Livelihood Strategies in Rural South Africa: Implications for Poverty Reduction

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Abstract

This paper has the objective of identifying dominant livelihood strategies in rural South Africa. It differs from previous studies done for South Africa in that it analyses a recent large household survey; classifies livelihood strategies into four broad and eight specific livelihood strategy groups and matches them with welfare strata of rural households; and analyzes socio-economic constraints poor households face to enter into high return livelihood strategies. Two approaches are applied to achieve these objectives -stochastic dominance test & and multinomial logistic regression. It finds that households that generate income from wage employment in non-farm and farm activities are better off than other households. Analysis of the socio-economic characteristics of rural households also reveals that age, labour endowment, education, and community characteristics in terms of access to basic infrastructure are some of the barriers that poor households in rural areas face to enter into high-return livelihood strategies.

1. Introduction

Many of the poverty related studies in South Africa have focused on its spatial distribution in the nine provinces and rural versus urban shares, and inter- and intra-racial comparisons. We came across small number of studies that stratified rural households in South Africa into welfare classes on the basis of livelihood strategies or activities they pursued (see Perret, Anseeuw, and Mathebula, 2005; Anseeuw, Laurent, Modisella, Carsten, and Van Der Poll 2001; Carter and May, 1999; and Leibbrandt, Woolard, and Woolard, 2000). This is in sharp contrast with the many studies available for many developing countries.

The study by Perret, et al., (2005) and Anseeuw, et al., (2001) were conducted in smaller rural areas of South Africa - Makgato and Sekgopo areas in the Limpopo Province and Leliefontein in the Northern Cape Province. The studies by Carter and May (1999) and Leibbrandt, et al., (2000) focused at the national level but had different objectives. They, using the 1993 Living Standards Survey, disaggregated the rural population into discrete livelihood classes. Carter and May (1999) found that poor and non-poor households derive their livelihoods from distinct activities. For example, their studies showed that wage income earners are relatively non-poor than those that depend on agriculture as their important source of income. On the other hand, the work by Leibbrandt, *et al*., (2000) gave interesting insight into the contribution of various livelihood strategies to households' overall income. In addition, the study reveals the role these strategies played as key sources of inter-household income inequality and poverty in rural areas. They found wage income as the most important income component and also the most important source of inequality in the rural areas of South Africa.

We take cognisance of the contributions that these past studies have made. Hence we attempt to add to existing body of knowledge. First, we check if similar conclusions (especially the relationship between welfare and livelihood strategies) could be reached using more recent data (the 2009 General Household Survey). Since the transition to democracy some 15 years ago, the government has addressed myriad of constraints in the political, economic, and social spheres. This has opened up opportunities for some households to venture into newer strategies by broadening the portfolio of activities available to them. Second, past studies classified livelihood strategies very broadly. In this study, the classification is influenced by the question the study attempts to address; this necessitates reclassifying some of the broadly classified sources of income exclusively into only farm, only non-farm, mixture of farm and non-farm and non-labor sources of income. Third, as opposed to Carter and May (1999), we don't use a poverty line to calculate the dominance of one livelihood strategy over the other. Instead, ordinal ranking of livelihood strategies is made using first-order stochastic dominance test. Fourth, this study unlike earlier studies analyses factors that constrain poor households' access to high return livelihood strategies.

To achieve our objectives, the paper follows three steps. In step one, we study major sources of income in rural areas. In step two, we identify dominant livelihood strategies by matching livelihood strategies with welfare strata of households, defined in this study in terms of adult equivalent per capita consumption expenditure. Finally, we analyse livelihood strategies in conjunction with important socio-economic characteristics of rural households. The process will give some insight into the barriers that limit poor households' entry into high-return livelihood strategies. This will identify superior livelihood strategies that policy makers and development practitioners could target to make meaningful difference in the lives of poor households in rural areas.

The remainder of this paper is organised as follows. In section two, we review the literature under four sub-sections. Here we review available approaches used to pinpoint major livelihood strategies in rural areas, the link between livelihood strategies and welfare, and finally methods commonly applied in the literature to identify dominant livelihood strategies. In section three, we summarise the evolution of development strategies in South Africa, with particular reference to rural development. This is followed by section four, which deals with the data, variables, and methods. Section five will focus on results and discussion. Finally, section six concludes the study.

2. Literature Review

Rural areas are the economic backbone of most developing countries. Depending on a country's level of advancement in the economic sphere, they contribute to overall economic growth by creating jobs, supplying labour, food, and raw materials to other growing sectors of the economy; and helping to generate foreign exchange. Despite these significant contributions, however, rural areas are the most marginalised. They are characterised by poverty, food insecurity, unemployment, inequality, lack of important socioeconomic services, etc.

The questions central to any rural development intervention strategy revolve around – Who the poor in rural areas are? What constitutes the dominant sources of their livelihood strategies? Why are poor households in rural areas stuck with low income earning opportunities? What policy propositions (interventions) are there that could be pursued to alleviate rural poverty?

The burgeoning literature on the subject applies different approaches to answer these questions. Overall, results suggest that understanding the socio-economic fabric of households in rural areas is key. This entails – studying livelihood strategies pursued by rural households; classifying households into various welfare strata; establishing pattern(s), if any, between livelihood strategies pursued by households and their welfare stratum, and identifying entry barriers, if any, that poor households face to enter into high-income activities.

2.1. Identifying and classifying livelihood strategies in rural areas

Rural areas are characterised by the presence of diverse economic activities. Some are farm related and others not. Research has shown that non-farm activities are growing in importance (cited in Barrett, *et al.*, 2001). According to Bryceson and Jamal (1997), Reardon (1997) and Little *et al.* (2001), in Africa, non-farm sources account for 40-45 % of average household income.

Ellis (1998) defines livelihood diversification as 'the process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival and in order to improve their standards of living'. Households diversify for various reasons. The literature aggregates the reasons under different categories. For example, for Ellis (1998), diversification occurs due to households' pursuit of voluntary and involuntary strategies; for Von Brown (1989) it is due to *ex ante* risk minimisation and *ex post* coping strategies; for Barrett *et al.* (2001) due to push and pull factors, etc. Aside from the semantics, similar reasons are given. In this study we use terminology in a manner that blends that in the existing body of knowledge. We classify the reasons for diversification into involuntary or deliberate, *ex ante* and *ex post*

strategies. The former refers to coping strategies that households are forced to adopt in reaction to disasters of some sort (Ellis, 1998; Ellis, 2000).

Deliberate *ex ante* income diversification strategies could be regarded as safety valves. They refer to push factors such as minimisation of risks, liquidity constraints, labour, land, high transaction costs, and seasonality. Households try to stabilise their income by diversifying into income sources that are less susceptible to climatic and price variations. In addition, lack of sufficient access to important farm requisites could force households to look for additional or alternative sources of income.

Households could also embark on deliberate *ex post* income diversification strategies. These constitute activities that could be strategically allied to or are complementary to their primary source of income. Examples of this include integration of crop and livestock activities. Other examples of deliberate *ex post* income diversification strategies include realisation that they have comparative advantage in non-farm activities as demonstrated by high premiums; location advantage due to their proximity to commercial agriculture and urban areas with the potential to create off-farm and non-farm employment opportunities; and in response to diminishing returns on factors of production (Abdulai & CroleRess, 2001; Corral & Readon, 2001).

There is consensus in the literature regarding the broad classification of livelihood strategies on the basis of farm (livestock and crop production), off-farm (wage employment in other farms), and non-farm (non-agricultural income sources such as wage employment, self employment, property income, and remittances). For more on these see Ellis (1998) and Barrett *et al*. (2001). The classification is flexible. It groups all similar activities under one name. It is consistently applied in the literature but with one exception. See Dercon (1998), De Janvry & Sadoulet (2001) and Deininger & Olinto (2001) for some variations in the way terminology is used. For example, 'off-farm' is used in the context of 'non-farm'. Activities that could be classified under the non-farm category are diverse. We came across no study that claims to have produced an exhaustive list of them.

2.2. Livelihood strategies versus welfare

So far, we have reviewed what the literature says about the type of livelihood strategies commonly practiced in rural areas. Next, we document from the literature, how the rural poor can be classified into different welfare groups on the basis of the livelihood strategies they pursue. In other words, we seek answers to the question we raised at the beginning – which livelihood strategies give superior outcomes in welfare terms? Conversely, which livelihood strategies are commonly practiced by poor households?

Different approaches have dominated the literature. The approach by Brown *et al*. (2006), termed an asset-based approach, promotes application of a statistical techniques to cluster households on the basis of livelihood strategies and uses the resulting strategy-specific income distributions to test differences in welfare among identified livelihood strategies.

The second approach classifies households on the basis of some measure of welfare in quartiles or terciles – either income or consumption expenditure of households is used. Thereafter, dominant activities performed by households in each welfare group are identified. This approach is applied by the majority of studies (Stifel, 2010; Barrett *et al*., 2005). It differs from the asset-based approach in that activities are predefined. Therefore, what is important here is identification of activities/livelihood strategies performed commonly by households that fall within similar welfare groups.

The third is somewhat similar to the asset-based approach. But instead of relying on available data, households' labour allocation decisions and the push and pull factors that underline their decisions to take up a livelihood strategy are considered. The approach is proposed by Stifel (2010).

The fourth approach blends all the above approaches. It proposes identifying a livelihood strategy and attaching a welfare outcome to it, assuming a unidirectional functional relationship among assets, livelihood strategies, and welfare. See Barrett *et al*., (2001). The approach proposes a flow of causal relationships running from assets to activities (portfolio choice) and then to outcomes. The flow is based on the assumption that the

type of assets that households are able to command determines the type of activities they take up or engage in, which in turn determines their welfare status within a society.

On the basis of the application of the above approaches, studies have found positive relationships between households' welfare and their involvement in non-farm activities. For general discussions on this see Barrett *et al.*, 2001. For studies on African countries see Stifel (2010), Lanjouw, Quizon & Sparrow (2001), Smith, Gordon, Meadows & Zwick (2001), Abdulai & CroleRees (2001), and Canagarajah, Newman, and Bhattamishra (2001). For studies outside Africa see Da Silva & Del Grossi (2001), Corral & Reardon (2001); De Janvry & Sadoulet (2001), Reardon & Escobar (2001), Elbers & Lanjouw (2001), and Lanjouw (2001).

These studies have found that rural households with the potential to diversify their income sources into non-farm activities are relatively better off than those that depend on farm activities (off-farm and farm) alone or take up non-farm activities as their less important sources of livelihood. The finding has policy implications in that it promotes support to non-farm activities to address poverty in rural areas.

Despite positive relationships between non-farm activities and welfare, studies have found that not many households have benefited from non-farm activities in developing countries (Stifel, 2010; Brown, *et al.*, 2006; Woldehanna & Oskam, 2001; and Abdulai & CroleRees, 2001). Available literature justifies the rationality behind this seemingly poor choice that poor households make. At first sight, the choice seems to contradict the well known theory of comparative advantage. The theory postulates that households' take up activities (strategies) that give superior returns.

The literature argues in support of the conventional wisdom that households allocate asset endowments in a manner that equates marginal returns across activities accessible to them. Poor households are forced to stick to low-return activities because of entry barriers they face to high-return strategies. According to Brown *et al.* (2006), in the presence of both high- and low-income strategies, households adopt the latter only when there are barriers to adopting the former.

The literature has identified a number of entry barriers to superior livelihood strategies in the developing countries. Broadly, these include access to formal credit; access to market such as distance, and information; demographics of household heads such as education attainment, age, experience, and gender; and households' asset endowments such as land, labour, and financial capital. For details on these see Stifel (2010), Brown (2006), Barrett *et al.*, (2001), Abdulai & CroleRees (2001), Woldehana and Oskam (2001), Smith *et al.*, (2001) Dercon (1998), Barrett (1997).

In summary, available studies acknowledge the presence of a positive relationship between non-farm livelihood strategies and welfare. They suggest that through targeted interventions that prioritise non-farm activities, meaningful change in the lives of the poor in rural areas can be achieved. This triggers questions like – why has the non-farm economy been neglected in the rural development policy discourse? We dwell on this at some length in the next section.

2.3. Review of approaches to measure superior livelihood strategies

In this section, we provide the types of approaches that are available to the researcher wanting to analyse livelihood strategies in rural areas.

The studies reviewed used either per capita household consumption expenditure or per capita household income as a proxy for welfare. Thereafter, households were assigned to predefined welfare groups (in quintiles or terciles). The use of consumption expenditure is preferred to household income for three reasons. Firstly, households tend not to disclose their income for various reasons. Secondly, not much of the income earned might be utilised to enhance the welfare of individual household members. Third, income is susceptible to fluctuations for various reasons. Therefore, it has a tendency to misrepresent households' welfare. Households' income could fall but they could still maintain their welfare level by selling assets.

Regardless of the welfare measure used (income or consumption expenditure), available literature recommends that per capita consumption/income calculations should take into account intra-household variations in members' access to households' resources. Variations in access could result from differences in

the age and gender composition of households. In addition, it is recommended that the calculation takes into account economies of scale in consumption that accrues to households with large families. The larger the family, the lower will be per unit cost of, say, consumption.

The literature recommends the use of an Adult Equivalence Scale (AES). The scale should be designed in such a way that it allows room for consideration of both intra-household variation in consumption expenditure and economies of scale.

After households are classified on the basis of their welfare status and the dominant livelihood strategies that are associated with each welfare groups are identified, attempts will be made to identify superior livelihood strategies. The majority of the studies reviewed did the latter through a first order Stochastic Dominance Test. The test confirms if welfare outcomes, perceived to have arisen due to apparent differences in livelihood strategy choices of households, are not due to mere chance.

If the test could attribute the gaps in welfare to differences in livelihood strategies that households pursued, the logical question that available studies asked was whether poor households' access to high-income strategies is constrained by some form of entry barrier. To statistically test this, multinomial logit or probit models were applied. A study on this is important from a policy perspective. It facilitates poor households' entry into high-return livelihood strategies, thereby contributing towards alleviation of poverty in rural areas.

3. Evolution of Development Strategies of South Africa Since 1994

South Africa has adopted different macroeconomic frameworks since the new political dispensation in 1994. These include the Reconstruction and Development Programme (RDP) in 1994, the National Growth and Development Strategy (NGDS) in 1996, the Growth Employment and Redistribution strategy (GEAR) in 1996, and recently a Medium Term Strategic Framework (MTSF). The MTSF is anchored on the basic ideals of a developmental state. The MTSF is composed of new development priorities (see Table 1 for a list of macroeconomic frameworks).

In addition to the above major macroeconomic frameworks, a number of legal and policy frameworks with direct and indirect focus on rural development were implemented. To name a few – abolition of the racially-based Land Measures Act, 108 of 1991; Restitution of Land Rights Act, 22 of 1994; Development Facilitation Act, 67 of 1995; Constitution Act, 108 of 1996; Extension of Security of Tenure Act, 62 of 1997; Transformation of Certain Rural Areas Act, 94 of 1998; Communal Land Rights Act of 2004; etc. (see Table 1).

In the paragraphs that follow, we look at rural development initiatives undertaken within the above macroeconomic frameworks.

The overarching policy objective of the RDP was to address massive shortfalls in social services on the back of a sound macroeconomic fundamental. Examples of social services include housing, clean water, electrification, healthcare, and public works. In addition, it introduced policies to correct structural problems that the country had inherited. These included continuous decline in the Gross Domestic Product (GDP), decline in per capita income, increasing levels of unemployment, and massive government debt.

The RDP also touched on some aspects of rural development. For example, it planned to address inequality and insecurity in land ownership through land reform. Inequality in land ownership patterns was to be addressed through land restitution, which aimed at returning land lost due to race-based discriminatory laws since 1913; a market-based land redistribution programme to redress imbalances in land ownership; and tenure reform to deal with inefficiencies in land use in former homelands and to protect the rights of farm workers.

In addition, an attempt was made by the rural task team of the RDP office to stimulate debate on rural development. It produced a discussion document titled *Rural Development Strategy (RDS) of the Government of National Unity*. It was published in 1997 by the Department of Land Affairs under a different title, *Rural Development Framework* (RDF) (DoLA, 1997; ISRDS, 2000). The RDF took lessons from the National Rural Development Strategy of the 1995. It emphasised a demand driven and bottom-up approach to rural development with very active involvement of local government. In addition, although it was driven initially by

the RDP objectives, which were influenced more by a welfarist line of thinking, the RDP's replacement by GEAR in 1996 necessitated a shift to a user-pays, market-based approach. The approach in essence underlined the need for cost effectiveness in rural development project finance.

The move from the RDP to the GEAR framework was based on the conviction that a higher growth trajectory would be a way forward to tackle unemployment, generate sufficient resources to expand social service delivery programmes, and drive the agenda for equitable distribution of income and wealth. In addition, the shift was motivated by the perception that questioned the sustainability of macroeconomic fundamentals. For example, the exchange rate and the balance of payments were too dependent on short-term reversible flows. Hence, it was feared that a sudden shock to capital outflow would easily trigger a crisis in the balance of payments, would instigate instability in the exchange rate, and would erode government's ability to finance its development programmes.

The GEAR and RDP have similarities as well as differences. They differed on the conceptual framework that governed their approach to achieve sustained economic growth. As opposed to the RDP, which relied on Keynesian views of economic development; GEAR was based on neo-liberal lines of thinking (trickledown theory). The latter was imposed by the Breton Wood institutions on developing countries that relied on financial assistance to run their economies. South Africa did not seek financial assistance at the time. The move was at best by self invitation, based on the analysis of trends in the macroeconomic fundamentals at the time. It was perceived that unless alternative policies were implemented, the country could be forced to seek financial assistance. It was thought that neo-liberal policies could put the economy on a higher growth trajectory that could generate enough resources to finance government programmes.

Thus, the GEAR set out with policy objectives of correcting the economic, social, and environmental costs of past policies. This required re-engineering policy planning at all levels. For example, it scrapped some policies and institutions with direct effect on rural areas. This included abolition of agricultural market boards in a bid to remove price controls, removal of subsidies on interest rates, revision of age-old roles assigned to the Land Bank, cessation of the Agricultural Credit Board (ACB) that provided credit to less creditworthy large-scale farm operators, and removal of subsidy to capital purchases.

In addition, the government committed itself to multilateral agreements as a member of the World Trade Organisation (WTO). This resulted in the termination of general export incentive schemes, adherence to sanitary and phytosanitary (SPS) measures, and gradual removal of border protection on international trade (MfALA, 1998). The changes created both opportunities and constraints. On the side of the constraints are its effects on farm income and availability of off-farm job opportunities in rural areas. The former could result from increased vulnerability of farmers to price fluctuations caused by dynamics in both the domestic and international markets. The latter could occur due to, *inter alia*, fiscal austerity measures that targeted cuts in agricultural support in general. The changes primarily affected commercial farms, which are major sources of off-farm job opportunities in rural areas.

The GEAR had plans to achieve economic growth through export diversification, expansion in private capital formation, expansion in public sector investment, expansion in employment intensity of investments, increase in infrastructure development, and increase in service delivery (DoF, 1996). GEAR succeeded in achieving macroeconomic stability and economic growth. But it was criticised heavily by the labour federation and others on the grounds that the benefits of the growth could not reach the poor. According to its opponents, it contributed to soaring unemployment and inequality. To ensure that growth would be sustainable and that its benefits would be shared by South Africans across all social classes, an initiative called Accelerated Shared Growth Initiative of South Africa (ASGI-SA) was introduced in 2005.

TABLE 1 HERE

A rural development strategy by the name Integrated Sustainable Rural Development Strategy (ISRDS) was born in 2001. It was later changed to a programme and was renamed the Integrated Sustainable Rural Development Programme (ISRDP). This was to emphasise its operational purpose (Perret, *et al*, 2005). In

general, the strategy (programme) emphasised government's commitment to address challenges of development in rural areas.

The ISRDP(S) benefited from lessons learnt from the NRDS and RDF in terms of project coordination and project selection and from the Integrated Development Plan (IDP), which gave a legal framework to the implementation of integrated projects. This made it possible for the ISRDP to be driven by local municipalities and to implement projects that are inter- and intra-sectoral. Thirteen nodal points were identified, drawn from eight provinces, with a plan to expand the coverage to the entire country. The strategy was to be financed out of reallocation of existing public funds, out of Private Public Partnerships (PPP) initiatives, from the private sector, donations, etc.

Its design was in line with the conceptual framework of GEAR. Its difference stems out of its limited appetite for the centrally-designed interventionist strategy that characterised previous similar initiatives. It promoted a decentralised approach wherein rural local governments were to play a major role in the development of their communities.

The strategy was criticised heavily. For example, it did not have a dedicated budget; it involved more than one sphere of government, requiring intra- and inter-sphere planning and budgeting, which in some instances caused competition among line departments for visibility with little effect on deliverables that speak to IDP demand-driven approaches (Perret, *et al.*, 2005); selection of some nodes was influenced by political lobbying and pressure rather than local demand (Everatt, 2001); and some nodes fell into new municipalities, which were preoccupied initially with capacity building rather than delivering on ISRDP objectives (Perret, *et al.*, 2005).

Currently, the government has adopted a new Medium Term Strategic Framework. Rural development is strategic priority number three in the framework. To this end, a new ministry (the Ministry of Rural Development and Land Reform) was created to serve as a custodian of rural development. The elevation of rural development to such a high level of government priority and its handling at ministerial level was informed by the absence of a nationally focused rural development strategy, the de-link experienced in the past between national rural development objectives and implementing authorities, and trend in poverty.

To effect rural development, a programme called the Comprehensive Rural Development Programme (CRDP) was introduced. The programme draws lessons from pilot sites. The initial pilot site was administered in Muyexe village in the greater Giyani local municipality of the Limpopo province. Additional pilot sites were selected in other provinces except the Gauteng province to help refine the programme further in the future (MoRDLR, 2009).

The CRDP is to be implemented through community engagement initiatives. It will profile communities in each pilot site by collecting information on their patterns in resource use, settlement, livelihood, institutions (formal and traditional), and historical. These will help assess the developmental needs of communities. In addition, it will assist efforts that attempt to prioritise, plan, and design appropriate community development programmes.

The CRDP will hinge on a three pronged strategy – agrarian transformation, rural development, and land reform. The agrarian transformation strategy intends to address farm-related bottlenecks. The rural development strategy emphasises optimal use and management of natural resources. It is to be achieved through strategic investment in economic and social infrastructure. The land reform plans to review restitution (fast-track processing of settled claims and settlement of outstanding claims), redistribution and tenure reform programmes introduced in 1994. This is to contribute to the ongoing effort to address past imbalances in access to land (MoRDLR, 2009).

The CRDP, unlike other rural development programmes, has not made agricultural development alone central to its rural development agenda. It views rural development in its totality. This is evidenced by the list of priorities that it has identified in pilot sites. The priorities encompass all activities that govern life in rural South Africa (see MoRDLR, 2009). They include access to resources, promotion of non-farm activities, access to social and human capital, democratisation of decision making processes, social cohesion, etc.

4. Data, Variables, and Methods

4.1. The data

The data used in this study came from the nationally representative StatsSA's 2009 General Household Survey (GHS). The survey covered 25 302 households, 9 780 of which came from rural areas. In this study, data from 8 967 rural households is analysed. This is after close to 8 % of the households had to be dropped due to missing information on some important variables.

4.1.1 Rural versus urban

There is no legal definition of rural areas in South Africa (MoRDLR, 2009). Two competing definitions are adopted, though, based on the functions these areas perform. The first is based on Statistics South Africa's (StatsSA) 1996 definition, according to which 'urban' refers to municipalities designated as cities, formerly 'white' towns, and their associated 'townships'. Everything else is classified as rural. These same boundaries were used in the 2001 census. In addition, recent surveys, including the GHS, still apply this old definition. This is long after all areas had fallen under municipal administration zones. This, StatsSA believes will allow comparison of surveys conducted in different years.

The second definition appeared for the first time in the Rural Development Framework (RDF), introduced in 1996. The framework defined rural as 'sparsely populated areas in which people farm or depend on natural resources, including villages and small towns that are dispersed throughout these areas, and large settlements in former homelands' (DoLA, 1997). In this study, we adopt StatsSA's definition. This is because it is our major source of data.

4.1.2   On livelihood strategy

In rural South Africa, people can obtain income from various sources. These include income from wages, salaries and commissions; income from own businesses; income from sales of farm produce and services, income from rents and interest; and finally income from remittances, pensions, and grants. We matched these income sources with certain broader activities or livelihood strategies. The following four major livelihood strategies were identified in the process – only farm, non-farm, farm and non-farm, and non-labour. Thereafter, each livelihood strategy was further categorised into wage and non-wage based activities. For example, a household which diversified its income sources into farm and non-farm sources could take up wage and non-wage activities. Wage activities refer to employment in non-farm salaried activities or employment on farms other than family farms. The latter is referred to in the literature as off-farm activities. Non-wage activities, on the other hand, could refer to a wide variety of self-employment opportunities such as own business (weaving, etc.), sales of farm produce and services, and rents and interests.

4.1.3 Per capita income versus consumption expenditure

In addition to the above, some form of welfare measurement is required for ordinal ranking of livelihood strategies. Two approaches, namely, per capita income and per capita expenditure, are used to classify livelihood strategies into high or low-income earning activities. In this study we have used the latter. This is motivated by the literature (see the literature section).

Per capita expenditure depends on household sizes. Household size in turn should depend on the gender as well as age composition of households. The literature provides two approaches to compute per capita expenditure (see literature section). In this study we apply an Adult Equivalence Scale (AES) to calculate household size and thus per capita expenditure.

We could come across no adult AES for South Africa. We adopted AES from the Organisation for Economic Cooperation and Development (OECD). It differentiates between adults and children and also takes into account economies of scale.

4.2 The method

In this section we demonstrate the methods applied. A two-stage approach was applied. In stage one, we applied a standard test of welfare dominance to rank outcomes from different livelihood strategies. In stage two, we fitted a multinomial logistic regression equation to identify factors that constrain households' entry into high-income earning livelihood strategies.

4.2.1 Stochastic dominance test

Consider distribution of independent samples of per capita expenditures (y) of households relying on any two livelihood strategies with cumulative distribution functions (CDF), F_A and F_B, with the lower bound of the common support fixed at 0 and the upper bound to any acceptable poverty line i.e. $[0, \bar{z}]$.

$$[1] \quad F_A(x) = \frac{1}{N}\sum_{i=1}^{N} 1(x_i^A \leq z), \quad F_B(x) = \frac{1}{M}\sum_{i=1}^{M} 1(x_i^B \leq z),$$

where x_i^A and x_i^B represent distribution of per capita expenditures of strategies A and B respectively, N & M represent sample sizes of the two strategies, and $1(.)$ takes a value of 1 when the argument is true and zero otherwise.

Let $D_A^1(x) = F_A(x) = \int_0^x dF_A(y).$ For any integer $s \geq 2$, where s is order of stochastic dominance, $D_A^s(x)$ take the form given by [2].

$$[2] \quad D_A^s(x) = \int_0^x D_A^{s-1}(y)dy$$

Livelihood strategy A is said to dominate livelihood strategy B at order s if $D_A^s(x) \leq D_B^s(x)$, for all $x \in [0, z_{max}]$, where z_{max} is the maximum acceptable poverty line. Strict dominance at order s holds when livelihood strategy A stochastically dominates livelihood strategy B up to the poverty line z if $D_A^s(x) \geq D_B^s(x)$ for all $x \leq z$.

Following Davidson and Duclos (2000), the general form of $D^s(x)$ can be expressed as

$$[3] \quad D^s(x) = \frac{1}{(s-1)!}\int_0^x (z-y_i)^{s-1}dF(y)$$

For a random sample of N independent observations, the natural estimator of $D^s(x)$ can be expressed as

$$[4] \quad \hat{D}^s(x) = \frac{1}{(s-1)!}\int_0^x (z-y_i)^{s-1}d\hat{F}(y) = \frac{1}{N(s-1)!}\sum_{i=1}^{N}(z-y_i)^{s-1}1(x_i^A \leq z)$$

Equation [3] could reduce to a Foster-Greer-Thorbecke (FGT) type poverty measure by varying the value of s. For example it reduces to F_A when s=1. It measures the prevalence of poverty. It gives the percentage of poor households that take on A as their major livelihood strategy. It reduces to a measure of depth of poverty when s=2, and to a measure of severity of poverty when s=3.

In this study, we are interested to test the superiority of one livelihood strategy over another only, i.e. we are not interested in the depth and severity of poverty among households that pursue different livelihood strategies. Therefore, we fix the value of s at one (s=1), i.e. the case of first order stochastic dominance.

There are different methodologies proposed to test for stochastic dominance of any two given livelihood strategies, say, A over B. The general hypothesis for testing the null hypothesis of stochastic dominance of order s H_0: $D_A^s(x) - D_B^s(x) = 0$ for all $z \in [0, \bar{z}]$ against its alternative of H_1: $D_A^s(x) > D_B^s(x)$ for some

$z \in [0, \bar{z}]$ could be tested using a t test. The variance needed to conduct the test i.e. $var\left(\widehat{D_A^s}(x) - \widehat{D_B^s}(x)\right)$ is given by $var\left(\widehat{D_A^s}(x)\right) + var\left(\widehat{D_B^s}(x)\right)$. The t-statistic on the basis of which H_0 is tested is given by

$$[5] \quad \left. D_A^s(x) - D_B^s(x) \middle/ \sqrt{var\left(\left(\widehat{D_A^s}(x)\right) + var\left(\widehat{D_B^s}(x)\right)\right)} \right.$$

A number of test points could be considered. We started from 10 % of the lower CDF in the pair-wise comparison. For stochastic dominance of strategy A over strategy B to be confirmed, the null hypothesis must be rejected, and the signs of all the t-statistics must be the same – in this case should be negative.

After stochastic dominance of one livelihood strategy over another was confirmed, we then applied a multinomial logistic regression function to identify factors constraining households' access to high-return livelihood strategies.

4.2.2 Multinomial logistic regression

In the previous section we demonstrated how a first-order stochastic dominance test could be applied to rank activities on the basis of their outcomes. Here we build on these results. We demonstrate the methodology known as multinomial logistic regression to answer to some of the questions why some poor households don't pursue high-return activities. In other words, the methodology will help to identify factors that create barriers to enter into high-return activities.

Households' decisions to take up a certain activity is assumed to depend on a number of factors. This could be expressed in a functional form as:

[6] $y_i = y_i(A_i(q_i))$, where per capita expenditure of household i ($y_1 i$) is a function of livelihood strategy (A_i), which in turn is a function of a host of factors such as household demographic characteristics, asset endowments, access to services, etc.

Given the multinomial nature of households' choice of activities, we formulate the multinomial logit model with N possible responses with probabilities $p_1, p_1, \dots p_N$ as

[7] $\log_e \left[\frac{P_{ji}}{P_{1i}}\right] = q_i \beta_j$ j= 2,3, …,N; $i = 1,2,3, \dots I$, where i is the observation index, I is the number of observations, q_i is the i'-th observation on a $1 \times K$ vector of explanatory variables, and β_j is a $K \times 1$ vector of parameters.

The probability that a household i belongs to the base category (livelihood strategy) is given by

$$[8] \quad P_{1i} = \frac{1}{1 + \sum_{j=2}^{N} e^{q_i \beta_j}}$$

The probability that a household i belongs to the other (j) livelihood strategies is given by

$$[9] \quad P_{ji} = \frac{e^{q_i \beta_j}}{1 + \sum_{j=2}^{N} e^{q_i \beta_j}} \quad\quad j = 2 \dots N$$

In this study, the marginal effects will be estimated to determine the effect of any of the q_i variables on households' choice of a given livelihood strategy.

$$[10] \quad \frac{\partial P_{ji}}{\partial q_i} = (\beta_j - \sum_{j=2}^{N} P_{ji} \beta_j) P_{ji}$$

5. Results and Discussion

In this section we analyse the results. This will be done in the following manner. First we will analyse households' sources of income on the basis of the classification criteria discussed in the previous section.

Second, the classification will be subjected to some form of welfare measure to identify high-return livelihood strategies.

In this study, welfare will be measured in terms of adult equivalent per capita expenditure, henceforth consumption expenditure. This is the preferred method compared to per capita income. The reader is referred to the literature section for more discussion of this.

The upper bound of the first expenditure quintile is equivalent to the universally accepted poverty line of 1 USD per day per person. The approach followed in this paper will allow the reader to draw a poverty line of his or her choice to compare the superiority of one livelihood strategy over others.

A priori investigation into households' sources of income in rural areas indicated that households depend on income from a variety of sources. This could create problems for our effort to identify dominant livelihood strategies in rural areas. To handle this we assigned a household to a given livelihood strategy on the basis of activities that it identified as its main source of income. This approach is commonly used in the literature.

5.1 On income diversification

In this section, we analyse the extent of income diversification in rural areas. We adopt a method from the literature to broadly classify rural households in South Africa into four, on the basis of their main sources of income – 'non-labour' income, 'only farm', 'farm and non-farm', and 'only non-farm' (Stifel, 2010; Corral & Reardon, 2001). The 'non-labour' income group represents households that rely on remittances, pensions, and social welfare; the 'only farm' group comprises households that derive income only from farming; the 'farm and non-farm' group from a mix of farm and non-farm activities; and the 'only non-farm' group only from non-farm activities.

As already indicated in the data and definition of variable section of this paper, households that take on the 'farm and non-farm' and the 'only non-farm' activities were further broken down into smaller sub groups – wage and non-wage. We could not do the same for 'only farm' group due to problems in the questionnaire design. Thus, our analysis of households that fall in this category will be partial. The GHS lumps together wages, salaries, and commissions. It doesn't specify the type of wages that households receive. Households could get employment in non-farm related activity or on other farms.

In theory, the 'only farm' group is made up of two sub-groups of households. The first includes those households that are self employed on their own farm. The second includes those households that earn wages from off-farm employment. The literature describes this kind of activity as off-farm activity. The group represents farm labourers that operate on commercial farms. Therefore, lack of clarification on the latter group of farmers forced us to classify the second group of households under the 'farm and non-farm' category.

TABLE 2 HERE

Next, we analysed the extent to which rural households diversified their income sources. Results are summarised in Table 2. Note that the summary excludes the 'only farm' group. This is because it accounted for less than 1 % of the rural households.

We find that 56 % of rural households derive their *main sources* of income from 'non-labour' income sources. Of this, 29 % are social grant recipients, 12 % pensioners, and the remaining 15 % depend on remittances from relatives residing in urban areas. Except for remittance-dependent households, the other two depend on state grants.

The second group of households – 'farm and non-farm' – account for about 16 % of rural households. Wage earners are the majority here (11 %). They derive their income from off-farm employment and non-farm related activities. The remaining 5 % derive income from non-wage sources. This includes income from own farm and non-farm related employment opportunities, and others.

The third group of households ('only non-farm') is the second biggest group after 'non-labour'. It accounts for about 28 % of rural households. The majority of households in this group earn wages from non-farm related activities (23 %). The self employed (non-wage earners) in this group, on the other hand, account for a mere

5 % of rural households. If we allocate 'non-labour' income households to the 'non-farm' group and work out percentages of households that rely on non-farm activities, we find that about 84 % of households derive their main source of income through direct employment in non-farm activities. This is a substantial figure by a developing country's standards. According to available studies, between 40 and 45 % of households in rural areas depend on non-farm activities (Little *et al*., 2001, and Reardon, 1997). This could be a reflection of the discriminatory policies of apartheid, which made farming less attractive to non-white South Africans.

Table 2 further shows that about 25 % of households in rural areas are poor. The majority of them (17 %) come from the 'non-labour' group, followed by the 'only non-farm' group (5 %), and 'farm and non-farm group (3 %). When looked at in terms of their distribution among sub-groups, more than half of poor households are either social grant recipients (10 %) or remittance-dependent (5 %).

In summary, the results suggest that income diversification is widespread in rural South Africa. Those that rely on non-labour activity account for the majority of rural households. These are households that depend primarily on others (the government and relatives) for their livelihood. It is also apparent from the discussion that of those that derive income primarily from production activities ('non-farm' plus 'farm and non-farm'), wage earners are the majority. This means that non-wage earners, i.e. the self employed, are the minority. The latter finding could imply lack of entrepreneurship in rural areas.

5.2 On livelihood strategies

In this section, we assess the superiority of one livelihood strategy over others. This will be done for the three major livelihood strategies plus seven other specific livelihood strategies (see Table 2 for the list). We do this by way of a descriptive analysis of the results presented in Table 3. Here, the percentage of households that rely primarily on a certain livelihood strategy is matched against expenditure quintiles.

It is apparent from Table 3 that households' reliance on 'non-labour' sources of income decreases with welfare. This is in line with *a priori* expectations. What was not expected, which is rather ironic, is the fact that significant proportions of richer households (16 %) are social grant recipients. Further analysis of the raw data revealed that about 81 % of them (of the 16 %) have no economically active member. They are made up of children, the elderly and disabled people. They depend on pensions (32 %), remittances (24 %), and social grants (44 %). Eight types of social grants are administered by the state – old-age grants, disability grants, child support grants, care dependency grants, foster care grants, war veterans grants, grants-in-kind, and social relief of distress. The fact that these households fall in the fourth quintile (richest quintile) might call for a further and in-depth analysis. It could raise serious questions concerning the very purpose of social grants.

Table 3 shows a positive relationship between non-farm and welfare, measured in terms of adult equivalent per capita consumption expenditure. The percentage of households with 'only non-farm' as their major sources of income rises by expenditure quintile, with 16 % falling in the poorest quintile and 42 % in the richest.

Table 3 further depicts differences in welfare status between wage and non-wage earners within a group. We find that the percentage of households with wage income rises by expenditure quintile. For example, for the 'only non-farm' group 13 % fall in the poorest quintile and 39 % in the richest; and for the 'farm and non-farm' group, 9 % fall in the poorest and 17 % in the richest quintile. But this is not true for non-wage income earners, for which no clear relationship could be established. In general, the results suggest that households that rely only on non-farm activities are relatively better off than households that fall into other groups. This means that 'only non-farm' is a superior livelihood strategy.

TABLE 3 HERE

5.3 On first order stochastic dominance

The primary objective of this section will be to apply a formal first order stochastic dominance test to compare superiority of the 'only non-farm' activity over 'farm and non-farm' and 'non-labour' activities. In essence, we

will attempt to confirm our finding in the previous section. The test will be based on the methodology of Davidson and Duclos (2000). We test the null hypothesis that the vertical distance between, say, the 'only non-farm' distribution and 'farm and non-farm' distribution at any specified poverty line is zero.

Figure 1 provides a combination of potentially comparable distributions. Figure 1a plots cumulative distribution functions representing 'only non-farm', 'farm and non-farm' and 'non-labour'. Figures 1b through 1f plot distributions drawn from within and across broader groups. For example, Figures 1b, 1c, and 1f plot distributions from within 'only non-farm', 'farm and non-farm', and 'non-labour' groups, respectively. Figure 1d and 1e, on the other hand, make across group comparison of distributions.

Figure 1a shows no clear ordering of livelihood strategies for per capita consumption expenditure levels that are less than R200. However, for poverty lines that fall within the R200 and R600 range, accounting for about 60 % of rural households, the cumulative distribution function of 'only non-farm' is below 'farm and non-farm' and 'non-labour income' distributions. We applied the method of Davidson & Duclos (2000) to statistically validate the dominance of 'only non-farm' over the others. Test results confirmed first-order stochastic dominance (superiority) of 'only non-farm' over the other two livelihood strategies (Appendix 1). In addition, we tested for the dominance of 'farm and non-farm' over 'non-labour' (Appendix 1). Results suggest that the 'farm and non-farm' activity is superior to the 'non-labour' activity. This means that the three major livelihood strategies could be ordered in the order of their contribution to welfare as – 'only non-farm', 'farm and non-farm', and 'non-labour'. The tests were conducted on 100 test points drawn from within the R200 and R600 adult equivalent per capita expenditure band.

FIGURE 1 HERE

Figure 1 furthermore plots other distributions for comparison purposes. This allows inter- as well as intra-livelihood strategy comparisons. For example, one might be interested in analysing welfare differences among non-farm households that rely on wage and non-wage (self-employment) activities (Figure 1b and 1c) or between the welfare status of wage dependent households that sit across livelihood strategies – 'non-farm' and 'farm and non-farm' (Figure 1d). The former could shed some light on the question as to whether self employment as opposed to wage employment contributes more to the reduction of poverty in rural areas. This could add a different spin to the existing discourse by pushing it beyond the farm versus non-farm debate that has dominated the literature for so long.

We find that wage employment in general is superior to self-employment in rural areas. This is evidenced by Figures 1b and 1c. This could be attributed to a host of factors. Lack of markets for goods that self-employed households produce, due to penetration of urban-based manufactured goods even into the remotest markets, could be one of the many reasons.

Figure 1d compares income earning potentials of wage employment in the 'only non-farm' and 'farm and non-farm' activities. Results show that 'only non-farm' wage dominates 'farm and non-farm' wage (Figure 1d).

In South Africa, sizable percentages of wage earners that fall under the 'farm and non-farm' group are farm labourers. However, due to a problem in questionnaire design, we were unable to calculate the proportion of households that take on off-farm employment. Therefore, we were unable to conclude as we did for others the superiority (or not) of 'only non-farm' wage over off-farm wage income. Note that the off-farm group represents those households that rely on income from employment on farms other than family owned farms.

In summary, results from this section indicate that the 'only non-farm' activity is superior activity in rural areas. Furthermore, we made inter- and intra-group comparisons, which enabled us to rank livelihood strategies as follows in the order of their superiority (a) 'only non-farm' wage earners, b) 'farm and non-farm' wage earners, (c) 'farm and non-farm' non-wage earners, (d) pensioners, (e) 'only non-farm' non-wage earners, (f) remittances, and (g) social grants. See Figures 1b through 1f.

5.4. Entry barriers to high- return livelihood strategies

In this section we analyse variables presumed in the literature to have an effect on households' choice of high-return livelihood strategies. High-return activities (livelihood strategies) henceforth refer to the first three high-return activities we found in the previous section. These include 'only non-farm wage', 'farm and non-farm wage', and 'farm and non-farm non-wage'. On the other hand, less remunerative livelihood strategies represent, from superior to inferior, pension, 'only non-farm non-wage', remittances, and social grants.

The literature has identified a number of variables with the potential to affect households' choice to participate in a livelihood strategy. These include the gender of household heads, the education level of household heads, the age of household heads, households' access to social infrastructure, and household structure (family size, the composition of different age groups in the total family size). According to the empirical literature, compared to their male counterparts, the majority of female headed households derive income from less remunerative activities. This is attributed to a range of factors that fall under the broader social, political, and economic factors that they face. In addition, the empirical literature has found that households headed by people who are well educated, with better life experiences (measured by age), and that reside in communities well served by social infrastructure are expected to engage in relatively more remunerative livelihood strategies (see literature section for more discussion on this).

Table 4 shows that the majority of households that take up high-return livelihood strategies are headed by men not by women. Table 4 further shows that households that take on high-return activities are headed by people who fall within the mature (experienced) age band of 40 to 50 years. For example, the average ages of a household head in the high-return activities are respectively 43, 48, and 48 years. This is far lower than the average age of those that depend on less remunerative activities. For example, the average age of 'only non-farm non-wage', pension, and grant recipients are respectively 56, 70, and 57 years. The results imply positive covariance between high-return activities and gender and age (a measure of experience) variables.

TABLE 4 HERE

Next, we analysed the effect on choice of a livelihood strategy of household structure and availability of social infrastructure in communities where rural households reside. We find that households that pursue high-return livelihood strategies have a relatively large number of economically active members. In addition, they have relatively smaller numbers of dependants (children and elderly people). We also found a positive relationship between social infrastructure and welfare. Table 4 shows that households that take up high-return activities reside in communities with a relatively higher level of connectivity to municipal services such as water and electricity.

The last variable analysed was the level of education of households' heads. A number of studies for other developing countries have found that households with higher levels of education engage in high-return livelihood strategies. The results presented in Table 4 are no different from this popular view. We find that, on average, most households with no education rely on less remunerative livelihood strategies. On the contrary, households with relatively high levels of education adopt high-return activities.

In general, the results presented in Table 4 suggest that poor households' entry into high-return livelihood strategies is constrained by gender, age, household structure, education, and social infrastructure in the community they live in. This means that policies that plan to encourage poor households' participation in high-return livelihood strategies should take note of these constraints.

TABLE 5 HERE

Next, we applied a more robust approach to confirm the validity of these results. This was done with the help of multinomial logistic regression. One important advantage of multinomial logistic regression analysis over descriptive analysis is that it allows analysis of the impact of each individual variable on households' choice of a particular livelihood strategy assuming that the other variables remain unchanged. A multinomial logit model similar to the one given by equation [7] was fitted. As indicated earlier, the following variables were used in the literature as potential determinants of households' choice for a particular livelihood strategy: gender of household head; age of household head; family size; share of children under 5 years; share of children under 17 years; share of adults over 60 years and number of economically active members; educational level of household head classified into five groups – no education, primary education, lower secondary, upper secondary, and post secondary; community characteristics such as household's access to piped water, electricity, and telephone lines.

Table 5 summarises estimated coefficients and estimated marginal effects. Marginal effects could be interpreted as the effect of a one-unit change in the independent variables on a household's choice of a particular livelihood strategy. We left out the social grant category from the estimation. It identified a number of potential barriers to practicing superior livelihood strategies. These include gender of household head, age of household head, family size, number of economically active members, access to water, access to electricity, access to cell phone, and education.

Some of these variables are common to the first two superior livelihood strategies. These include gender, family size, age of household head older than 60 years, and community characteristics. This means that households headed by men, with large family size, with age of household head not more than 60 years, and situated in communities with better municipal services (water, electricity, and telephone lines) are more likely to adopt 'only non-farm wage' and the 'farm and non-farm wage' activities. For example, female-headed households are about 5 % less likely to adopt 'farm and non-farm wage' and 'farm and non-farm non wage' activities.

Table 5 further shows that households headed by people with lower secondary and post-secondary levels of education are 4 % and 33 % more likely to adopt the 'farm and non-farm wage' livelihood strategy than those with no education at all. In general, the results indicate that gender, age, family size, access to better municipal services, and education are some of the barriers that poor households face to entering into high-return livelihood strategies. On the contrary, households headed by women, children, and older people, that live in a community with less social infrastructure and whose heads are less educated, are more likely to adopt less remunerative livelihood strategies. For example, we find that households headed by women, children under the age of 5 and 17, and people older than 60 are respectively 6 %, 5 %, 6 %, and 3 % more likely to depend on remittances.

6. Concluding Remarks and Policy Implications

In this paper we asked some pertinent questions around the roles that livelihood strategies in the rural economy play in poverty reduction. We believe the results found will contribute towards the ongoing effort to address issues of rural development through the Comprehensive Rural Development Programme (CRDP). The study was based on a recent (2009) nationally representative survey (GHS) of Statistics South Africa.

We examined the various activities that households in rural areas pursued in the study period. Here, we summarise some of the important results found:
(a) There is very high level of income diversification in rural areas (Table 2);
(b) Households rely on four broad livelihood strategies – 'only farm', 'farm and non-farm', 'only non-farm', and 'non-labour' (Table 3);
(c) Close to 56% of rural households depend on non-labor sources of income (remittances, pensions, and social grants). Social grant recipients account for about 29% of rural households;
(d) We could subdivide the four broad livelihood strategies into seven specific livelihood strategies – 'farm and non-farm wage', 'farm and non-farm non-wage', 'only non-farm wage', 'only non-farm non-wage', remittances, pensions, and grants;
(e) Overall, the non-farm is a superior activity in rural areas (Figure 1);
(f) We could rank the seven livelihood strategies in order of their superiority as 'only non-farm' wage earners, 'farm and non-farm' wage earners, 'farm and non-farm' non-wage earners, pensioners, only non-farm non-wage earners, remittances, and social grants (see Figures 1b through 1f). The finding that wage earners are better off in rural areas than those that rely on farming is similar to that was found by Carter and May (1999) and Leibbrandt, *et al*., (2000);
(g) Poor households face some barriers to entering into high-return non-farm activities. They include demographic factors (age, and gender of household heads), human capital (labour endowments and education), and social infrastructure (access to water, electricity, telephone lines).
 (h) In general, the results suggest that the fight against poverty in rural areas can't be won with a mere focus on agricultural development. Employment creation through non-farm activities should also be considered important routes out of poverty.

The above findings have the following policy implications:
(a) The fact that close to 56% of rural households depends on non-labor sources of income (pensions 12%, social grants 29%, and remittances 15%) indicates higher level of dependence of rural areas on the government and migrant labor. The number of social grants recipients is increasing. Although the contribution of social grants in fighting poverty in rural areas is not questioned, its viability from the stand point of sustainability considerations warrants attention.
(b) The finding that wage earners engaging in non-farm and farm activities are better off suggests promotion of wage employment opportunities in rural areas. This could come in the form of promotion of investment in employment intensive non-farm and farm activities in rural areas. Wage employment in farm activities could be created through support to emerging and commercial farms. Commercial farms have remained major sources of livelihood to sizable number of farm labourers in South Africa.
(c) To address poor households' access to high income activities, the following socio economic policies, among others, are critical – policies that promote participation of women in economic activities; promotion of education in rural areas in general; and policies that could address causes of rural-urban migration. In addition, investments in basic infrastructure (access to water, electricity, and communication services) are crucial. Such investments play catalytic role as they lay the basis for the flow of funds to the rural areas to be invested in farm and non-farm activities to create more job opportunities.

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Appendix 1: Stochastic dominance test
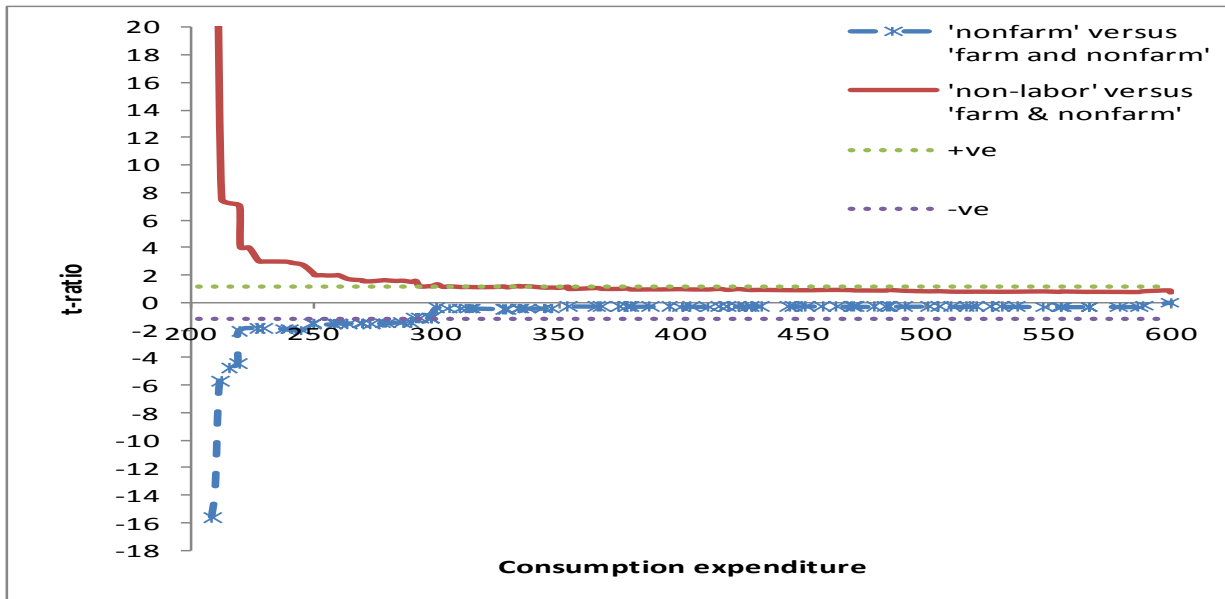
Source: Authors' computation

Table 1: Chronology of Rural Development Framework in South Africa

Period	Macroeconomic framework	Legal and policy framework (Rural Development)	Strategic framework (Rural Development)
1994 - 1996	Reconstruction and Development Programme (RDP)	Restitution of Land Rights Act, 22 of 1994; Development Facilitation Act, 67 of 1995; Constitution, Act 108 of 1996	National Rural Development Strategy (NRDS); Land redistribution, restitution, and tenure security; Rural Development Strategy (RDS)
1996 - 2009	Growth, Employment and Redistribution Strategy (GEAR); Accelerated and Shared Growth Strategy of South Africa (ASGISA)	Extension of Security of Tenure Act, 62 of 1997; Transformation of Certain Rural Areas Act, 94 of 1998; Communal Land Rights Act of 2004	Rural Development Framework; Integrated Sustainable Rural Development Strategy (ISRDY); The National Spatial Development Perspectives (NSDP); The Integrated Food Security Strategy; Land and Agricultural Reform Project; Comprehensive Agricultural Support Programme (CASP); National Sustainable Development Framework
2009 - present	Medium Term Strategic Framework (MTSF)		Comprehensive Rural Development Programme (CRDP)

Source: Authors' compilation based on literature review

Table 2: Sources of household income in rural South Africa in per cent

	Non-labour income				Farm and non-farm			Only non-farm		
	Remittances	Pension	Social grants	Total	Wage	Non-wage	Total	Wage	Non-wage	Total
Total	15	12	29	56	11	5	16	23	5	28
Quintile										
Q1	5	3	10	17	2	1	3	3	2	5
Q2	4	3	8	15	2	1	3	5	1	6
Q3	4	4	7	15	2	1	3	6	1	7
Q4	2	3	4	8	4	1	5	9	1	10

Source: Own calculations using data from 2009 GHS. Numbers don't add up to 100 due to a rounding problem.

Table 3: Livelihood strategies in rural South Africa by expenditure quintile

		Expenditure			
Category	**Livelihood strategies**	**Q1**	**Q2**	**Q3**	**Q4**
Only farm	**Total**	**0.0**	**0.0**	**0.1**	**0.0**
	Non-wage total	0.0	0.0	0.1	0.0
	sales of farm products and services	0.0	0.0	0.1	0.0
Only non-farm	**Total**	**16.1**	**23.6**	**27.1**	**42.3**
	Wage total	13.2	20.3	24.1	38.7
	Salaries/wages/commission	13.2	20.3	24.1	38.7
	Non-wage total	2.9	3.2	3.0	3.6
	Income from business	2.5	2.8	2.6	3.2
	Sales of farm products and services	0.0	0.0	0.0	0.0
	Other income sources	0.4	0.4	0.4	0.4
Farm & non-farm	**Total**	**11.1**	**12.4**	**11.9**	**21.9**
	Wage total	8.5	9.6	10.0	17.1
	Salaries/wages/commission	8.5	9.6	10.0	17.1
	Non-wage total	2.6	2.8	1.9	4.7
	Income from business	2.1	2.4	1.6	3.6
	Sales of farm products and services	0.1	0.2	0.0	0.9
	Other income sources	0.4	0.2	0.3	0.2
Non-labour income	**Total**	**72.8**	**64.0**	**60.9**	**35.8**
	Remittances	19.7	16.9	16.9	8.4
	Pensions	10.7	14.2	15.9	11.0
	Grants	42.4	32.8	28.1	16.4
Total		**100**	**100**	**100**	**100**

Source: Own calculations using data from 2009 GHS. Numbers don't add up to 100 due to a rounding problem.

Table 4: Summary statistics on households' choice of livelihood strategies
Source: own calculations using 2009 GHS

| | Only non-farm | | | | Farm and Non-farm | | | | Non-labour | | | | | |
| | wage | | Non-wage | | Wage | | Non-wage | | Remittance | | Pension | | Grants | |
Variables	mean	Std dev	mean	Std dev	mean	Std dev	mean	Std dev	mean	Std dev	mean	Std dev	mean	Std dev
Gender	0.68	0.47	0.39	0.49	0.61	0.49	0.66	0.48	0.33	0.47	0.39	0.489	0.36	0.48
Age	42.76	12.32	56.14	16.77	47.89	11.87	48.5	12.17	38.54	14.87	69.86	10.70	57.4	16.68
Family size	3.23	2.34	4.81	2.66	4.52	2.57	4.16	2.50	3.51	2.29	4.40	2.78	4.97	2.65
Child <=5	0.08	0.13	0.13	0.16	0.10	0.14	0.11	0.15	0.11	0.16	0.09	0.14	0.14	0.16
Child <=17	0.22	0.25	0.42	0.26	0.34	0.25	0.34	0.26	0.41	0.30	0.31	0.25	0.43	0.23
Adult>=60	0.03	0.13	0.18	0.27	0.05	0.15	0.07	0.19	0.02	0.12	0.39	0.30	0.19	0.29
# Econ active	0.60	0.34	0.10	0.21	0.40	0.28	0.40	0.31	0.04	0.13	0.05	0.12	0.05	0.13
Pipe water	0.53	0.50	0.25	0.43	0.43	0.50	0.34	0.47	0.30	0.46	0.30	0.50	0.23	0.42
Electricity	0.80	0.40	0.70	0.46	0.78	0.42	0.79	0.41	0.75	0.43	0.76	0.43	0.69	0.46
Cell phone	0.80	0.40	0.78	0.41	0.89	0.31	0.90	0.30	0.83	0.37	0.77	0.42	0.77	0.42
No educ.	0.12	0.33	0.33	0.47	0.13	0.34	0.11	0.32	0.14	0.34	0.50	0.50	0.36	0.48
Educ. primary	0.21	0.41	0.31	0.46	0.23	0.42	0.20	0.40	0.21	0.41	0.28	0.45	0.32	0.47
Lower sec.	0.19	0.40	0.16	0.37	0.18	0.38	0.18	0.37	0.17	0.38	0.15	0.35	0.16	0.37
Upper sec.	0.39	0.49	0.18	0.38	0.31	0.46	0.39	0.49	0.45	0.50	0.05	0.23	0.16	0.38
Post Sec	0.08	0.28	0.01	0.10	0.14	0.35	0.11	0.32	0.03	0.16	0.02	0.14	0.01	0.08

Table 5: Regression analysis of household livelihood strategy choice in rural areas

Variables	Only non-farm				Farm and Non-farm				Non-labour			
	wage		Non-wage		Wage		Non-wage		Remittance		Pension	
	Coeff.	Marg. effect	Coeff.	Marg. Effect	Coeff.	Marg. effect	Coeff.	Marg. effect	Coeff.	Marg. effect	Coeff.	Marg. effect
Intercept	-5.019	-0.004*	-4.798	-0.004*	-5.315	-0.003*	-7.102	-0.001*	2.546	0.186*	-4.720	-0.005*
Gender (1m, 0f)	0.741	0.037*	0.679	0.024*	0.775	0.045*	0.801	0.051*	-0.572	-0.057*	0.017	-0.050
Age	-0.010	-0.001*	-0.015	-0.002*	0.009	0.000	0.006	0.000	-0.045	-0.006*	0.047	0.008*
Household												
Family size	0.099	0.012*	-0.055	-0.003	0.135	0.018*	0.056	-0.003	-0.192	-0.025*	0.047	0.004*
Child <=5	-0.294	0.009	-0.455	0.009	-0.484	0.009	-0.831	0.009	-1.248	-0.054*	-0.330	0.009
Child <=17	-0.259	0.020	-0.278	0.020	-0.424	0.020	0.529	0.020	-1.105	-0.056*	-0.617	-0.046*
Adult>=60	-5.459	-0.007*	-4.481	-0.016*	-5.413	-0.008*	-4.465	-0.016*	-3.570	-0.033*	0.903	0.239*
# Econ active	11.444	0.263*	6.900	-0.033*	10.305	-0.187*	7.265	-0.044*	-0.980	0.000*	-0.389	0.000
Community												
Pipe water	0.793	0.084*	0.557	0.026*	0.563	0.027*	-0.102	-0.041	0.110	-0.041	0.301	-0.015*
Electricity	0.573	0.015*	1.061	0.158*	0.154	-0.046	0.472	-0.002*	0.223	-0.031*	0.132	-0.046
Cell phone	0.557	0.016*	0.530	0.011*	0.730	0.052*	0.542	0.013*	0.252	-0.025*	0.239	-0.026*
Race	1.062	0.076*	0.731	0.000*	0.169	-0.058	1.278	0.156*	0.467	-0.058	0.259	-0.058
Education												
primary	-0.211	-0.020	0.140	-0.020	0.338	0.032*	0.486	0.067*	-0.036	-0.020	-0.057	-0.020
Lower sec.	0.459	-0.028*	0.700	0.003*	0.886	0.040*	1.231	0.151*	0.075	-0.055	0.079	-0.055
Upper sec.	0.325	-0.040*	0.658	-0.005*	0.901	0.042*	1.251	0.157*	0.256	-0.044*	-0.251	-0.055
Post Sec	1.663	-0.062*	1.244	-0.076*	2.908	0.336*	1.951	-0.033*	0.537	-0.052	1.675	-0.061*

Source: Authors' computation based on GHS 2009 data

* represents level of statistical significance at least at 10 %

Note: The category left out is 'social grants'

Note: Marginal effects show the average change in the probability of livelihood strategy resulting from a unit change in the independent variable. The marginal effects sum to zero across the categories.
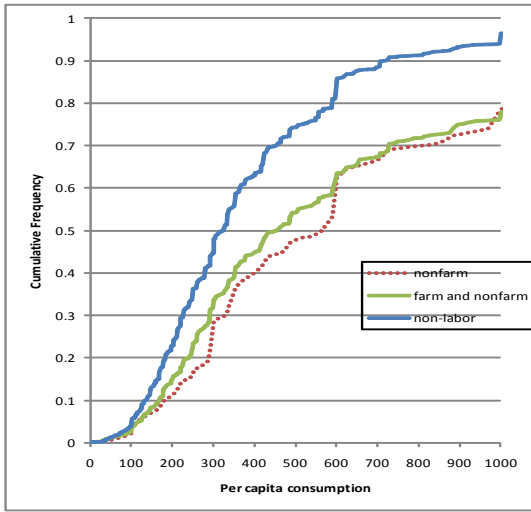
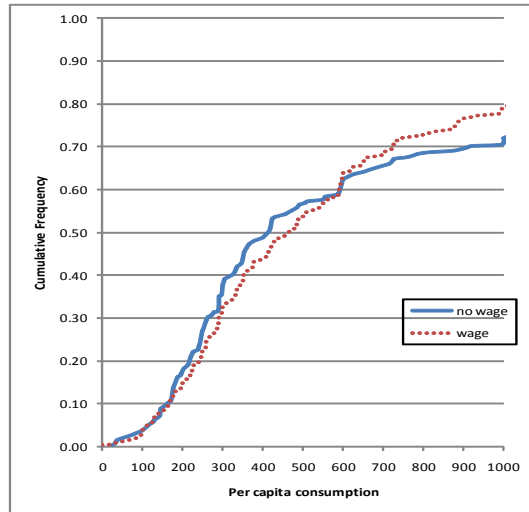Figure 1a: Only farm, Farm and nonfarm, and nonfarm

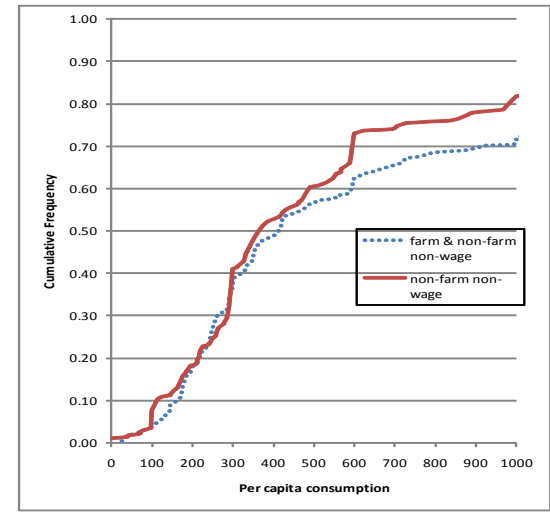Figure 1c: Farm and nonfarm: wage versus non-wage
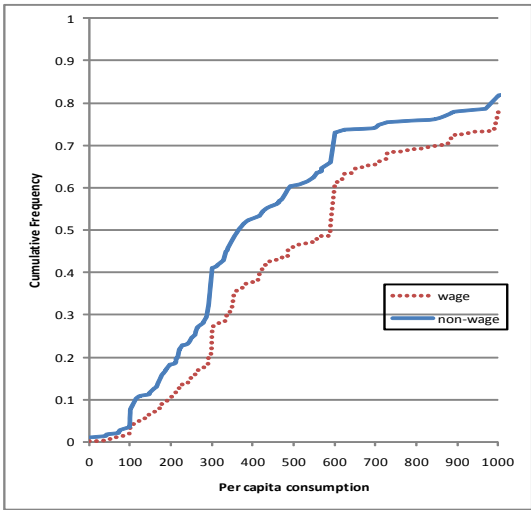
Figure 1e: Nonfarm and farm & nonfarm: non-wage

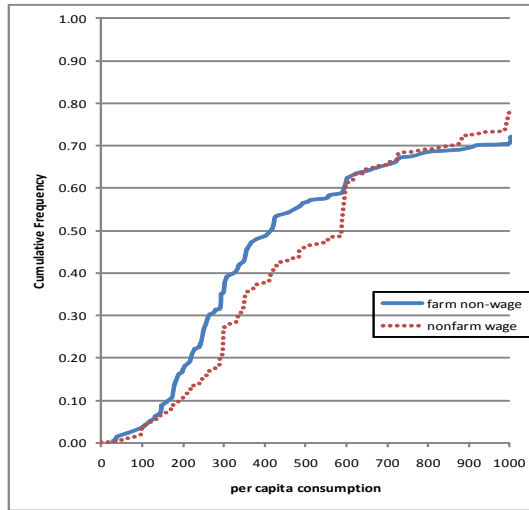Figure 1b: Nonfarm: wage versus non-wage

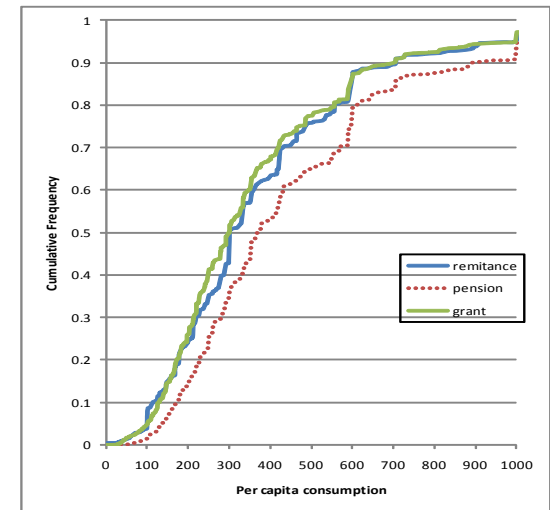Figure 1d: Farm versus nonfarm:wage

Figure 1f: Non-labor sources of income

Figure 1: Cumulative Frequency of Consumption Expenditure

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