

DWINDLING OPPORTUNITIES FOR EXTERNAL MIGRATION: IMPACT ON RURAL
HOUSEHOLD INCOME IN LESOTHO

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ABSTRACT

In spite of its many shortcomings, households in rural Lesotho have for over a hundred years seen the migrant labour system as an important source of income. At its peak in the early 1970s, it employed some 200,000 Basotho men from a population of less than two million. But the number of Basotho in the South African mines has declined from almost 126,000 in 1990 to just over 45,000 in 2009. Using primary data, this paper analyses the sources and levels of income in three household types in rural Lesotho – former migrant, current migrant and non-migrant households – and then identifies the variables that significantly correlate with both household income and household per capita income. In the absence of panel data, the paper uses the differences in the average incomes between current and former migrant households to speculate on the impact of dwindling opportunities for external migration on migrant-household income. Finally, drawing on the marginal productivity theory of employment, the paper demonstrates that the declining numbers of Basotho migrant mine workers may be an indication of the imminent demise of the Southern African migrant labour system and so recommends policy intervention for training and job creation for productive engagement in the domestic economy of rural men who have traditionally found employment in the South African mines.

Key words: migration, rural economic activities, rural household income
JEL Classification: J21, J61, J64; O22; M11

0. INTRODUCTION

Data on the numbers of Basotho migrant mine workers in South Africa show a decline from 126,000 in 1990 to just over 45,000 in 2009 (Central Bank of Lesotho, 2000: 48; 2005: 75; 2010: 63; Mensah 2010: 165). This persistence of dwindling opportunities for migration to the mines in South Africa is referred to in this article as migration shocks. If the migration of rural Basotho men to the mines in South Africa were driven mainly by unemployment in the domestic economy, then it may be hypothesised that there is no significant difference between the incomes of former migrant, current migrant and non-migrant households that have bread winners, and so the return of migrants from the mines should not cause significantly difference in the average income of the three household types in rural Lesotho. This paper identifies the sources of income for the three household types and the variables that significantly correlate with both household income and household per capita income. It then estimates the average incomes for the three household types, and uses the differences in the average incomes to speculate on the

impact of dwindling opportunities for migration to the South African mines on incomes in migrant households.

The dynamics that a panel data set presents make such data ideal for determining the impact of dwindling opportunities for migration on incomes in former migrant households. With panel data, the impact of migration shocks on incomes in former-migrant households would be given by the difference between incomes during and after migration. But, in the absence of panel data, the impact of migration shocks was estimated from the cross-section data available by comparing mean income in former-migrant households with that in current-migrant households.

This paper makes a contribution in two main areas: first, it provides evidence that the declining numbers of Basotho in the South African mine is not a transitory phenomenon that may soon be corrected by market forces and so recommends policy intervention for training and job creation for the tens of thousands of rural men who have traditionally found employment in the mines for well over a century; second, it estimates the magnitude of the impact of migration shocks on the household income of migrants in rural Lesotho, which then give an idea of their welfare implications.

Both primary and secondary data are used in this paper. Primary data were generated from a survey of households conducted during December 2006 and January 2007 (Mensah, 2010). Though 208 households were interviewed in the rural areas of the four western lowland districts and one mountain district, complete information was available for the 150 households reported in this paper. Because of the focus on three groups of households, a combination of stratified and systematic sampling with a random start would have been ideal for the study. However, because of the nonexistence of a sampling frame, the research design employed was a combination of purposive sampling, cluster sampling and systematic sampling with a random start (Babbie, 2004: 205-206; Burton 2000: 310).

The rest of the paper is divided into five sections: section I reports the sources of income in rural Lesotho and section II uses regression analyses in identifying the key determinants of rural household income. Section III estimates the impact of dwindling opportunities for external

migration and thus highlights the declining income and welfare levels in former migrant households. Section IV draws on the marginal productivity theory of employment in arguing that the declining numbers of Basotho migrant mine workers is an indication of the imminent demise of the Southern African migrant labour system and so may not be transitory. Section V concludes with suggestions for employment generation in Lesotho comparative advantage areas of tourism and handicraft, inland fishing in the Katse and Mohale dams, winter cropping under irrigation in the Senqu River valley.

I. SOURCES OF INCOME IN RURAL LESOTHO

Lesotho's rural areas comprise 75% of the country's population and yet the economic base of the rural sector (i.e. agriculture) is not only weak but also deteriorating (Mensah, 2010: 22). Furthermore, in spite of its contribution to the country's fairly high growth rates, the urban sector is not generating employment at levels that will put downward pressure on urban unemployment. (Mensah, 2010: 53-65) Therefore, as they are presently structured, both the formal and informal sections of the urban sector cannot play a significant role in absorbing the thousands of returning migrant mine workers that are added to the country's labour force annually. This is the motivation for the focus in this section on the rural areas – with a view to suggesting improvements in their employment-generation capacity.

Rural economic activities are usually rural-resource based: arable land for crop farming (which is scarce in Lesotho because of alienation and the topography), range land for raising livestock (which is also under pressure from overgrazing), and wild grass for handicrafts, including thatched roofing (which may be underutilised). One rural resource that is definitely underutilised within Lesotho for rural economic activity is water from the Katse and Mohale dams – for irrigation cropping, (especially profitable cultivation of winter crops like wheat and Swiss chard, since winter is the dry season in Lesotho), fish farming, and tourism (with all the construction, recreation, pleasure and hospitality activities that go with it). Turner (2001: 17) listed the following main economic activities in the rural areas of Lesotho: raising livestock for sale, for draught power, wool and mohair; crop production; owning and operating small businesses such as cafes and milling machines; owning and operating vehicles for transport; brewing and selling

local beer and/or bottled beer; and even growing and selling dagga¹. Though for obvious reasons none of the households in this study mentioned dagga production as a household economic activity, it is significant that Turner did. From a purely economic point of view, growing dagga in the arable-land-scarce remote areas of Lesotho, where policing farmers would be difficult, if not virtually impossible, might be seen as optimal behaviour in land use because the very high street and, therefore, farm-gate value of the crop, compared to others, gives high returns to the scarce resource – land. Migration shocks could therefore drive many desperate returning migrant mine workers into dagga production – ethics aside. The social cost to societies of dagga on the streets is a good enough reason for helping ex-migrant households in rural Lesotho to establish themselves in viable, socially beneficial, and legal economic activities so as not to find production of dagga attractive.

Tables 1, 2 and 3 below give the economic activities mentioned by households in rural Lesotho as sources of income. Because of their relationship to each other, the three tables are discussed together instead of sequentially. Corroborating the findings of other investigations into economic activities in the rural areas of Lesotho (Sechaba Consultants, 1995: 100, 167; Turner, 2001: 30, 53, 55), Tables 1 and 4 show that, in terms of both numbers of households that depend on the various sources and the amounts derived from them, remittances from migrant mine workers are the single most important source of income for rural households. Since almost 75% of the population lives in the rural areas, the dominance of remittances among sources of income in rural Lesotho makes migration, not agriculture, the backbone of Basotho households – and income vulnerability to migration shocks a really serious concern. In terms of household involvement, agriculture – animal husbandry (especially cattle) and crop production (maize being the staple food crop) – is the second largest economic activity in rural Lesotho.

Though 39% of the households have livestock (cattle) – and some have large herds – this does not usually generate immediate economic benefits. Generally, in cattle cultures, the size of a household's herd is directly related to the prestige of the household in the community, which makes having a large herd the goal for many households. Consequently, households that have

¹ Dagga is a Southern African term for marijuana. Because production and sale of dagga are illegal, data do not exist on production levels. However the remote mountain areas in Lesotho could provide safe havens for dagga production.

small herds of cattle usually do not use their cattle to generate income through sales (Q004, Q019, Q040, Q043, Q075: 2.2, 4.11)². Also, a respectable household must have a choice animal in its kraal for that special family or festive occasion when slaughtering a cow or bull is required by tradition. Because even households that have fairly large herds of cattle and flocks of sheep and goats (Q051, Q081, Q131: 2.2, 4.11) may hardly sell some to generate income on regular basis, there are households with large cattle herds that live in relative poverty – by international standards. Some 19% of households keep livestock other than cattle (such as sheep, goats and pigs) and 15% have poultry. The proportions of the three household types that own different kinds of livestock are given in Table 2. Some of the households have only a couple of sheep and/or goats and/or pigs and often a similar small number of chickens that are raised on free range, and most of them keep such livestock and/or poultry more as a delightful hobby than as an income-generating activity. (Q005, Q099, Q106: 2.2, 4.11) The often un-acclaimed economic value of micro-scale poultry is realized through eggs and meat used by the household and the windfall that comes with occasional sales – especially of cockerels. Gains from raising small numbers of sheep/goats/pigs come in a similar manner.

Some households have enough numbers of a variety of livestock for their holdings to constitute a serious economic enterprise (Q002, Q033, Q100, Q126: 2.2, 4.11) and others have reasonably large poultry flocks. (Q024, Q042: 2.2, 4.11) Yet, as mentioned earlier, in Lesotho a household's herd of cattle is seen more as a prize item – like possession of a diamond – than as a source of income, which helps in explaining Lesotho's problems of over stocking and over grazing, and the accompanying loss of arable land through erosion and gully formation.

² The format adopted for citation from the questionnaire used for the December 2006/January 2007 Survey is: household/questionnaire number, in this case, for example, Q019 or Q040, etc., followed by a colon, and then the number of the question(s) of the questions the answers to which have been cited (e.g. Questions 2.2, 4.11 in this example).

Table 1: Reported sources of income in rural households

Sources of income (economic activities)	No.	%
Cattle herding	4	3%
Domestic worker	15	10%
Employment (Government)	19	13%
Employment (other)	26	17%
Farming (cereal) ¹	49	33%
Farming (Vegetables)	56	37%
Government pension	1	1%
Hawking	6	4%
House rental	3	2%
Livestock (cattle)	59	39%
Livestock (other)	29	19%
Piece job (casual labourer)	2	1%
Poultry	22	15%
Remittances (mining)	74	49%
Remittances (non-mine)	13	9%
Retail trade (Small shop, telephone booths, etc.)	5	3%
Self-employment (skilled) ²	14	9%
Taxi driver/conductor	10	7%
Transport	4	3%
No. of households ³	150	100%

Source: Compiled from December 2006-January 2007 Household Survey

1. Farming (cereal) refers to cultivation of maize, sorghum, etc.
2. 'Special skills' include brewing, herbalist work, tailoring, rope making, building, etc.
3. Percentages will not add up to 100% because households could be involved in several activities.

The former migrant category seems to have the highest proportion of households with some type of livestock; and they also top the groups in the 'cattle only' and 'livestock – several kinds' categories. The traditional view that livestock, especially cattle, is a household's stock of wealth that must be increased for the next generation could, therefore, place former migrant households in a unique situation: they have lost their remittance income and though they sit on wealth, they could still be living in poverty because their wealth is not allowed to generate income. Alternatively, former migrant households could be the group that could start changing the traditional view by taking cattle rearing as a business that generates regular income for the

household. A catalyst that could speed up the transition is, ironically, the usually conservative body of chiefs – in view of their control over land. Chiefs could facilitate the change to the view that livestock should be an income-generating asset by charging a fee for grazing in the commons when a household’s livestock exceeds a certain threshold. On the one hand, grazing fees would force households to regularly generate income from their livestock, which could intuitively restrict their herd to the size where marginal returns from sales approximately equal marginal cost of raising livestock.³ And on the other hand, the funds raised through grazing fees could be used for environmentally beneficial land resuscitation – re-vegetation, filling of gullies, terracing, etc. Commonly held concerns about land degradation, soil erosion, gully formation, etc., should be the motivation for chiefs to impose grazing fees.

Table 2: Households’ farm and livestock holdings - by migration status

Type of livestock	NMH		FMH		CMH	
	No.	%	No.	%	No.	%
Farm(s) (crops)	12	39%	19	59%	28	32%
No livestock ¹	16	52%	9	28%	44	51%
Poultry only	3	10%	2	6%	7	8%
Cattle only	2	6%	7	22%	18	21%
Sheep/goats only	1	3%	2	6%	0	0%
Pigs only	3	10%	2	6%	2	2%
Livestock - several kinds ²	5	16%	10	31%	16	18%
Horses	7	23%	2	6%	13	15%
Donkeys	1	3%	2	6%	15	17%
No. of households	31	100%	32	100%	87	100%

Source: Compiled from December 2006-January 2007 Household Survey

1. ‘No livestock’ means households do not have cattle, sheep/goats, pigs and poultry.
2. ‘Livestock – several kinds’ means households have two or more kinds of livestock.

³ Many business people intuitively apply this principle in their businesses without the benefit of formal study of economics, much like the method of production in the pin factory that Adam Smith observed and used in propounding his theory of division of labour, specialisation and efficiency, which is proof that experience is often the best teacher of such basic principles of economics.

Judging by the proportion of households directly involved, crop production is second only to cattle rearing in Lesotho’s agriculture (Table 1). Analysis of crop production data however reveals a downward trend in both yield and output since 1997/98, with 2000/01 being exceptionally good for maize and sorghum (Mensah 2010: 20-22). Also, as noted above, the numbers of Basotho migrant mine workers declined by 64% between 1990 and 2009. The high proportion of former migrant households engage in crop production – almost 60% in Table 2 – may therefore suggest that many returning mine workers have been turning to farming. A similar observation has been made by Sechaba Consultants (2000: 38) The declining yield and output in crop production may be evidence of diminishing returns as thousands of former mine worker engage themselves in the arable portions of Moshoeshoe’s “narrow strip of land” (Omer-Cooper, 1987: 97). This suggests an urgent need for adoption of productivity enhancing techniques for the major crops to cushion income vulnerability to migration shocks. This could include the use of high-yielding seeds, environmentally friendly (organic) fertilizers and conservation.

Table 3: Household non-farm businesses in rural Lesotho - by migration status

Type of business	NMH		FMH		CMH	
	No.	%	No.	%	No.	%
Builders	2	6.5%	1	3.1%	0	0.0%
Electricians	1	3.2%	0	0.0%	0	0.0%
Farm equipment rental	0	0.0%	0	0.0%	1	1.1%
Hawking	1	3.2%	1	3.1%	0	0.0%
House rental	1	3.2%	1	3.1%	1	1.1%
Mechanical workshop	0	0.0%	2	6.3%	0	0.0%
Retail trade (exc. Telephone)	0	0.0%	1	3.1%	1	1.1%
Telephone booth	0	0.0%	1	3.1%	2	2.3%
Transport	1	3.2%	0	0.0%	2	2.3%
Welding	1	3.2%	1	3.1%	0	0.0%
Self-employment (skilled) ¹	4	12.9%	2	6.3%	0	0.0%
No non-farm business ²	26	83.9%	27	84.4%	81	93.1%
No. of households ³	31	100.0%	32	100.0%	87	100.0%

Source: Compiled from December 2006-January 2007 Household Survey

1. ‘Self-employment (other skills)’ includes brewing, herbalist work, tailoring, rope making, building, etc.
2. Poultry farms are considered farm business so households with only poultry are included here.
3. Percentages will not add up to 100% because households could be involved in more than one activity.

The proximity of many rural communities to urban and peri-urban centres, especially in the Maseru and Leribe districts, provides opportunities for various types of employment for many rural residents (Table 1). A striking feature of Table 1 is the proportionately smaller numbers who are engaged in small business, e.g. retailing, transport, or house rental, or who employ themselves in skilled work. The breakdown of economic activities in Table 3 shows that the greater proportions of the households, especially current migrant households, do not have any non-farm source of income. None of the current migrant households have skilled workers. These facts – and the evidence in Table 2 that current migrant households rank the lowest in farm ownership, which is why they tend to depend almost exclusively on remittance income – increase the income vulnerability of current migrant households from migration shocks. In fact, many current migrant households of both the mine (Q006, Q007, Q008, Q030: 2.2, 4.11) and non-mine (Q009, Q010: 2.2, 4.11) categories live on only remittances, which makes them most vulnerable. This corroborates the observation of Sechaba Consultants (1995: 101) that the result of retrenchments from the mines “has been increased hardship for many of the families who depend on migrant remittances for much of their income.” Also, as the lifecycle theory would predict, it is usually households of younger migrants that tend not to have a farm, livestock or business enterprise (Q142, Q143, Q144, Q147, Q150: 4.5, 4.11) and therefore that is most at risk.

There are, however, current migrant households that have “multiple livelihood strategies” (Turner, 2001:55), with income from remittances, crop production, and employment of migrant’s spouse or other household members as domestic workers, shop assistants, teachers, nurses, secretaries, among others (Q001, Q027, Q028, Q031, Q036, Q123: 2.1III, 2.2, 4.11); but such are the exception. The paucity of trade and entrepreneurial skills noticeable in Table 3 gives an indication of the role training in skills and entrepreneurship could play in helping returning mine workers to create income-generating niches for their households in rural Lesotho, especially in the service occupations.

The list of economic activities (Table 1) does not include possibilities in the handicraft industry. Handicraft displays in and around the hotels in Maseru and in some gift shops provide evidence of Lesotho's potential comparative advantage in that industry. Most items of Basotho handicraft, including the popular Basotho hat and Basotho thatched roofs, are made from grass or other non-consumption harvests from the fields and forests. For the most part, skills in handicraft are either passed down in the family or learnt by observing others; not much effort is made to formally teach handicraft skills in schools and colleges to encourage self-employment. Training in handicraft in schools and colleges, especially those in the rural areas, and creating market access for Basotho handicraft outside Lesotho could modernise the industry, increase employment and income in rural areas, and thus improve rural welfare. With handicraft skills sensitive and perceptive minds, nourished over time with the rustic and pastoral scenes from Lesotho's beautiful surroundings, will produce great works of art and craft that could penetrate global markets and increase rural income in Lesotho.

II. DETERMINANTS OF RURAL HOUSEHOLD INCCOME LEVELS

The task in this section is divided into two parts: first, to find the extent to which economic activities by household members determine household income and its distribution across household types; and, second, to use regression analysis to identify variables that significantly correlate with individual and household incomes. The objective here is not to conduct a detailed and rigorous econometric modelling of the income function, but rather to identify variables that significantly correlate with individual and household income and that could therefore shed light on the impact that migration shocks may have on individual and household income. The survey data described in sections 6.1 and 6.2 were used for the analyses in this section. Data collected on individual characteristics include age, years of schooling, employment status, current migration status, years of work, migrant years, current income, etc.; and at the household level, data on household income, size of house (i.e. number of rooms), size of household (number of persons), ownership of fields and livestock, access to remittance and deferred payment from members working in South Africa, etc., were provided.

Economic activities performed by members of the three types of households have been grouped into two main categories: participation in a foreign labour market as migrants and participation in the domestic labour market. Further, economic activities in the domestic labour market are put into four employment groups: government, private-sector, agricultural activity – as employee or entrepreneur – and non-agricultural business (mainly as entrepreneur). The columns in Table 4 summarise the distribution of the income derived from each type of economic activity. Table 4 has one important limitation: participation in and income from agriculture are likely to be underreported by all the three types of households, but especially migrant households because of ‘the concept of work’ in rural Lesotho – household members particularly women and adult children engaged in subsistence agriculture do not consider themselves, nor does their society consider them, to be working and contributing to household income. The value of their contributions is therefore not included in Table 4.

The reported number of income-earning adults in Table 4 is 254: 54 (or 1.74 per household on average) in non-migrant households, 51 (1.59 per household) in former migrant households, and 149 (1.71 per household) in current migrant households. The 1.74 income earners per household in non-migrant households are engaged in government employment (0.26), private sector employment (0.84), agriculture (0.45), and in non-agricultural business (0.19). Similarly, the 1.71 members reported as earning income from domestic economic activities in current migrant households are spread into 0.09 in government employment, 0.38 in private sector employment, 0.05 in agriculture, and 0.13 in non-agricultural business. So, in terms of earning income within Lesotho, representation of current migrant household members is the least; former migrant household members fall between non-migrant household members and current migrant household members, except in agriculture where they dominate.

Table 9.4: Sources and levels of household income - by household type

Income group	Migrant work	Government employment			Private employment			Agriculture			Non-agriculture		
		NMH	FMH	CMH	NMH	FMH	CMH	NMH	FMH	CMH	NMH	FMH	CMH
10000+	1												
9000-9999													
8000-8999											1		
7000-7999													
6000-6999													
5000-5999	3	1											1
4000-4999	7	1											1
3000-3999	32	2	1	3									
2000-2999	28	2	3	1	2	2	2	2			1		
< 2000	22	2	2	4	24	20	31	12	17	4	4	6	9
Total	93	8	6	8	26	22	33	14	17	4	6	6	11
No. Hhds	87	31	32	87	31	32	87	31	32	87	31	32	87
Ave	1.07	0.26	0.19	0.09	0.84	0.69	0.38	0.45	0.53	0.05	0.19	0.19	0.13

Source: Compiled from December 2006-January 2007 Household Survey (Mensah, 2010)

The distributions of income within the different economic activities listed in Table 4 also highlight the income vulnerability of current migrant households to migration shocks. While migrant households have a strong showing in the M2000–M5999 monthly middle-income range, they are generally among the low-income groups in economic activities within Lesotho.

The second part of this section uses regression analysis to identify variables that significantly correlate with individual and household income and could therefore be used in designing policies to temper the adverse effects of migration shocks on former and current migrant households. The five-number test, the box and whiskers plot and the skewness⁴ test all showed that most of the variable are reasonably symmetrical, which is a basic assumption for the least squares

⁴ Perfectly symmetrical distributions have a coefficient of skewness of zero, but in practice a distribution with a coefficient of between +3 and -3 is considered normal. (Freund et al, 1993: 87)

method of linear regression. The outliers⁵ in Table 4 will “unduly affect the description of the sample distribution” (i.e. the sample distribution of income will have a large mean and a large variance that will make sample estimates of income inefficient) (Newton and Rudestam, 1999: 168). Normally a box and whisker plot and/or residual plots are used to identify the unusual data points. To determine its influence on the estimated equation, it is excluded, the regression re-run and the two results compared (Cryer and Miller, 1994: 195-198). But, since the objective here is to identify variables that significantly correlate with income rather than produce out-of-sample forecasts for values of income, the details of correcting for the effects of the outliers – i.e. taking their leverage into account – will not be carried out.⁶

In what follows, effort is made to identify the variables that correlate with income of workers, household income and per capita income, remittances, and savings. The general-to-specific estimation technique, starting “with a broadly specified overarching model which contains within it several feasible specifications that depict [alternative] explanations” is used (Mukherjee et al., 1998: 33-35).

On income of individual workers, it is hypothesised that this will correlate with their human capital variables such as years of education, training, and years of work experience (which could be a proxy for effort and productivity); age is included as a life-cycle variable. This gives the model specified in equation 1.

$$\begin{aligned} \text{CURRINC} = & \beta_0 + \beta_1\text{EDUYEARS} + \beta_2\text{VOCTRNG} + \beta_3\text{YRSWEKD} \\ & + \beta_4\text{MIGTYRS} + \beta_5\text{AGE} + \varepsilon \end{aligned} \quad (1)$$

where CURRINC is current income, EDUYEARS is years of schooling, VOCTRNG, is vocational training, YRSWEKD is years worked, MIGTYRS, is years of migrant work, and AGE is age of individual.

⁵ “An outlier in a regression relationship is a data point with an unusual value”, usually “more than three standard deviations from the mean” (Baum, 2006: 126; Newton and Rudestam, 1999: 169)

⁶ In this case the most extreme data point represents the income of a Mosotho geologist in the mines who earns more than six times the average wage of unskilled miners. The next extreme point is a successful small-scale business man.

The estimated equation for the model in equation 9.1 for all adults is given in Table 5.

Table 5: Determinants of individual incomes - all adults

CURRINC	Coefficient	Std. error	t-ratio	P > t
EDUYEARS	122.63	29.630	4.14	0.000
VOCTRNG	819.35	245.270	3.34	0.001
YRSWEKD	45.31	13.063	3.47	0.001
MIGTYRS	7.95	9.800	0.81	0.418
AGE	0.45	10.924	0.04	0.967
CONST	-585.27	511.991	-1.14	0.254

F(5, 395) = 9.65
 Prob > F = 0.000
 R-squared = 0.1185
 Adj R-squared = 0.1062
 Number of obs = 365

Even though the R^2 and adjusted R^2 values in Table 9.5 are very low, which is not uncommon in studies of this type that are based on cross-section data (Lucas and Stark, 1985; Adams, 1993), the F-test shows that the variables in the model collectively significantly explain income. The results also shows that all the explanatory variables in the model have the expected signs – i.e. they correlate positively with income – but only education, vocational training and work experience are very significant (i.e. at the 1% level).

The broad specification of the model for household income has the key variables that could influence household income from the neoclassical and lifecycle perspectives. It is hypothesised that human capital endowments and other assets of households, together with household average age and age of household head influence household income. The model is given in equation 2.

$$\begin{aligned}
 \text{HHINC} = & \beta_0 + \beta_1\text{EDUAVEAD} + \beta_2\text{HHAGE} + \beta_3\text{HHHAGE} + \beta_4\text{VOCTRNG} \\
 & + \beta_5\text{HHCATTLE} + \beta_6\text{HHFAMSIZ} + \beta_7\text{MIGSTATUS} \\
 & + \beta_8\text{PROMEN18/ HHADULTM} + \beta_9\text{HHYRSWEK} + \beta_{10}\text{HHMIGYRS} + \varepsilon
 \end{aligned}
 \tag{2}$$

where HHINC is household income, EDUAVEAD average years of schooling for adults in a household, HHAGE the average age of the household, HHHAGE the age of the household head, VOCTRNG vocational training, HHCATTLE the size of the household herd of cattle, HHFAMSIZ the number of household plots of farms, and PROMEN18/HHADULTM is the proportion/number of adult males in the household.

Two observations should be made here. First, adult females are excluded from equation 2 because, as explained earlier, in rural Lesotho they are often presented as “housewives” or “unemployed” and so their contribution to household income is generally not acknowledged. Second, Mensah (2010:) observed that current migrant households tend to have more adult males than the other types of households, so both the proportion and the number of adult males in the household is used (alternatively) in equation 2 and the fits compared.

The estimated parameters and test statistics for the model in equation 2 (with the number of household adult males) are shown in Table 6.

Table.6: Determinants of household income - all households

HHINC	Coefficient	Std. error	t-ratio	P > t	
EDUAVEAD	132.65	47.22	2.81	0.006	F(10, 133) = 5.81
HHAGE	4.3	16.42	0.26	0.794	Prob > F = 0.000
HHHAGE	-10.41	17.57	-0.59	0.555	R-squared = 0.3040
VOCTRNG	-181.7	297.10	-0.61	0.542	Adj R-squared = 0.2517
HHCATTLE	13.16	34.21	0.38	0.701	Number of obs = 144
HHFAMSIZ	-8.41	73.01	-0.12	0.909	
MIGSTATUS	963.34	228.94	4.21	0.000	
HHADULTM	754.79	205.54	3.67	0.000	
HHYRSWEK	25.82	11.74	2.20	0.029	
HHMIGYRS	-17.61	17.10	-1.03	0.305	
CONT	-600.2	932.19	-0.64	0.521	

The variables that significantly correlate with household income are average years of education, household migration status, the number of adult men in the household and household cumulative years of work. This result again emphasises the human capital-income nexus and the importance of household migration status to household income, which suggests that change in migration

status of current migrant households, other things equal, will negatively affect household income.

The estimated inverse relationship between household income and age of household head, and also years of migrant work, may be explained by the lifecycle theory. Since most Basotho migrant mine workers generally do unskilled work, variations in earning due to years of work is minimal. So as heads of household grow old and retire from work at about the time when their adult children leave home to establish their own households, household individual and per capita income drop. The negative sign for household farm size is also not unexpected because the contribution of household subsistence agriculture to household income, like the contribution of the women who often work on those farms, is usually not acknowledged. As explained above, farm work is not considered work. Only vocational training had the unexpected sign – probably because many migrant mine workers who receive relatively high wages do not have vocational training experience. It is again noted that years of migrant work does not significantly correlate with household income. When the proportion of adult males is substituted for the number of household adult males in equation 2, it is found that the former did not significantly correlate with income ($P > |t| = 0.583$), though it had a positive coefficient (+106.72).

Several re-runs of reduced versions of the model indicated, as shown in Table 6a, that only level of education, migration status and number of adult males significantly influence household income levels. With the elimination of the non-significant variables, the level of significance of average educational attainment improves to 0.005. This result is similar to the conclusion reached when the incomes of individuals were analyzed.

Table 6a: Determinants of household income - all households

HHINC	Coefficient	Std. error	t-ratio	P > t	F(3, 146) = 18.39
EDUAVEAD	127.29	45.02	2.83	0.005	Prob > F = 0.000
MIGSTATUS	881.51	175.28	5.03	0.000	R-squared = 0.2743
HHADULTM	922.25	190.86	4.83	0.000	Adj R-squared = 0.2594
CONST	-625.3	544.55	-1.20	0.233	Number of obs = 150

In the investigation of the variables that correlate with household per capita income, HHIC in equation 2 was replaced with the per capita income variable, PCHHINC.

$$\begin{aligned}
 PCHHINC = & \beta_0 + \beta_1 EDUAVEAD + \beta_2 HHAGE + \beta_3 HHHAGE + \beta_4 HHADULTM \\
 & + \beta_5 VOCTRNG + \beta_6 HHCATTLE + \beta_7 HHFAMSIZ + \beta_8 MIGSTATUS + \\
 & \beta_9 HHYRSWEK + \beta_{10} HHMIGYRS + \varepsilon
 \end{aligned}
 \tag{3}$$

The estimated equation, shown in Table 7, finds that the variable that significantly correlated with household income do not necessarily also correlate with per capita income.

Table 7: Determinants of household per capita income - all households

PCHHINC	Coeff.	Std. error	t-ratio	P > t	
EDUAVEAD	47.22	14.554	3.24	0.001	F(10, 133) = 4.88
HHAGE	21.48	5.060	4.24	0.000	Prob > F = 0.000
HHHAGE	-14.94	5.415	-2.76	0.007	R-square = 0.2683
VOCTRNG	-53.58	91.571	-0.59	0.599	Adj R-square = 0,2133
HHCATTLE	-3.81	10.544	-0.36	0.718	Number of obs = 144
HHFAMSIZ	2.63	22.502	0.12	0.907	
MIGTYRS	-6.70	5.270	-1.27	0.207	
HHYRSWEK	3.56	3.617	0.98	0.327	
HHADULTM	-8.97	63.352	-0.14	0.888	
MIGSTATUS	269.30	70.565	3.82	0.000	
CONST	98.37	287.320	0.34	0.733	

Lifecycle variables significantly correlate with household per capita income though they did not with household income (probably because of the household size factor), but while per capita income positively correlates with the average age of households, its relationship with the age of household head is negative. As explained above, this may be because household incomes drop during the twilight years when unskilled household heads get closer to retirement. It is also noted that neither years of migrant work nor household cumulative years of work significantly correlate with household per capita income. Again, this may be explained by the limited opportunities for upward mobility in the unskilled work category.

A rerun of the model with only the variables that are significant in Table 7 yielded the following results in Table 8.

Table 8: Determinants of household per capita income

PCHHINC	Coeff.	Std. error	t-ratio	P > t
EDUAVEAD	47.14	13.612	3.46	0.001
HHAGE	20.38	4.743	4.30	0.000
HHHAGE	-14.68	4.292	-3.42	0.001
MIGSTATUS	221.28	54.362	4.07	0.000
CONST	148.092	248.076	0.60	0.551

F(4, 145) = 12.67
 Prob > F = 0.0000
 R-square = 0.2590
 Adj R-square = 0.2386
 Number of obs = 150

Household education level of adults, average age, age of household head, and migration status all correlate with household per capita income at the 1% level of significance or better.

An attempt was also made to identify the variables that correlate with income and per capita income in current migrant households because of the more direct impact migration shocks are likely to have on them. The models in equations 9.2, 9.3, and 9.4 were re-run for only current migrant households. For household income, the estimation of the complete model identified the life cycle variables of average age of household, age of household head, as significant at the 5% level, and the number of adult males and household cumulative years of work are significant at the 10% level, but the proportion of adult males in the household is not significant. And with a $P > |t| = 0.124$, the average level of educating for adults variable is within the 80% minimum requirement for acceptable power of the test. In the initial rerun of the complete model for household per capita income, average age of household and age of household head are significant at the 1% level and average years of schooling of adults at the 5% level. Though number of adult males in the household is not at all significantly correlated with per capita income, the proportion of males has a power level of 88.3%, which makes it reasonably significant.

When the variables that are not significantly correlated with household income are eliminated from the model, household cumulative years of work becomes significant at 1%, the life cycle variables at 5%, and educational attainment of adults ceases to be significant. The results for

household per capita income with the reduced version of the model are quite different: the life cycle variables are significant at 1% and educational attainment of adults at 5%.

Due to the importance of remittance income, not only to current migrant households but also to Lesotho's economy, effort was made to identify the variables that correlate with total remittances. The model used for this purpose is given in equation 4.

$$\text{TOTREM} = \beta_0 + \beta_1 \text{CURRINC} + \beta_2 \text{EDUYEARS} + \beta_3 \text{MIGTYRS} + \beta_4 \text{AGE} + \varepsilon \quad (4)$$

The estimated parameters and test statistics are given in Table 9.

Table 9: Determinants of total remittances

TOTMOREM	Coeff.	Std. error	t-ratio	P > t	
CURRINC	0.217	0.180	12.07	0.000	F(4, 107) = 42.49
EDUYEARS	-44.261	16.840	-2.63	0.010	Prob > F = 0.000
MIGTYRS	14.053	5.955	2.36	0.020	R-squared = 0.6137
AGE	-3.121	6.484	-0.48	0.631	Adj R-squared = 0.5992
CONST	682.211	295.647	2.31	0.023	Number of obs = 112

Age of migrant does not significantly correlate with current migrants' remittances; current income and years of schooling are significant at the one percent level, but years of migration at the 5% level. The high proportions of income that most Basotho migrant mine workers remit in spite of their low level of schooling may help explain the negative correlation between remittance sent and level of education. It is also possible that more schooling correlates positively with more sophisticated lifestyle that increases expenditure in South Africa and, therefore, reduces remittances to Lesotho.

The results of a rerun of the model without age are shown in Table 10. The improvement in the level of significance of years of migration could be an indication of multicollinearity between age and years of migrant work.

Table 10: Determinants of total remittances

TOTMOREM	Coeff.	Std. error	t-ratio	P > t	
CURRINC	0.217	0.018	12.12	0.000	F(3, 108) = 56.98
EDUYEARS	-42.120	16.184	-2.60	0.011	Prob > F = 0.0000
MIGTYRS	12.502	4.991	2.50	0.014	R-squared = 0.6128
CONST	564.290	164.959	3.42	0.001	Adj R-squared = 0.6021
					Number of obs = 112

The discussion of household income in rural Lesotho, in the context of migration shocks, could be enhanced by considerations of the saving behaviour of rural households. The links between saving, investment and economic growth are supported by empirical evidence. A World Bank-sponsored study on saving in Africa linked the poor economic performance of Sub-Saharan Africa (SSA) between the 1970s and 1990s to poor saving and investment performances and observed that low personal savings can translate into low domestic saving and lead to low growth trap. (Elbadawi and Mwege, 1998) Though saving is closely related to investment, an automatic cause-effect relationship does not exist between them; conscious effort is required to create the environment in which savings are readily tapped by the private sector and put into capital formation. That is, saving is a necessary but not a sufficient condition for productive, growth-stimulating investment. Especially in rural areas, financial intermediary, backed by vital institutions, must be accessible for savings to be mopped up and make them available to entrepreneurs for capital formation (de Soto's, 2000: 77-5). Savings held in non-financial forms, e.g. cattle, will not be available for investment and growth. What follows in this section examines the saving behaviour of Basotho rural households and how this may be encouraged and harnessed for rural development.

Because of the limited opportunities for generating income in rural Lesotho, it was hypothesised that savings depends on current non-property income and age. In line with the life cycle hypothesis, it is expected that older Basotho will be under considerably less pressure to save than the younger generation. The model specified is given in equation 5.

$$\text{SAVINGS} = \beta_0 + \beta_1 \text{CURRINC} + \beta_2 \text{AGE} + \varepsilon \quad (5)$$

Table 11 gives the results of the estimation.

Table 11: Propensity to save - all adults

SAVINGS	Coeff.	Std. error	t-ratio	P > t
CURRINC	0.287	0.007	39.76	0.000
AGE	-3.710	1.070	-3.48	0.001
CONST	-12.16	41.4	-0.29	0.769

F(2, 427) = 791.07
 Prob > F = 0.000
 R-square 0.7875
 Adj R-square = 0.7865
 Number of obs = 430

For all adults in the sample, current income and age are significant determinants of savings. And while current income correlates positively with savings, age has the expected negative sign. The policy implication of this finding is to ensure that younger persons are gainfully employed for them to generate the saving necessary for productive investment and growth. The average saving rate of almost 29% is high by SSA standards. Elbadawi and Mwege (1998) estimated that the median saving rate in SSA during the period of 1970-95 was 3.5% and the high savers during the same period average 17.9%. There is therefore need for structures/institutions to be put in place to harness and turn this savings into active capital for rural development (de Soto's, 2000: 15-23), especially since the saving rate of members of current migrant households is even higher than this average. The propensity to save for current migrants is shown in Table 12.

Table 12: Propensity to save - members of current migrant households

SAVINGS	Coeff.	Std. error	t-ratio	P > t
CURRINC	0.306	0.009	35.13	0.000
AGE	-5.025	1.637	-3.07	0.002
CONST	-9.99	61.911	-0.16	0.872

F(2, 247) = 617.93
 Prob > F = 0.000
 R-square = 0.8334
 Adj R-square = 0.8321
 Number of obs = 250

These findings on the propensity to save in rural Lesotho may not be conclusive because no evidence was provided to support respondents' estimates of household savings; however, they indicate a positive attitude towards saving and provide a hypothesis for further investigation. Household saving rates even in the more prosperous neighbour, South Africa, are quite low. Compared to faster growing economies, Eyraud (2009) finds that South Africa's sluggish growth since the end of apartheid is due to underinvestment, which "is explained in part by limited saving". Confirming this finding, the South Africa's Deputy Minister of Finance was said to

have provided the following statistics: household saving as a percentage of GDP has declined sharply from 3.2 percent during the 1980s to 0.2 percent between 2000 and 2008; and, as a percentage of disposable income, it has fallen from around 5.4 percent in the 1980s to 0.28 percent between 2000 and 2008 (Nene, 2009). The finding from this study therefore provides a basis for studying, encouraging and harnessing rural household saving in Lesotho for development that could act as a cushion against the adverse effects of migration shocks.

III. IMPACT OF DWINDLING OPPORTUNITIES FOR EXTERNAL MIGRATION ON RURAL HOUSEHOLD INCOME

This section tests the hypothesis that there is no significant difference in the incomes of non-migrant, former migrant and current migrant households⁷, in which case migration shocks will not have a significant adverse impact on incomes in current migrant households. In this regard, the section compares the key parameters in the distributions of income for the three household types. Specifically, the average income level in current-migrant households is compared with those in former-migrant households and non-migrant household to assess the strength of the evidence against the “no significance difference” null hypothesis. The alternative hypotheses are that incomes in current migrant households are significantly higher than those in former migrant and in non-migrant households solely because of the migration factor. This would mean that, logically, migration shocks will reduce incomes in current migrant households to about the level of those in former migrant households. So, significant differences in the average incomes of the three household types could be used to speculate on the impact of migration shocks on incomes in current migrant households.

It should be mentioned that because this section requires a comparison of incomes in three populations, a separate random sample of incomes should ideally have been drawn from each population and the computed sample parameters used to test the hypothesis of “no significant

⁷ This means that there will be two null hypotheses: $H_0^1 : \mu_{CMH} - \mu_{FMH} = 0$ and $H_0^2 : \mu_{CMH} - \mu_{NMH} = 0$; and two alternative hypotheses: $H_1^1 : \mu_{CMH} - \mu_{FMH} > 0$ and $H_1^2 : \mu_{CMH} - \mu_{NMH} > 0$.

difference in income” among the three household types. However, because a sampling frame does not exist for rural Lesotho, this ideal method could not be used. So the single sample of households drawn for this study was partitioned into three subsamples of sizes 87, 32 and 31 – by household type. Freund et al. (1993: 369-370, 388, 457) repeatedly emphasised that though it is difficult to identify the point at which samples move from small to large, “unless the population has a very unusual shape, $n = 30$ is usually regarded as sufficiently large” and therefore “the sampling distribution of [a statistic] can be approximated with a normal distribution”. Thus, as Newton and Rudestam (1999: 121) noted on sample size and statistical tests, all but asymptotic tests could be applied to the whole sample or the sub-samples in this study (with reasonable caution) since they are all greater than 30 households and therefore “sufficiently large” (Freund et al. (1993: 389).

The key parameters of the distribution of income for the three household types are shown in Table 13.

Table 13: Descriptive statistics of household income – by migration status

Household type	No.	Income ^a	Percentiles			Std dev
			25%	50%	75%	
Non-migrant household	31	1988	800	1440	2300	2044
Former migrant household	32	1643	800	1100	1900	1373
Current migrant household	87	3683	2500	3500	4600	1798

Source: December 2006-January 2007 Household Survey (Mensah , 2010)

Note: ‘a’ Mean monthly income of household type

A cursory look at the percentiles shows that the values for current migrant households are considerably higher than those of the other two household types – as hypothesised. From a welfare angle, this suggests that moving a household from the current migrant category into any of the other two household categories will involve a considerable loss of income and therefore welfare. However, to strengthen this point, a statistical test of differences in means is carried out, using both the z- and t-statistics.

The calculated z-value for the difference in mean incomes between current migrant households and former migrant households is 6.58 and the critical z-values are 2.33 at 1% level of significance and 1.645 at 5% level of significance. Since the calculated z-value is greater than both critical values, the difference in income between current migrant and former migrant households – the actual measure of income vulnerability to migration shocks – is extremely significant. So migration shocks will cause a very significant change in the incomes of current migrant households if their incomes should be reduced to the levels of former migrant households. Similarly, the calculated z-value for the difference in mean incomes between current migrant households and non-migrant households is 4.09, which is greater than the two critical z-values. So, again, migration shocks will cause a very significant change in the incomes of current migrant households if their incomes should be reduced to the levels of non-migrant households

The calculated t-values for the difference in mean incomes between current migrant and former migrant households, and between current migrant and non-migrant households are respectively, 5.82 and 4.34. The degrees of freedom for the two tests are 117 and 116 respectively. The critical t-values at 1% and 5% levels of significance with 117 degrees of freedom are 2.326 and 1.645 respectively – both are the same as the z-values. So the conclusion from the t-test corroborates that from the z-test: Incomes in current migrant households are significantly higher than those in former migrant and non-migrant households. Therefore income vulnerability does result from migration shocks, as shown by income levels in former migrant households.

This conclusion is even more serious in the light of Mensah's (forthcoming) argument that the declining numbers of Basotho migrant mine workers are not market induced and may signal the end of Basotho participation in the South African migrant labour system. Therefore, employment opportunities must be created in Lesotho to absorb the tens of thousands of migrant mine workers who have been retrenched from the South African mine. In this regard, his recommendation for policy makers in Lesotho to seriously consider attracting funding for the development of Lesotho's comparative advantage areas of tourism and handicraft, irrigation agriculture of winter crops, and fish farming in the Katse and Mohale dams deserves attention.

IV. CONCLUSION

This paper has shown that current migrant households in the study rely heavily on remittance income and therefore perform worse than the other two household types in crop production and in entrepreneurship in non-farm business. Former migrant households that have ventured into the small business sector admit taking the leap only after losing their income from migration which is very risky because of the generally high failure rate of new small business. Current migrant households should therefore be motivated to explore the small business terrain while they have the cushion of remittance income. This could reduce their household vulnerability to migration shocks as migrants would return home to an already existing household business, should they lose their mine work. The attitude that “it will not happen to me and so my household does not need to consider starting a small business” could increase vulnerability to migration shocks.

The regression analyses show that the variables that have a significant positive correlation with household income are education level of adults, number of adult males and household migration status. The importance of household migration status to household income again emphasises the negative impact that migration shocks could have on household income in current migrant households. The need for improved education and training for rural Basotho, but especially for members of current migrant households, therefore becomes obvious as an income supporting strategy and a buffer against migration shocks. Women also need to acquire skills for productive self-employment – either in agriculture or in commerce – for their contribution to household income to be acknowledged.

The estimates of saving rates for rural Lesotho, compared to the SSA average and to what prevail in neighbouring South Africa, are quite high. Though these may be taken as crude estimates in view of the data collection method, they suggest a saving potential that should be studied, encouraged and harnessed for rural development – with a view to cushioning the effects of migration shocks.

Finally, both comparisons of the three key percentiles in the distribution of income for non-migrant, former migrant and current migrant households and rigorous statistical testing of differences in household income between the three household types have shown that incomes in current migrant households are significantly higher than those in the two other household types. And so the evidence from the sample studied shows that income vulnerability results from migration shocks, and policies should be put in place to reduce its negative impact on welfare of rural households in Lesotho.

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