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Rural income portfolios, compositions, diversity and determinants: Evidence from Nyandeni local municipality, South Africa

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Abstract

Agriculture is a significant source of livelihood for most rural communities in South Africa. Sadly, poverty and food insecurity, in these areas, remains a challenge suggesting that agriculture alone may not be sufficient to address poverty and food security issues. To understand other livelihoods sources pursued by rural communities, this paper investigated rural income portfolios, compositions, diversity and determinants of income portfolio selection choice using cross sectional survey data from Nyandeni Local Municipality in South Africa. Results revealed a rural community highly dependent on external social grants with minor reliance on local income generating activities with very poor local income portfolio diversity. Locally, crop and livestock production, money lending, spaza shops, taxi business and hawking emerged as the main income portfolios. Regression estimates on income portfolio selection choices reinforce the importance of education, employment status, active family members, child support grant and gender as significant household socio-economic attributes. We therefore argue that, to promote rural food security, and possibly address rural development: policy, research and investment should focus on promoting local communities` access to other non-conventional income activities – thus diversifying their income portfolios and creating strategic local village enterprises (spaza hops, money lending, hawking) capable of addressing missing rural markets. Thus far, current and future thinking should start viewing village enterprises as strategic rural development hubs capable of creating rural employment, income, financial markets, input markets and product markets in areas where the commercial private sector has failed to penetrate.

Keywords: Rural Income Portfolios; Making Markets Work for The Poor; Using Markets to Drive Rural Development

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1. Introduction

The generic view when it comes to the rural sector in Africa is that of a region driven almost entirely by agriculture (Babatunde, 2008; Ibekwe, 2010; Funmilola Fausat, 2012; Senadza, 2012) where agriculture is sometimes narrowly confined to mean livestock (beef) and crop (maize) production. With that background, rural development initiatives have focused more on rural farm productivity and agricultural growth as a pathway out of poverty (Babatunde, 2008). However, literature suggest that, unlike in many Asians and Latin American countries where agriculture has played a significant role in rural development and poverty reduction, the same is yet to materialize in Africa (Ellis, 2000; Babatunde, 2008; Ndhleve et al., 2013).

Contrary to this narrow agricultural based view of the rural sector, Babatunde (2008), argue that very few rural communities generate all their income from one livelihood source and use their assets in just one livelihood portfolio, but rather, they earn income from many different livelihood portfolios (Dercon and Krishnan, 1996; Barrett et al., 2001; Block and Webb, 2001; Senadza, 2012). Thus far, literature is currently pointing to the increasing role of off-farm income in poverty reduction (FAO, 1998; Matshe and Young, 2004; Winters et al., 2010; Haggblade et al., 2007). High level of skepticism therefore surrounds the relevance of agriculture alone to address growth and poverty reduction in rural Africa (Ellis, 2000; Babatunde, 2008; Ndhleve et al., 2013).

Despite the emerging significance of several rural off-farm income portfolio activities, not much is however known about them and the role they may play in rural household income generation strategies (Escobal, 2001; Tasie et al., 2012). Also, failure to recognize multiplicity and heterogeneity in rural assets portfolios as well as the range of activities pursued by rural communities to sustain their livelihoods has been cited as the main cause of poverty in rural Africa (De Janvry and Sadoulet, 2001). Based on the above literature insights, this paper estimated rural income portfolios, their composition, portfolio diversity and potential determinants of participation based on cross sectional data gathered from Nyandeni rural communities of South Africa. The structure of the paper is as follows: In section 1 the paper presents the introduction, section 2 presents the problem statement and objectives, section 3 summarizes the related literature and the methodological framework, section 4 describes the results and section 5 draws some conclusions and policy insights.

1.1. Problem statement

Current thinking in literature postulates a relative decline in smallholder rural agriculture caused by growth in rural non-farm activities (Davis et al., 2017). Van den Berg and Kumbi (2006) argued that rural agricultural activities are sometimes too limited to take up all the household labour force, meaning off-farm activities may offer a complementary alternative remunerative allocation of their labour especially during off-peak agricultural seasons. This may also increase and cushion rural income fluctuations capable of improving livelihood security (Lanjouw and Lanjouw, 2001; Haggblade et al., 2007). Nevertheless, non-farm activities are still closely linked to agricultural activities through investment, production and consumption in the rural economy and both form a crucial part of complex livelihood strategies adopted by rural communities (Davis et al., 2017). With that background, off-farm portfolio activities form an essential factor in the analysis of rural livelihood coping strategies and design of rural development pathways (Reardon et al., 2001). Davis et al.,

(2017), opined that rural income diversification is the norm not an exception and that off-farm diversification is common in the whole rural economy. Climatic change, rapid population growth and limited agricultural opportunities have also given rise to off-farm activities and rural income diversification.

Sadly, literature also suggests that these potential off-farm benefits do not necessarily accrue to the rural poor (Van den Berg and Kumbi, 2006). Gaps remain in the African context due to data limitation; whether Africa is following conventional wisdom when it comes to economic transformation as witnessed in Asia (Davis et al., 2017). Several authors rather argue that, in Africa, the share of off-farm income in total household income is higher for wealthy households than for the poor mainly because of entry barriers (Reardon et al., 2001; Barrett et al., 2001; Ellis and Freeman, 2004). As a result, literature suggests that, the off-farm economy in rural Africa does not reduce poverty but rather increases the inequality gap (Van den Berg and Kumbi, 2006).

As suggested by Escobal, (2001) and Tasie et al., (2012), the real issue could be due to the fact that not much is known about off-farm income portfolios and their role in rural household income generation. This could have emanated from the traditional image of rural households exclusively defined as farmers with little or no rural off-farm activities (Funmilola Fausat, 2012; Senadza, 2012; Katera, 2013). Need therefore arises for a paradigm shift from the traditional focus of the rural economy as confined in agriculture to a more accommodative diverse approach with off-farm activities.

1.2. Objectives

- To estimate rural income portfolios, composition and diversity
- To estimate determinants of participation in rural local income portfolio activities

1.3. Related literature

This section presents a summary of related literature on rural income portfolio activities, their compositions and determinants.

1.3.1. Rural income portfolio activities and their composition

Voluminous literature has focused and investigated the significance and characteristics of rural non-farm income and employment in developing countries; determinants of household participation, determinants and extend of diversification of rural income portfolios (FAO, 1998; Barret et al., 2001; Haggblade et al., 2007; Winters et al., 2010, 2010; Davis et al., 2010, 2017). Ndhleve et al., (2013) noted that several attempts have been made in literature to classify economic activities undertaken by rural communities across Africa. Broadly, three categories exist as follows; on-farm activities, off-farm activities (Machethe, 2004; Perret et al., 2005) and transfers (Davis and Pearce, 2001). In Africa the proportion of non-farm income to total rural household income is estimated to range from 35% to 50% (Holden et al., 2004; AllAfrica.com, 2007; Haggblade *et al*., 2010) with a global estimate as high as 58% (Davis et al., 2007). From the Eastern Cape province, former homeland areas of Limpopo and North West province of South Africa, Fraser et al., (2003) noted that rural households derive income from own business, own agriculture, wage income, remittances and

pensions/grants (Perret et al., 2005). Literature therefore suggests high level of income diversification as a typical practice in most rural areas (Otsuka and Yamano, 2006).

1.3.2. Determinants of participation in rural income portfolio activities

Literature suggests that rural households` income portfolio activity diversification is conditioned by individual characteristics, household characteristics and community variables (Davis, 2003; Sanchez, 2005; Matsumoto et al., 2006; Neudert et al., 2015). Individual characteristics like age (Schwarze, 2004; Matsumoto et al., 2006), gender (Davis, 2003; Matsumoto et al., 2006), marital status and level of education (Bryceson, 2002; Davis, 2003; Sanchez, 2005; Neudert et al*.,* 2015) are reported in literature.

Households` access to land (Parkin, 2008), asset endowments – in terms of human capital, physical capital, social capital, and organizational capital (Escobal, 2001; Holden et al., 2004; Sanchez, 2005), demographic composition and transfers (Chaplin et al., 2000; Davis, 2003) may condition the capability to participate in non-farm activities (Matsumoto et al., 2006). Also community variables like infrastructure, community average land productivity, distance to market and distance to government support agencies may condition participation of rural households in non-farm activities (Perret, 2002; Machethe, 2004; Matsumoto et al., 2006).

1.3.3. Literature insights

Rural households engage in diverse income portfolio activities broadly categorised as; on-farm activities, off-farm activities and transfers (Perret et al., 2005; Davis et al., 2017). Literature suggests that, recently there has been a significant growth in the contribution of the off-farm income portfolio activities to total household income (Haggblade et al., 2010; Neudert et al., 2015; Davis et al., 2017) although the actual benefit to the poor is highly questionable (Ellis and Freeman, 2004; Van den Berg and Kumbi, 2006). However, several individual, household and community variable *cum* barriers prohibit full potential utilisation of these activities by households (Matsumoto et al., 2006). The paper therefore estimated rural income portfolios, their compositions and potential correlates based on a cross sectional survey study from Nyandeni municipality, South Africa.

2. Methodology

The paper estimated rural income portfolio activities, compositions, diversity and their determinants based on a cross sectional survey study from Nyandeni, South Africa. A total of 1261 respondents were randomly selected for a face to face interview. Descriptive statistics was used to estimate rural income portfolio activities and their compositions. For the determinants of participation, the paper proceeded as follows: Literature suggest that participation of rural communities in various income portfolio activities arises as a result of a complex interplay of several individual, household and community variables (Davis, 2003; Sanchez, 2005; Matsumoto et al., 2006). Against this background, this paper hypothesizes that participation in rural local income portfolio activities can be associated with household and community attributes.

The following local income portfolio activities were common from the study area; (a) off-farm and (b) on-farm activities, although their contribution to total household income was very low. For on-farm, the following activities were well-defined; crop and livestock production. With reference to off-farm the following activities were reported, spaza shops, taxi businesses, hawking, building, selling liquor, lending money, plumping and carpentry. The last two activities (plumping and carpentry) were dropped because of low participation numbers. Eight activities were therefore considered as the main local income portfolio activities pursued by rural communities from the study area. These eight activities were taken as the dependent variable in a binary formulation for each activity.

Thus far, to estimate the decision of the household to participate in any local income portfolio activity the paper employed a binary choice model based on a maximum likelihood method. Dummy dependence variable of 0 and 1 was used as follows; 0 for non-participants of the specific income portfolio activity and 1 for participants. Following Greene (2000), given the value of the independent variables, the estimated value for the dependence variable could be interpreted as the probability to participate in the specific rural local income portfolio activity under consideration specified as follows;

$$Y_i^* = \beta X_i + \mu_i \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 1$$

Where:

- Y_i = 1 (participate in a specific local income portfolio activity) if $Y_i^* > 0$
- Y_i = 0 (did not participate in a specific local income portfolio activity) if $Y_i^* < 0$
- β = estimated parameter
- X_i = vector of independent variables
- μ_i = error term

The probability of individual *i* to participate in a specific local income portfolio activity (say hawking, livestock production, crop production, spaza shop, lending money etc) or not [Pr(Y = 1)] depends on the vector of individual, household and community variables specified as follows;

$$\Pr(Y_1 = 1) = \beta_0 + \beta_1 INDC + \beta_2 HHC + \beta_3 CV + \mu_i \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots .2$$

Where:

- $\beta_{1\text{-}3}$ = estimated parameters
- INDC (Individual characteristics), HHC (Household characteristics) and CV (community variables) = independent variables

3. Results and discussion

In this section the paper presents the study findings. Reported income portfolio activities were presented first followed their composition and the observed portfolio diversity. Econometric results for determinants of participation were presented last.

3.1. Rural income portfolio activities

This section focused on reported rural income portfolio activities from the study area. Figure 1 presents a graphical summary of the reported income portfolios. The distribution indicates that rural households from the study area derive their income from government support grants (58.56%) followed by salaries and wages (32.98%) as well as remittances (6.03%).

All these income portfolio activities are external income sources with an aggregate total household income share of 98%. Locally, the distribution indicates that households also derive some form of income from off-farm income portfolio activities (1.47%) and on-farm income portfolio activities (0.96%). These local income portfolio activities (off-farm and on-farm) have an aggregate total household share of 2% (Figure 1).

Similar comparable findings were forwarded by Machethe, (2004), Perret et al., (2005) and Davis and Pearce, (2001) who argued that, broadly, rural communities derive their incomes from on-farm activities, off-farm activities and transfers. The observed distribution from the study area therefore suggest a rural community largely surviving as beneficiaries of social grant aid from external sources – thus a perpetual dependence rural poor community (Bhagwati 2007; Mahlati 2009).

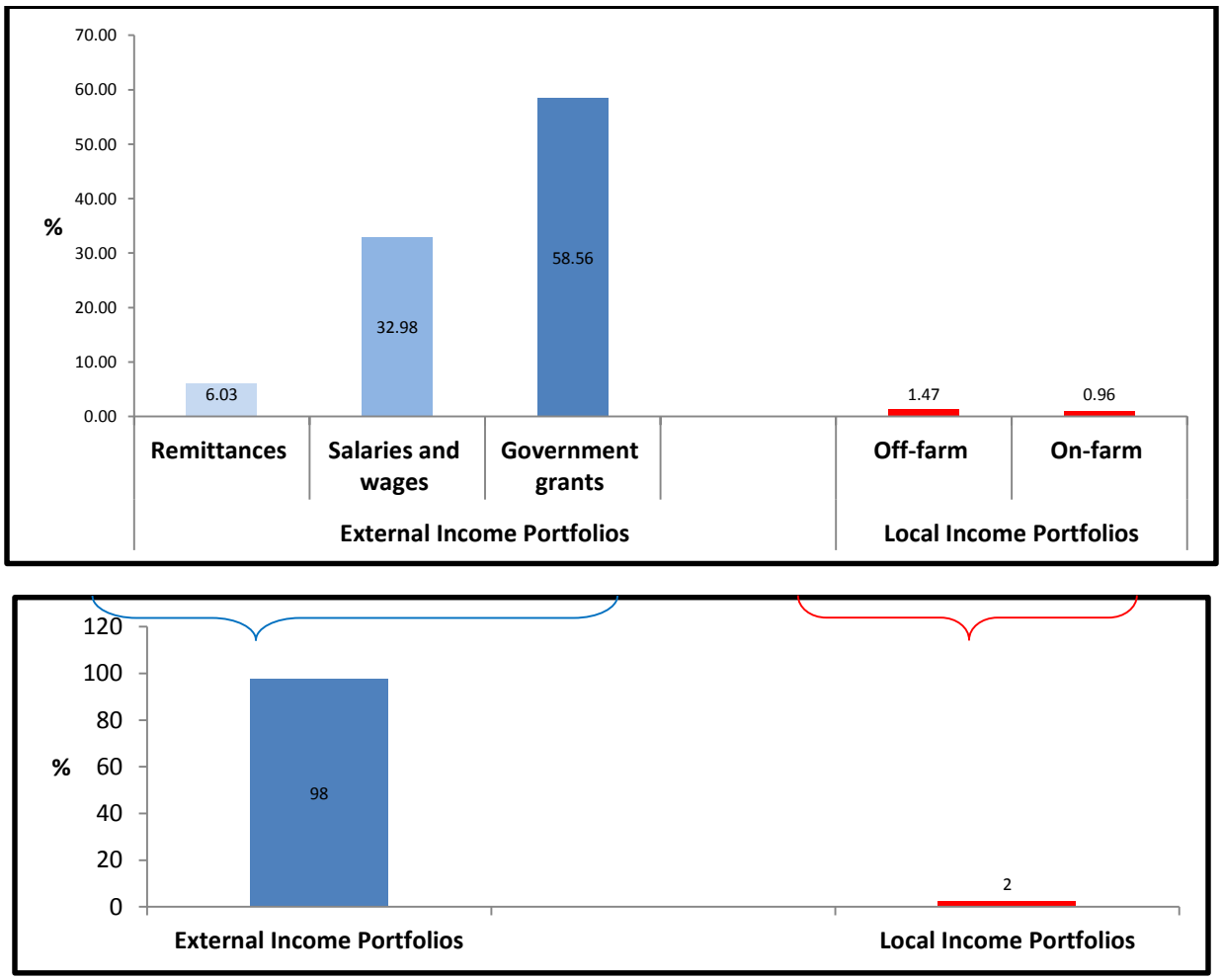

Figure 1. Distribution of rural income portfolios

The following section presents a detailed summary of the composition of various rural income portfolio activities.

3.2. Composition of rural income portfolios

In this section the paper unpacked the composition of rural income portfolios in a radar layout. Figure 2 presents the observed composition of rural external income portfolio activities. The observed distribution indicates that rural households from the study area derive a significant amount of their external incomes from salaries and wages (34%), old age pension (28%), and child support grant (24%). Fraser et al., (2003) and Perret et al., (2005) documented similar comparable findings in the following provinces of South Africa Eastern Cape, former homeland areas of Limpopo and North West. The observed distribution indicates that not much is however realised from disability grant, remittances, other government grants and child support from parent outside.

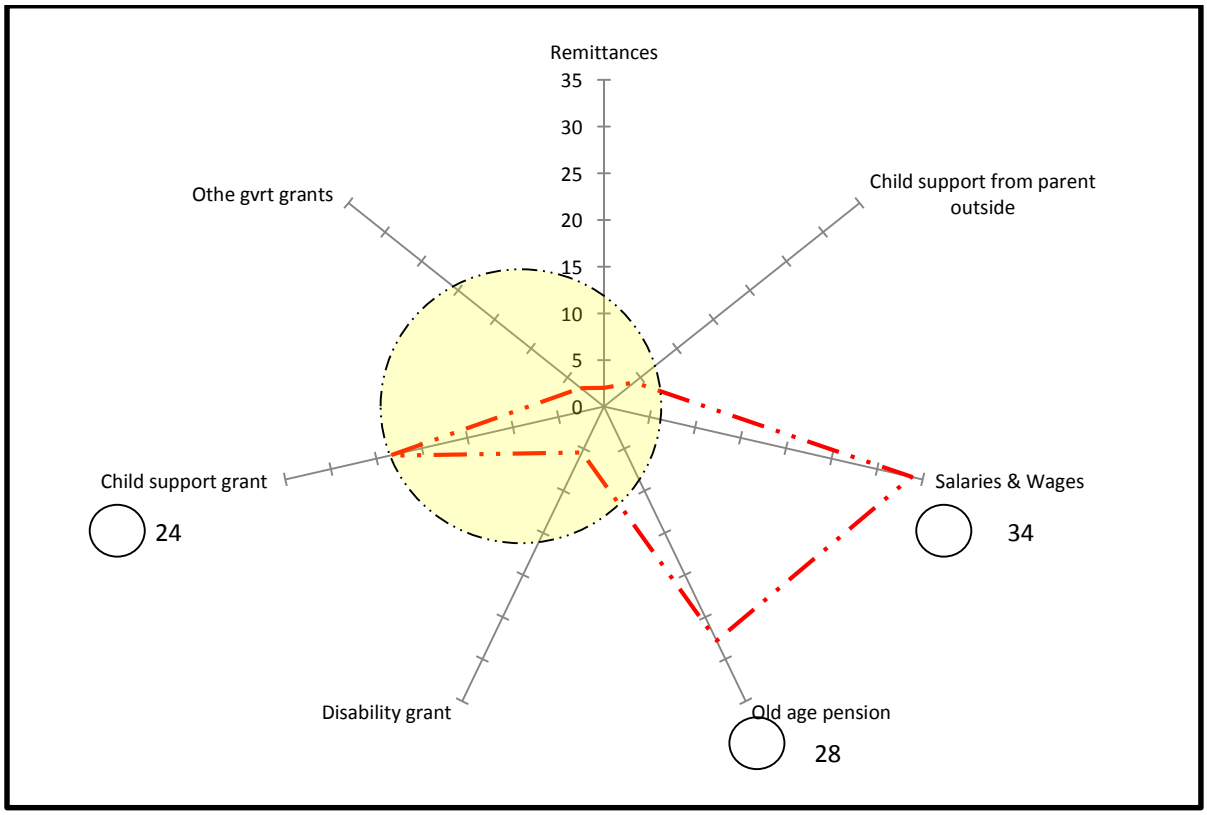

Figure 2. Composition of external rural income sources

With reference to internal income sources, Figure 3 presents the observed distribution. Although with a total household income share of only 2% as noted in Figure 1, the observed distribution indicates that internally, rural communities have several income portfolio activities namely: crop production (22%), lending money (20%), livestock production (18%), spaza shops (10%) and taxi businesses (10%). Hawking, building, selling liquor were some of the reported income generating activities pursued by rural households from the

study area. Lastly although not that distinct, plumping and carpentry were other income generating activities pursued by rural households from the study (Figure 3).

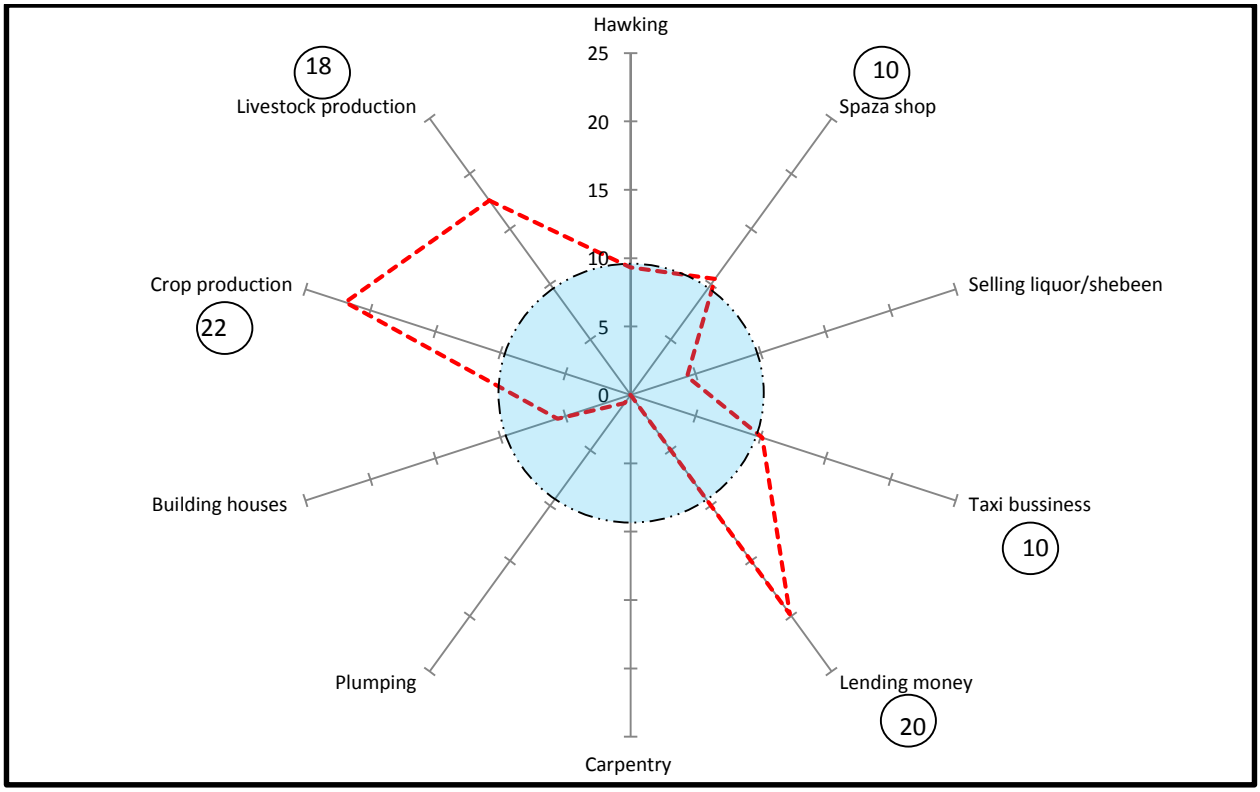

Figure 3. Composition of internal rural income sources

These findings suggest availability of several, income diversification options in most rural areas (Otsuka and Yamano, 2006) although their contribution to total household income may be low. The observed distribution suggests high potential in the development of rural micro-finance (lending money – 20%) and village/township enterprises in the following categories; spaza shops, tax business, hawking, building and selling liquor. Also, crop (22%) and livestock (18%) production holds promise as potential on-farm income activities in rural areas although not currently contributing significantly to total household income.

3.3. Diversity of rural local income portfolios among households

Figure 4 presents a graphical estimate summary of the observed internal rural income portfolio activity diversity. Results indicate a high level of low internal rural income portfolio activity diversity (98%), where the respondents were mainly engaged in almost nothing to a maximum of 2 local income generating activities.

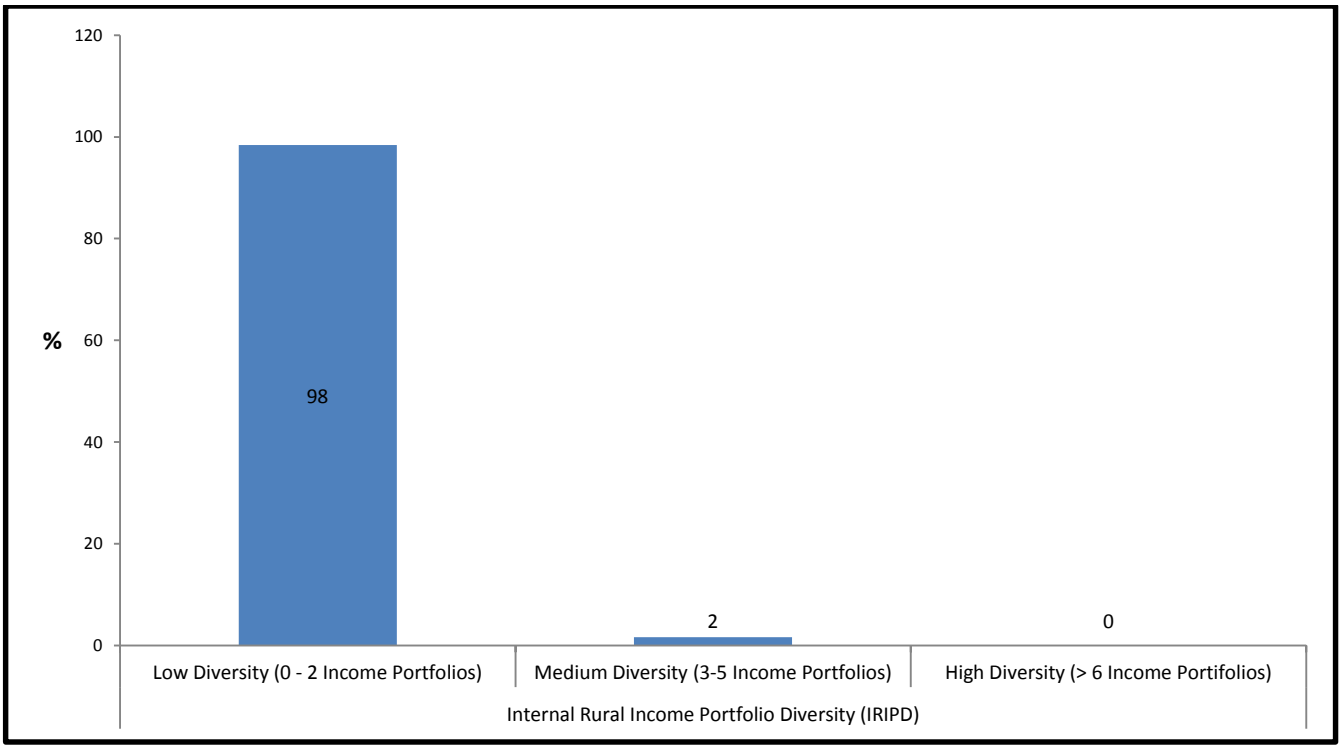

Figure 4. Internal rural income portfolio diversity

A few respondents (2%) were classified in the medium diversity category with 3 to a maximum of 5 local income generating activities. No one could be classified in the high diversity category (0%) from the study area an indication that could imply high income variability capable of lowering income levels and compromising consumption of households from the study area.

Rural households normally engage in multiple income generating activities (Reardon et al., 1992; Dercon, 2002) to smoothen their income and consumption (Senadza, 2012). Literature also suggests that a diversified portfolio of income-generating activities may be a way of minimising income variability as well as ensuring a minimum level of income (Alderman and Paxson, 1992). The observed low internal rural income portfolio diversity from the study area which could be emblematic to rural communities in Africa suggest entry barriers to local income portfolio activities worth understanding for policy targeting and further research.

4. Summary

Descriptive results suggest a rural community highly dependent on external social grants with minor reliance on local income generating activities. Several local income generating activities are however suggested to exist although not pursued by a majority of the rural community. The reported local income portfolios however present some opportunities in the development of rural micro-finance and village/township enterprises. Results further reveal a very low diversity in local rural income portfolio activities. Thus far, in the next section

the paper estimated the determinants of rural households` participation in local income generating activities for purposes of assessing potential opportunities and barriers to local income portfolio activity diversity.

5. Determinants of participation in local income generating portfolios

This section presents regression estimates for determinants of participation in rural local income generating portfolios. Regression analysis was conducted on the reported local income generating activities. These include; (a) livestock production (b) crop production (c) hawking, (d) spaza shop (e) selling liquor (f) taxi business (g) lending money and (h) building houses. The following *Nagelkerke* R^2 were obtained 0.54, 0.80, 0.72, 0.88, 0.57, 0.69, 0.77 and 0.63, indicating that more of the variation was explained by the models with overall prediction percentages of 63.1%, 78.0%, 90.0%, 95.2%, 64.5%, 77.8%, 80.3% and 91.7%, respectively, as shown in Table 1.

Results indicate a positive significant association between education and the following local income portfolio activities; hawking, taxi business, lending money and livestock production. Similar comparable findings were also earlier shared by several previous authors who noted a possible shift from on-farm to off-farm with improvement in education mainly in pursuit of better opportunities offered by off-farm activities (Ibekwe, 2001: Parasada, 2002: Bryceson, 2002; Davis, 2003; Sanchez, 2005; Ibekwe et al., 2010; Tasie et al., 2012).

Education may therefore be a barrier for most rural households as they try to participate in various local income portfolio activities in a bid to improve their income portfolio diversity capable of cushioning their livelihoods. Investing in rural education may be a strategic opportunistic window to link rural poor households into livestock production, micro-finance and village/township enterprises which can improve their local income portfolio diversity.

With reference to employment status, results indicate that employed households were more likely to participate in the following local income portfolio activities compared to their non-employed counterparts; spaza shop, selling liquor, taxi business and livestock production. These income portfolio activities require initial injection capital, a significant factor that may exclude a majority from the unemployed category. These findings reinforce the significance of income as a prerequisite in rural households' participation in livestock production and investment in village/township enterprises. Policies that address access to disposable rural income may be an opportunity to stimulate diversity in rural income portfolios.

Results also reveal a positive link between household size and the hawking portfolio and a negative link with respect to the lending money portfolio. These findings suggest that a large household size may have a higher probability of participating in hawking activities possibly as a result of more labour units which is critical under hawking activities. The observed negative association with respect to lending money portfolio suggests inability of large household sizes to serve enough disposable income for purposes of money lending activities.

Table 1. Determinants of participation in local income portfolio activities

Predictor Variables		**Reported rural local income generating portfolios**							
		Hawking	Spaza shop	Selling liquor	Taxi business	Lending money	Building houses	Crop production	Livestock production
Constant		-5.399 [0.000]	-3.432 [0.000]	-5.849 [0.000]	-26.010 [0.535]	-34.512 [0.641]	-3.087 [0.030]	-5.061 [0.000]	-7.758 [0.000]
Education	β1	.156 [0.047]*	-.042 [0.451]	-.002 [0.976]	.331 [0.003]**	1.047 [0.015]*	-.012 [0.874]	.074 [0.158]	.139 [0.022]*
Employment status	β2	.095 [0.880]	.604 [0.040]*	.689 [0.015]*	.795 [0.004]**	.496 [0.568]	-.217 [0.796]	.366 [0.233]	.587 [0.015]*
Time at home	β3	-.742 [0.350]	.020 [0.975]	.943 [0.371]	17.335 [0.996]	15.714 [0.996]	-.143 [0.902]	.660 [0.391]	1.447 [0.165]
Household size	β4	.461 [0.001]**	-.030 [0.891]	.068 [0.798]	.088 [0.812]	-.374 [0.036]*	-.548 [0.103]	.027 [0.904]	.125 [0.574]
Active population	β5	-.159 [0.589]	.638 [0.037]*	.219 [0.530]	.127 [0.756]	.821 [0.463]	1.092 [0.001]**	.183 [0.468]	.131 [0.607]
No. of children	β6	-.457 [0.029]*	.117 [0.613]	.134 [0.632]	-.077 [0.847]	.915 [0.007]**	-.048 [0.816]	-.080 [0.749]	.056 [0.818]
Extension	β7	-.259 [0.381]	-.738 [0.144]	-.283 [0.505]	.054 [0.919]	-.321 [0.769]	-.581 [0.124]	-.149 [0.648]	-.056 [0.864]
Gender	β8	-.358 [0.000]**	.732 [0.014]*	-.619 [0.043]*	.421 [0.174]	.074 [0.035]*	.487 [0.212]	-.342 [0.021]*	0.522 [0.041]*
Chi-Square (df = 8)		22.561	33.554	28.145	24.498	15.041	20.003	38.258	18.241
(-2)Log Likelihood		173.462	192.234	184.251	176.845	170.852	160.885	184.231	166.232
Accuracy of prediction; Overall (%)		63.1	78.0	90.0	95.2	64.5	77.8	80.3	91.7
Nagelkerke R^2		0.54	0.80	0.72	0.88	0.57	0.69	0.77	0.63
Notes: *** and * indicates significance at 0.01 and 0.05 probability level respectively; p-value in [] brackets*									

A positive association between active population (15 – 64 years) and the following portfolios was confirmed; spaza shop and building houses. These findings suggest a significant role of availability of family members aged between 15 and 64 within a family towards participating in spaza shops and building of houses. With respect to building houses the role of active population may be to supply labour force which is pivotal in such activities.

Results also reveal a negative association between number of children and hawking and a positive association with respect to lending money. These findings indicate the influence of the child support grant on hawking and lending money portfolios. More number of children may imply more child support grant which may discourage participating in hawking activities (low return) but rather promote participation in lending money activities (high return).

Lastly, gender was negatively associated to the following portfolios; hawking, selling liquor and crop production meaning such activities where more of a female activity from the study area. A closer look into these activities would reveal that they are labour intensive, loosely define food security issues at household level and generally bears low returns. Women in Africa are normally associated with such activities. Contrary, gender was also positively associated to the following portfolios; spaza shop, lending money and livestock production, suggesting that such activities were more of a male domain from the study area. These activities are normally associated with males as they generate high returns and high risk.

6. Conclusion

The paper estimated rural income portfolios, compositions, diversity and determinants of participation in rural local income portfolios. With reference to rural portfolios, the paper revealed that rural households from the study area derive their income from government support grants followed by salaries and wages as well as remittances with minor contribution from local on-farm and off-farm activities. External rural income portfolio compositions were dominated by salaries and wages, old age pension and child support grant. For internal rural income portfolio compositions, the following were distinct; crop production, lending money, livestock production, spaza shops and taxi businesses. The paper also concluded that households from the study area had very low local income portfolio diversity suggesting entry barriers. Lastly, education, employment status, household size, number of active population, number of children and gender emerged as significant determinants of participation in various local income portfolio activities worth targeting to address the observed low income portfolio diversity.

7. Policy insights

The above results generate some policy insights that can be pursued to create and support rural markets (financial, input and product markets) which are reported to be missing in rural areas of most African countries. We therefore coin policy insights under the concept of (a) Making Markets Work for the Poor (MMWP) and (b) Using Markets to Drive Rural Development (UMDRD).

7.1. Creation of rural financial markets (money lending)

Figure 3 revealed a significant number of local communities participating in lending money activities. These findings suggest availability of demand for cash from a rural setting which commercial banks are currently unable to fulfill. Regression results in Table 1 reveal some associations between participating in lending money and the following socio-economic attributes of households; education, gender, number of children (access to child grant) and household size. Policy, research and investments in understanding and designing rural

financial market models (micro – finance) inspired by the observed associations may go a long way towards addressing issues of missing financial markets in rural areas.

7.2. Creation of village/township enterprises (to house local input and product markets)

Spaza shops, selling liquor, taxi business, building houses were also key income portfolios pursued by respondents from the study area. Several socio-economic attributes were revealed to be instrumental in conditioning participation in such activities. These activities define possible village/township enterprises key in developing rural input and product markets. Policy, research and investment centered on developing strategic rural driven input and out markets inspired by socio-economic attributes of local communities may also go a long way in addressing sustainable rural input and out markets.

7.3. Promoting crop and livestock production (through local market forces)

Crop and livestock production were significant income portfolios from the study area also conditioned by several socio-economic attributes of households to include education, gender and income. Creation and promotion of rural markets (financial, input and product) may be in a position to boost local rural crop and livestock production; through unlocking local finance (micro-finance; money lending) and local input and product markets (village/township enterprises; spaza shops, hawking, selling liquor).

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