers are renowned for adopting risk-averse strategies, such as planting a mixture of crops to cater for a range of conditions. Households can also be seen to pursue non-farm income as a way of avoiding risks from agriculture. It is important for agricultural research and extension to recognise the changing dynamic of livelihood strategies and to tailor their strategies accordingly. The impact of diversification on agriculture varies from negative effects, such as the 'withdrawal of critical labour from the family farm' to positive ones including the 'alleviation of credit constraints and a reduction in the risk of innovation' (Ellis, 1999).

The extent of rural non-farm income (RNFI) varies between countries and regions. A study of a sample of villages in Tanzania showed that 50% of household income came from crops and livestock and the remaining 50% came from non-farm sources comprising wage labour, self-employment and remittances (Chapman and Tripp, 2004). Income from non-farm sources was higher for upper income groups than for the lowest income quartile in Tanzania. In this case the poorest farmers are most reliant on agriculture and the reliance on agriculture decreases with increased diversification into non-farm income generating activities (Ellis and Mdoe,

2003). A study of 11 countries in Latin America indicates that non-farm income constitutes approximately 40% of rural incomes. In Brazil, for example, the share of RNFI in rural incomes is 39%; surprisingly, the highest levels were found in the zones where agriculture was successful, such as the coffee and sugar zones of the Southern region. In South-eastern Brazil agro-industrialisation and urbanisation have also contributed to a higher non-farm income share than the North-eastern region (Reardon et al, 2001).

The pattern of diversification and changing income levels indicates that agriculture is not a path out of poverty in many areas. In a case study of a cocoa production area in Nigeria, for example, household RNFI rose on average from 33% in the mid-80s to 57% in 1997, with the poorest households showing the strongest move towards RNFI over the period (Mustapha, 1999). Livelihood strategies are therefore likely to be influenced by relative income levels and in particular the number of options that become available to different income classes (Ellis, 1999). A study in Malawi concluded that amongst farmers faced with options to either further specialise in commercial agricultural niches or diversify into other micro-enterprise- a key factor was not to disrupt household food supply. Despite market liberalisation only 3% of smallholders grow tobacco with most continuing to grow maize, vegetables and intercrops. A mix of activities including both agriculture and micro-enterprises emerged as the preferred strategy (Orr and Orr, 2002).

In Latin America greater diversification is often seen among the wealthiest groups. This can be explained by the fact that richer households with more land and education are able to assign someone to engage in non-farm employment for a higher wage and have better access to the infrastructure needed to establish non-farm enterprises. By contrast, the poorest farmers are limited to low-productivity farming and low-pay farm labour due to limited education and land holding. Any increase in diversification amongst this income group represents a survival strategy rather than progress along a route out of poverty (Reardon et al, 2001). This has also been observed to be the case in rural Africa where, although increased diversification corresponds with greater income, those poor in

land and capital are less able to invest in non-farm activities than higher income groups (Barrett et al. 2001).

In those cases where the poor migrate to find work and supplement their income, they leave their own farms untended. This type of diversification can include work on others' farms or non-farm activities and can result in a decline in the management of the home farm if the necessary labour is no longer available at peak times. In the 70's and 80s this occurred in Southern Africa when migration to urban jobs in South Africa left many home farms with less labour for land preparation and harvesting (Ellis, 1999). Farmers with small land holdings have also resorted to renting or selling their land to larger-scale farmers in a move towards agricultural wage labour and other non-farm activities (Bryceson, 2000). These types of 'coping strategies' can lead to downward spirals of income and deeper poverty. In Malawi the common practice of Ganyu labour mostly involves short-term work such as weeding on others' smallholdings. Although an important source of additional income, the wage rates are low and work on the home farm may be neglected at times of more severe food insecurity (Whiteside, 2000). The difference between diversification leading to sustainable coping strategies and those resulting in decreasing food security due to neglect of the home farm needs to be recognised by agricultural researchers and extensionists.

A further aspect of a shift of labour away from the home farm is the gender division of labour. Frequently migratory labour opportunities are pursued by the men in a household leaving women to tend to the home farm. This can result in a feminisation of smallholder agriculture as women take on a wider range of tasks in order to maintain the food production for household subsistence. This is particularly the case where labour opportunities require the men to migrate further away and for longer periods of time. However, diversification opportunities that can be exploited by women for additional income earning can lead both to empowerment and improvements in family welfare as women are more likely to invest additional income in children and the family (Ellis, 1999).

It is not clear to what extent income generated by non-farm activities is reinvested in agricultural production. It is generally believed that income surpluses generated off-farm can provide farmers with the security that enables greater on-farm innovation. However, this depends on whether farmers have diversified out of agriculture due a lack of opportunities for on-farm innovation or they are exploiting a particularly high demand for their labour off-farm. Reinvestment in agriculture may also be more likely to occur when off-farm work is only short term and the home farm has not been neglected. It is likely that only wealthier farmers can reinvest significantly in more specialised and commercial agriculture. It is important for agricultural research and extension to consider whether stronger linkages between off-farm income and investment in agriculture can be encouraged. Such investment could also have positive environmental impact by channelling investment into the natural resource base such as tree planting and drainage works for improved soil and water conservation.

The extent to which farm households are able to feed themselves often depends on non-farm income as well as their own agricultural production. Non-farm income is used by many households to purchase grain and the concept of 'subsistence' farmers needs to be understood in this context of diversified income sources. A survey in Kenya, for instance, showed that 61% of maize-growing households were net buyers of maize (Jayne et al., 1999). The image of the self-provisioning peasant farmer, occasionally selling surplus in the market, needs to be revised. Deficit grain-producing households may be more interested in lower food prices than in investments to increase production. The priorities that farm households place on new technology will vary according to their food security status.

Table 1 presents survey evidence concerning the shares of rural non-farm income in total incomes. The table shows that on average, (local) rural non-farm income constitutes roughly 47% of household incomes in all the three regions (43% for Africa and Latin America and 51% for Asia)².

² This is higher than the World Bank (2000) estimate what is implying that non farm income is increasing in importance in developing countries.

In China, for instance, in 1981 only 15% of rural households worked off-farm compared to 32% in 1995 (de Brauw et al, 2004). In Bangladesh, 42% of rural incomes came from rural non-farm income RNFI in 1987, and by 2000, the share was 54% (Hossain, 2004). Clearly, integrated farm-non-farm households are common sight across the developing world and the trend is steep. The average composition of incomes of course hides the distribution over households of RNFI. The range is generally around 45% of households undertaking both farming and RNF activities, but a number of studies are showing even higher participation, such as in Kenya where the share is 90% (Barrett, 2004). In China, for example, 65% of households operate in both the farm and non-farm sectors (Knight and Song, 2003), while only one-third of individuals are involved in specialization. One would expect the frequency of pluractivity to be inversely related to the average income level of the zone. In poor areas, where households typically operate both farm and non-farm activities, they may not do either very efficiently but they are able to 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 non-farm 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 pluractivity. On regional basis, African households in general typically exhibit higher rates of pluractivity, whereas in the wealthier Latin American countries household specialization is more common. In part, the sharp seasonality in rain-fed 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 non-farm calendars are typically counter-cyclical. 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).

Table 1: Contribution of Non-farm Income to Household Income in Developing Countries

Country	NF Share of Total Income	Composition of NF Earnings (% of total income)		Ratio of Local NF to Migratory Income
	A (%)	B (%) Local	C (in) Migration	B/C
<i>Africa</i>				
Botswana	65.5	20	45.5	0.44
Burkina Faso	38.5	36.5	2	25.00
Kenya	59.3	40.3	17.7	2.40
Malawi	34	26	9	3.00
Mali	6	5	1	5.00
Mozambique	15	14	1	25.00
Namibia	74.5	26.5	48.5	1.10
Niger	48.5	35.5	12	4.75
Senegal	41.7	37.7	4	11.7
South Africa	75	25	50	0.50
Sudan	38	30	8	3.50
Tanzania	27	24	3	8.67
Zimbabwe	34.5	21.5	13	17.5
Africa(average)	43	28	15	1.9
Africa average excluding Botswana, Namibia and South Africa	36	29	7	4.1

Latin America

Brazil	39	37	2	20
Colombia	50	48	2	20
Ecuador	41	39	2	20
Mexico	43	36	7	5.50
Nicaragua	42	37	5	7.00
Latin America (average)	43	40	3	14.5

Asia

Bangladesh	54	54	-	-
China	30	-	-	-
India	37	35	2	17
Nepal	39	36	2	16.2
Pakistan	67	67	-	-
Philippines	77	61	16	3.8
Sri Lanka	71	34	6	6.1
Vietnam	40	34	5	6.3
Asia (average)	51	40	10	7.1

Source: Computed from Reardon et al, 2006

Contrary to conventional wisdom, RNFI typically far exceeds farm wage-labour income. 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 labour, available empirical evidence suggests that rural non-farm income typically greatly exceeds the value of farm wage earnings. A series of several dozen household case studies indicates that rural non-farm 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 et al, 2001), and in In-

dia, 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 sense, is true of the poorest stratum everywhere; for example, in India, while the ratio is 4.5:1 for the average household (non-farm to agricultural wage income), that ratio for the poor is only 0.751 (Lanjouw and Shariff, 2002). Farm wage labour has the lowest entry barriers, and the lowest returns, of all activities.

Available evidence contradicts the traditional assumption that earnings from labour migration exceed that of local non-farm activities. RNFI far exceeds migration incomes as indicated in Table 1. The average ratio of local non-farm to migratory income in Africa is 4.1 excluding Botswana, Namibia and South Africa, if they are included the ratio is 1.9. In Latin America, even in areas of heavy out-migration, such as Mexico and Central America, local non-farm earnings normally exceed those of migrant remittances. A study of households in Mexico, for example, shows that only 7% of incomes come from migration compared to 38% from local non-farm earnings (de Janvry and Sadoulet, 2001). Five studies from Latin America suggest that local non-farm earnings exceed those earned by migrant family members by a ratio of over 10 to 1 (Reardon et al, 2006). 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 do work in domestic urban locations while only 1 household member migrates to international destinations. Similarly in Africa, a set of over 25 case studies suggests that local non-farm earnings exceeded the value of migrant income by roughly a factor of two (Reardon et al, 2006). In resource-poor rural zones, however, remittances become more important than in dynamic rural regions. Comparison of favourable and unfavourable rural zones in Burkina Faso,

Namibia and Niger suggest that the share of migrant earnings in total income roughly triple in importance in poor regions. In areas of extreme rural poverty, such as the former South African homelands and the desert areas of Namibia and Botswana, migratory labour becomes very important, accounting for half of rural incomes. These areas appear exceptional, however. Even in Northern Burkina Faso during the serious drought of 1984, average migration remittances totalled only one-tenth the value of local non-farm incomes (Reardon et al, 1998). 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 et al, 1998). Though clearly important for some rural households, migrant earnings are highly variable (de Haan and Rogaly, 2002). On average, they appear to be significantly less important than local rural non-farm earnings. Also in Asia, local non-farm 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 non-farm 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 non-farm 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 Ecuador.

Despite widespread self-employment, particularly among family-based, one and two-person enterprises, non-farm wage employment appears at

least as large a contributor to rural non-farm income. Over regions, the importance of wage income (versus self-employment income) tends to be correlated with higher incomes and denser infrastructure. In Latin America, non-farm wage earnings (as a level, not a rate) commonly exceed the value of self-employment earnings. In Brazil, Chile, Colombia, in Mexico and in Nicaragua, the share of non-farm 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 non-farm 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 favourable zone compared to the less. Ruben and van den Berg (2001) and Isgut (2004) show that non-farm 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 non-farm 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 non-farm 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 non-farm wage income from casual non-farm labour, versus three-quarters for the poor quartile – indicating that the uneducated poor households relied on low skill, low entry barrier labour.

7 Empirical Evidence of Income Sources Diversification in Edo State

The empirical evidence for this study was obtained from Edo State in Nigeria (see Map 1). Edo State was created on August 27th 1992, following the division of Nigeria into 36 States. The State is bounded on the East by Kogi and Anambra States, on the West by Ondo State, on the North by Kwara State and on the South, by Delta State. It occupies an area of 19,281.93 square kilometres. It has two distinct seasons, rainy season and dry season. The annual rainfall is 250cm in the coastal areas and 150cm in the extreme North. It has 18 Local Government Areas and 3 Agricultural zones, which are Edo North, Edo Central and Edo South. It has a population of 3,218,332 people made up of 1,640,461 males and 1,577,871 females by the 2006 population census. The major occupation of the people is farming and fishing. They grow arable crops such as yams, cassava, plantains, cocoyams, and cash crops such as pineapples, oil palm, cocoa, rubber and lumbering.

The issue of income diversification is important to the people of Edo State, because majority of them are farmers and fishers. Although the state is one of Niger-Delta in Nigeria and produces about 1% of Nigerian oil, the economic benefits of this did not get down to the majority of the people as they remain poor. Table 2 indicates that, while 24% of the people in Nigeria are in core poverty, 41% of the people in Edo state are in core poverty. This is coupled with higher cost of living and urban poverty than the national average. The people are also hampered by credit constraint as only 8.3% of them have access to credit facilities. The lower accessibility to infrastructure is indicated in lower accessibility to pipe borne water. With this type of scenario, people have to struggle by themselves to improve their welfare, in the absence of governments support. This make income sources diversification relevant to them. The survey was well stratified and was processed with the assistance of World Bank; hence they are expected to be of high quality. Data related to income, income sources, education, location and gender in Edo state were extracted from CD-ROM that was obtained from the Nigeria Bureau of Statistics

(NBS) Living Standard Survey conducted in 2004. These relevant data were analysed using percentage distribution, analysis of variance (ANOVA) and regression analysis.

Table 2: Summary of Socio-economic Information on Edo State and Nigeria

Socio-economic Information	Edo State	National Average
Core poor (%)	41	24
Per capita expenditure (composite) (₦)	40,402	39,155
Urban unemployment (%)	24.0	14.2
Credit facilities (%)	8.3	10.7
Enrolment in primary school (number)	244,414	566,265
Enrolment in secondary school (Number)	129,254	146,557
Primary school pupil-teacher ratio (number)	27.36	40.00
Secondary school pupil-teacher ratio (number)	54.20	32.10
Average cost of education (₦)	35,124.33	16,646.69
Percentage of people who attended public health institutions (%)	58.57	71.29
Average hospital fees (₦)	6,928.51	3,017.04
*Primary, secondary and tertiary health facilities (number)	292	395
Primary health centres (number)	254	370
Pipe-borne water (%)	9.7	13.6
Personal computer (%)	1.1	1.3

Source: Computed from Core Welfare Indicator Questionnaire Survey, 2006

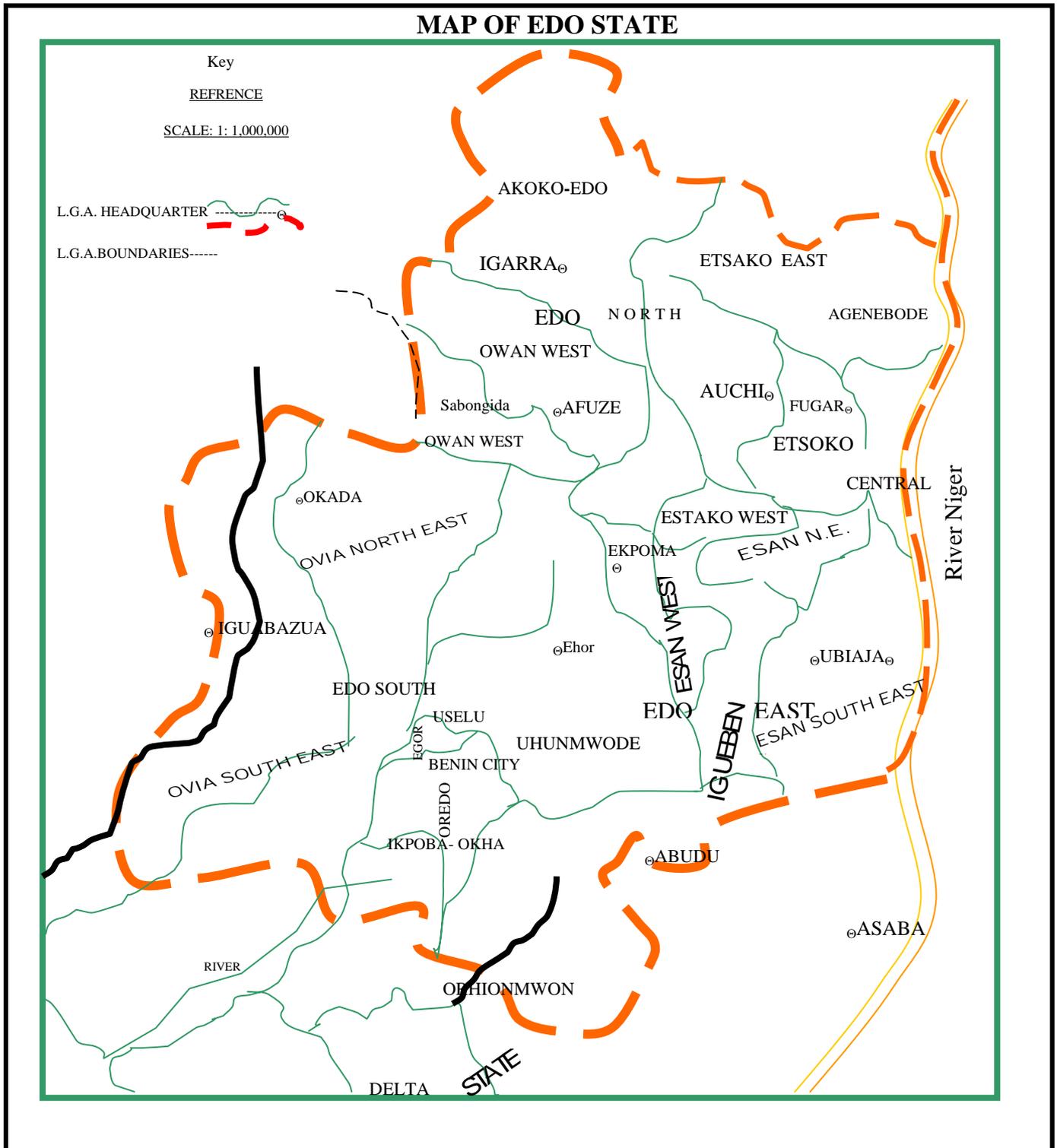
The data for this empirical study were obtained from the National Integrated Survey of Household (NISH) by the National Bureau of Statistics. The survey conducted in 2004 was used, being the most recent in Nigeria. Rural and urban households' data from Edo State in the survey was extracted for this study. The survey is disaggregated on the basis of location (rural and urban). The respondents in the urban area of Edo State in the survey constitute 1,422 and that of rural area constitutes 887.

The first empirical evidence shows that the major sources of income for people in Edo state are wages & salary (33%), rent (33%), sales of farm produce (14%) and trading (7%) as indicated in Table 3. This structure varies slightly from urban area to rural area. While about 37% of the people in urban area got their income from wages and salary, about 31% of the people in urban area got their income from wages and salary. About 21% of the people in the rural area got their income from sales of farm produce; only 4% of the people in the urban area got their income from sales of farm produce. More people in urban area got their income from trading and remittance, than people in rural area, while 11% and 2% of the people in urban area got their income from trading and remittance respectively, the respective values for rural areas are 5% and 0.6% respectively. Generally, wages and salary are the major source of income for people of Edo state. This finding is in consonance with Barrett et al (2001). They find that non-farm income stochastically dominate those entirely based on agriculture in Sub-Sahara Africa. Therefore, since people need skill and education to participate in wage and salary employment, empowering these people through acquisition of requisite education will enhance their ability to participate in paid employment.

The evidence from Edo state on effect of education on income also indicates that there are significant differences in the income of the people according to their educational level. Table 4 shows that the junior secondary school certificate holders have the lowest income ₦1,423 (\$12) per month and First Degree certificate holders have the highest income ₦51,0471 (\$4,254) per month in Edo state. The difference is significant at 1% level of significance when tested with analysis of variance. This fact has also

been corroborated by Barrett (1997), that educational attainment increases income and income diversification in Africa. Likewise, ODI (2003) opines that removal of educational constraints will remove limits to income earning and income diversification abilities in Sub-Saharan Africa. According to Gordon and Catherine (2001), there are several processes that reinforce the effect of education on incomes. Education increases skill levels, which are required for some rural non-farm (RNF) activities, or contribute to increased productivity, or may be an employment rationing device. Better-educated members of rural populations have better access to any non-farm employment on offer, and are also more likely to establish their own non-farm businesses Reardon (1997). Reardon et al. (1998) indicate that education is one of the first major investments of farmers in cash-cropping zones, illustrating the point with evidence from cotton-growing areas in Mali following the 1994 devaluation of the CFA franc. Islam (1997) argues that primary education enhances the productivity of the workforce, whilst secondary education stimulates entrepreneurial activity.

Figure 1: Map of Edo State, Nigeria



Source: Omofonmwan and Kadiri (2007)

Table 3: Distribution of the Respondents according to Income Sources

Income Source	Urban		Rural		Edo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Wages and salary	240	36.9	330	30.9	570	33.2
Rent	218	33.4	353	33.1	571	33.2
Overtime work	4	0.6	15	1.4	19	1.1
Bonuses / Gifts	36	5.5	48	4.5	84	4.9
Loans	13	2.0	15	1.4	28	1.6
Sales of produce	23	3.5	219	20.5	242	14.1
Profit from trading	73	11.2	49	4.6	122	7.1
Fees from pool betting ³	16	2.5	14	1.3	30	1.7
Sales of property	2	0.3	2	0.2	4	0.2
Bride price received	0	0.0	3	0.3	3	0.2
Remittances	11	1.7	6	0.6	17	1.0
Pension / Gratuity	9	1.4	4	0.4	13	0.8
Others	6	0.9	9	0.9	15	0.9
Total	651	100.0	1067	100.0	1718	100.0

Source: Computed from NBS data 2004.

³ Money received from Casino

Table 4: Distribution of Income of the Respondents according to Educational Level

EDUCATIONAL LEVEL	URBAN		RURAL		EDO	
	Amount	Percent	Amount	Percent	Amount	Percent
Primary	20,398.59	10.55	19,549.56	29.40	19,884.70	14.12
Junior Secondary	23,262.86	12.04	9,320.65	14.01	14,222.55	1.01
Senior Secondary	32,160.59	16.64	13,037.03	19.60	19,671.74	13.97
First Degree	68,677.78	35.53	24,600.00	36.99	51,046.67	36.26
Higher Degree	48,771.00	25.24	0	0	48,771.00	34.64
Total	193,270.8	100.00	66,507.2	100.0	140,796.7	100.0

F= 13.373*

*Sig. = 1% level

Source: Computed from NBS data , 2004.

Information on income sources indicated that 54% of people got there income from a single source, while about 46% of the people in Edo state derived their income from more than one source as indicated in Table 5. This suggests that 46% of the people diversified their income base. This finding support the fact that sizeable proportion of the people rely on more than just one income source in Edo State as it has been documented by Ellis (1998). The estimated 46% of the people that diversified their income portfolio is within the range of 40-50% estimated for Africa by Little et al (2001). This is also within the range of 30-50% estimated for Sub-Sahara Africa by Reardon (1997).

However, 46% estimated here is higher than 43% estimated for Latin America by Reardon et al (2006), while is lower than 50% estimated or Tanzania (Chapman and Tripp, 2004). All these support the fact that the rural economy is not based solely on agriculture but rather on a diverse array of activities and enterprises as noted by Chapman and Tripp (2004). The fact that 46% of the people in Edo state diversified their income base

implies that in designing poverty alleviation programmes, efforts should be made to consider this diversified portfolio in assisting them.

Table 5 also indicates that the average incomes of the people increase with increases in number of income sources (excluding people that has only one income source). Generally, five income sources give the maximum mean income of N29,627 (\$247) compared with only income source with mean income of N16,361 (\$136) per month.

Although Brown et al (2006) said that modelling income diversification strategies is difficult; we attempted to use regression analysis to test the influence of income sources diversification on income in Edo state. The result is presented in Table 6. Exponential function is selected as lead equation judging from the size of adjusted R square, significance of F-value and signs of the coefficients. The table shows that the exponential functional form has F-value of 21.63, which is significant at 5%. This indicates that the exponential equation represents the income equation well. The adjusted R square of 0.19 suggests that number of income sources, education, gender and location explain 19% change in income of the people in Edo State. The lower adjusted R square is not a critical problem when using cross sectional data as canvassed by Aaron et al (1987) in his *Econometrics-Basics and Applied* book, on page 94. Hodge (1978) estimated adjusted R square of 18%. However, the lower value of adjusted R square implies that there some other variables that affect income of the respondents that are not captured in the model. Some of these variables may be subjective such as corrupt enrichment and other are omitted variables that are not included in the survey. Some of these are access to credit, access to market, infrastructure, transportation and age (DAC, 2004). However, since the F value is significant, and some of the variables are also significant, the equation can be used to explain the effect of income sources, education, location and gender on income of the respondents.

The equation shows that the number of income sources has positive and significant relationship with income, suggesting that as the number of income sources increases the income of the people will also increase. Education has positive and significant relationship with income, meaning that income of the people can be influenced by increasing their educational level. Location also has positive and significant relationship with income; this means that urban dwellers have more income than rural dwellers.

The deduction from the equation is that any effort aimed at increasing income diversification of these people will increase their income. Pham et al (2007) supported the fact the income source diversification is more welfare-enhancing when it occurs in a dynamic rural economic base, with improving infrastructure conditions, and/or when households have certain capacity (i.e. human capital, lands and other assets) to undertake investment into such opportunities. Improvement in educational attainment will not only increase the income of these people but will also enable them to participate in market economy.

Table 5: Income and Income Sources Diversification in Edo State

Number of Incomes Sources	Mean Income	Frequency	Percentage of the People with the Income Sources
1	16,360.99	251	53.63
2	11,052.45	53	11.32
3	16,957.11	45	9.62
4	20,477.6	25	5.34
5	29,626.55	29	6.20
6	21,537.63	19	4.06
7	17,024.24	46	9.83
Total	133,036.57	468	100.00

Source: Computed from NBS data, 2004

Location effect noticed in the equation is due to the fact that there more

income lucrative earning opportunities in urban area. This is in agreement with Tacoli (2004).

Urbanization has been an important driver of diversification in recent years, offering many new opportunities; the flow of money, goods and services between rural and urban area can create a virtuous circle of local economic development by increasing demand for local agricultural produce, stimulating the non-farm economy and absorbing surplus labour (Tacoli, 2004).

But according to DAC (2004), this is crucially dependent on three prerequisites; access to infrastructure, trade relations , and market information. Tacoli (2004) said that access to urban area will offer lucrative opportunities to the people and stimulate economy by absorbing surplus labour. The non-significance of gender implies that if women are given the equal opportunity with men, they will perform creditably well as men in their income earning activities. Women also tend to engage in businesses that require lower start-up capital than those in which men become involved. Islam (1997) has demonstrated that women's involvement in income-earning opportunities has greater significance than simply increasing their own or household income. She states that it strengthens their decision-making power within the household; helps limit family size, and improves child nutrition and education. Bryceson (1999), using evidence from seven country studies in Africa, goes further to concluding that gender barriers to income earning opportunities are declining rapidly.

Table 6: Effect of Income Sources, Education, Gender and Location on Household Income in Edo State

Variable	Coefficient	t-ratio
Constant	7.57	41.75**
Income source diversification	0.22	6.83**
Education level	0.05	3.76**
Gender	-0.04	-0.30
Location	0.73	4.84**
F	21.63**	
\bar{R}^2	0.19	
D.W	1.48	

**Sig. = 5% level

Source: Computed from NBS data 2004.

8 Conclusion and Recommendations

The rural economy is not based solely on agriculture but rather on a diverse array of activities and enterprises. Farming remains important but rural people are looking for diverse opportunities to increase and stabilise their incomes. The notion of livelihood diversity is based on a framework that considers the activities of the rural poor as being determined by their portfolio of assets, including social, human, financial, natural and physical capital. Households can also be seen to pursue non-farm income as a way of avoiding risks from agriculture. This income diversification varies between countries and regions. This study reviews the cases of developing countries. It shows that non-farm income as share of total income in Africa and Latin America is 43%. The empirical evidence from Edo state in Nigeria indicates that 46% of the people have a well diversified portfolio. The evidence from Edo state shows that the major sources of income in Edo state are wages & salary (33%), rent (33%), sales of farm produce

(14%) and trading (7%). It also indicates that income increases with level of education, with Junior Secondary school education being the lowest and first degree being the highest. The empirical evidence indicates generally that income increases with the increase in number of income sources and five income sources being the optimum that gives the highest mean income. The regression analysis indicates that income sources, education and location are positive and significant determinants of income, while gender has non-significant relationship with income in Edo state. This suggests that increase in opportunity for people to diversify their income base will increase their household income. Improvement in education will not only increase the ability of the people to participate in market economy and have access to wages and salary but will also equip them with skills to diversify. The significance of location implies that urban dwellers have more income than rural dwellers in Edo state, because there were more income-earning opportunities in urban areas than in rural areas. The non-significance of gender implies that if women are given the equal opportunity with men, they will perform creditably well as men in their income yielding activities. In improving income and livelihood in Edo state, people should be equipped with needed skills and education to participate in wage and salary employment and possibly migrate to seek for job. The fact that 46% of the people in Edo state diversified their income base implies that, in designing poverty alleviation programmes, efforts should be made to consider this diversified portfolio in assisting them. Approaches towards specialisation and commercial agricultural development need to be balanced by those that encourage investment in small-scale and part-time production to maximise the use of household income generation for longer term rural development strategies. Improving rural infrastructure and implementing universal basic education are critical to build up the capacity of households (in particular poor households) to participate in non-farm activity. Strengthening the linkages between farm activity and non-farm activity is essential to optimize the contribution of non-farm activity to pro-poor rural economic development.

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