The effect of rural inequality on fertility and migration: a literature review

Johann Kirsten & Marie Kirsten[1]

1. INTRODUCTION

It is often argued that the fertility and migration behaviour of rural households in semi-arid areas responds to different distributions of rural resources, especially farm size, but also capital access. Ultimately the resulting demographics can affect the sustainability of land and water use.

The main conceptual issues dealt with in this paper are unequal access to rural assets, and the demographic effects of such rural inequality, specifically on migration and fertility. The interrelationship among these three main variables, as well as their influence on a number of related variables (environment, human capital and poverty) is the main focus of this paper.

Although sufficient literature on the topics of rural inequality, migration and fertility was found, very little research on the interrelationship between such inequality and the demographic and environmental consequences exists. The few studies carried out focused only on the landholding/fertility relationship and mainly in the Indian sub-continent. A paper by Jose (1998) provides a comprehensive review of some of these studies.

In South Africa, Fairlamb (1990) studied the influence of economic factors on human fertility behaviour among households in Kwazulu-Natal and found education and income variables to be the main explanatory variables for family size. No mention was made, however, to inequality. The Development Bank of Southern Africa is funding an ongoing research programme into the relation between migration patterns, infrastructure delivery and livelihoods in, among other things, the eastern seaboard provinces. Although land-related decisions were identified as some of the factors influencing the migration flows, the inequality in rural areas has not been isolated to establish the possible link with migration patterns.
This article reviews initially studies on the distribution of rural resources (farmland and other associated assets) among communities in rural South Africa to obtain an understanding of the extent of rural inequality in rural areas. The main section of the article considers the different effects of the unequal distribution of rural resources. In particular we are concerned with the effect on fertility and migration behaviour of households. First the article addresses the concept of inequality.

2. CONCEPTUAL ISSUES

Rural inequality or an unequal distribution in rural assets seems to be a term defined according to the particular aim of a research project. The definition is often derived from

[1] Respectively, Department of Agricultural Economics, Extension and Rural Development, University of Pretoria and Development Bank of Southern Africa.

the measurement technique utilised,[2] and the measurement of inequality obviously differs between studies with different agendas. This article (and the current research programme in India, Botswana, and South Africa funded by the EU) is more concerned with inequality measures per adult equivalent and not per household. The reason is that high inequality, especially if inherited, may be expected to alter demographic incentives and behaviour. Inequality can refer to the distribution within a society of any of several forms of scarce resources; that is, income, housing, education, nutrition, utilities and other infrastructure, jobs and productive resources (land, assets). Unequal access to any of these resources is, in turn, the outcome of a complicated interplay of, among other things, a country's history, economics, population and policy. Simultaneously, such unequal access to scarce resources is closely associated with certain demographic behaviour. This complex interrelationship among different variables is acknowledged, and this article reflects on these where necessary.

Ricardo and Marx were concerned primarily with the distribution among factors of production (land, labour and capital) and not so concerned about how this distribution between people was reflected. However, Marxism is about the distribution of the means of production, implying that the concentration of the ownership of the factors of production, for instance land and assets, in certain hands will profoundly affect the communities' web of social and political relationships. Differential access to land and rural assets, which are shown throughout the literature to be the most important resources of an agrarian society, will impact on social and other micro-economic variables.

The term inequality is commented on by Kuznets (1955), in his pioneering study on incomes in the United States: 'When we say income inequality, we mean simply differences in income, without regard to their desirability'. The World Bank's Development Report also lists only the differences in the shares of income received by different groups in the population, without making any value assessments. Others indicate that disparities are a better word to use when there is no value judgement. Inequality, according to them, implies some kind of just or unjust system. The Oxford English Dictionary defines inequality as meaning 'the fact of occupying a more or less advantageous position'.

On the macro side, growth has been shown to have limited impact on inequality. According to Kuznets, income inequality tends to first increase and then decrease during the process of economic development. During the early industrialisation period in different countries, labour repression was widespread and it was believed that growth would only happen if industrialists paid labour only a subsistence (living) wage. Although this process certainly brought about industrialisation and growth, it strengthened capitalism and inequality simultaneously. Wood & De Carvalho (1988) state that capitalist development is uneven, and the process of capitalisation is marked by inequalities over time (periods of expansion and stagnation), over space (inequalities between and within countries) and among individuals. Recent literature (Anand & Kanbur, 1993; Bruno et al, 1996; Ravallion & Chen, 1996) argue that there is no 'Kuznets Curve'. It is been argued that a country's level (or growth rate) of real GDP per head appears as such to have no influence on the resulting level (or rate of change) of that country's distributional indicators.

[2] Inequality measurement techniques are not discussed in this paper.

Most studies on inequality (including the recent article by Deininger & Squire, 1996) focus on income inequality and also not only in rural areas. In this paper we are in partular concerned with *asset* (or endowment) inequality in *rural* areas. Few studies considered inequality issues in rural areas separately. This review of studies traces the determinants of rural asset inequality and discusses the two demographic variables closely associated with an unequal distribution of rural assets, that is migration and fertility.

3. INEQUALITIES OF INCOME, LAND OWNERSHIP AND ASSOCIATE ASSETS AMONG RURAL HOUSEHOLDS IN SOUTH AFRICA

This section provides information of the asset ownership among rural households in South Africa. Information is extracted from papers on asset structure, land ownership and wealth. Only a few cases are reviewed to provide readers with a sense of the amount of assets owned per household as well as the distribution of these assets. Ideally one also wants to know the sorts of conditions and policies under which this inequality of asset ownership is commonly found. Unfortunately the literature is very weak in this regard. The effects of inequality on demographic behaviour, that is on fertility and migration, are discussed in the following sections.

South Africa's Gini coefficient (currently 0,58) was, for a long time, the highest in the world, and today only that of Brazil is higher. Another way of expressing income inequality is to examine the shares in total income of groups of households arranged in order of income level. The poorest 40 per cent of households in South Africa (equivalent to 50 per cent of the population) receive only 11 per cent of total income, while the richest 10 per cent of households (7 per cent of the population), receive over 40 per cent of total income. Inequality of income distribution between race groups is considerable, and accounts for 37 per cent of total income inequality. However, income inequality within race groups is also substantial: African households have a Gini coefficient of 0,54, nearly as high as the national figure. Rural/urban inequality is also shown to be significant *(Poverty and Inequality in South Africa,* 1998).

Within the agricultural sector, it is well known that 86 per cent of agricultural land is owned by around 55 000 white farmers, while the majority of the country's black

Table 1: The distribution of land, livestock, labour and household income, Kwazulu

% of Population in terms of access to each factor	Landholding % of total	Livestock % of total	Labour power (labour power units) % of total	Cash income % of total
Bottom 20%	0	0	9,8	4,2
Bottom 40%	10,0	0,14	22,9	13,0
Top 20%	58,3	71,4	20,3	51,1
Top 5%	35,1	32,1	11,4	21,0
Mean of household with factor	1,4 ha	5,0 LSU	5,28 LPU	R2 670
% of households without	23,1	39,1	N/A.	N/A.

Source: May, 1987

population has access to only 14 per cent of total farm land. This is, however, improving slightly as a result of the land reform programme and blacks buying land.

Most studies on rural inequality in South Africa have focused on racial inequalities, while few considered the inequalities *within* rural black households. A study by May (1987) shows that there is considerable inequality among rural households, albeit at very low-income levels. It is also evident from his study that inequality is, to a large extent, linked to the participation of rural households in the wage economy of South Africa. This study was carried out some 13 years ago, implying that the labour market's absorption capacity has changed significantly and will not have such a prominent unequalising factor nowadays. It is generally recognised that wealth is more unevenly distributed than income among poor rural households in South Africa (May, 1987). From Table 1 it is evident that the distribution of land and livestock is particularly unequal, while the distribution of labour power is more even.

A recent study by Carter & May (1997) on a large sample of rural households across South Africa from the PSLSD survey provides further insights on rural inequality. It reveals that just over a quarter of African rural households has access to a plot of land for the cultivation of crops. Average land size for these households is 2,2 ha. A similar pattern is repeated with respect to the ownership of livestock, with some 24 per cent of African households in rural South Africa owning livestock with an average holding of 5,4 mature livestock units (MLU) valued at approximately R4 300. The incidence of ownership is lower than that reported by studies undertaken in the early to mid-1980s, suggesting that there has been a decline in access to this particular endowment. This trend may be a result both of drought conditions and of the population expansion in dense rural settlements which do not have access to grazing land (Carter & May, 1997).

Ownership of agricultural and other productive equipment is limited to 18 and 8 per cent of rural African households, respectively. As this refers to important agricultural tools

such as ploughs and harvesters, as well as to tools which could be used in small and micro-enterprise manufacturing activities, such as welding and sewing, this is likely to place severe constraints on the development of rural non-farm income generation opportunities. With regard to fungible assets, meaning assets which household could convert to cash in any way, Carter & May (1997) found that 20 per cent of rural African households have no such assets. Households in this group have no safety net, are extremely vulnerable to any loss of income, are unable to liquidate an asset to cover unexpected expenses or invest in new opportunities, and lack any possible resource which could be used as security against credit.

Access to human capital (educated labour) emerges as the most common endowment of rural households. Thirty-seven per cent of households have an adult household member with 10 years or more education, and 78 per cent an adult household member who could be considered functionally literate. Finally, in 30 per cent of households there is a person of pensionable age, and in 35 per cent a member of the household is a migrant in another area.

In terms of capital, households which are dependent upon wages in the secondary labour market emerge as the least well off, with the mean value of assets worth less than R2 386. Households dependent upon pensions also have very little capital, although they have some access to land and to educated labour. To some extent it can be suggested that these households are in a late stage of their life cycle, and are liquidating their assets. At the other extreme households receiving entrepreneurial income are the wealthiest in terms of ownership of capital, with the mean value of assets worth just under R39 000. Households dependent upon wage labour tend not to have landholdings, and are most common among vulnerable households, that is those reliant upon remittances and pensions.

A case study of a rural community in the Eastern Cape by De Wet (1995) further highlights the importance of land ownership and land tenure in economic differentiation. The community has different types of land tenure. There are approximately 500 landowners (freehold and quitrent): 59 households occupy trust land; 236 households are in so-called new residential areas and 40 squatters and households live on the commonage.
The landowners continue to be substantially better off. They are able to use their superior education and income levels to secure the better-paying jobs and to improve themselves. In terms of almost every measure of material welfare such as cash income, education levels, access to skilled jobs, women obtaining employment, land holdings, livestock holdings and living space, the landowners are clearly better off than the rest of this community. Table 2 illustrates this.

4. SOURCES AND DETERMINANTS OF INEQUALITY

The structure of landholdings has long been recognised as an important determinant of equity and efficiency in the agricultural sector. Land reform can therefore rightfully be considered as the most powerful factor influencing income distribution and rural inequality. Fishlow (1995) argues that the high inequality in Latin America relates back to the high rates of inequality in land distribution in the past. Human capital is generally regarded as the second most important factor influencing inequality in rural areas. Different sources of income also have an important influence on inequality.

The issue is, however, how can we control for all the other variables? Fishlow (1995) states that inequality is not merely a random variable, it varies systematically with respect to a series of related development factors (secondary school attendance, past population growth, the share of income generated by agriculture, physical asset structure, and accumulation of human capital, etc). In this section the role of land, capital, non-farm income (mainly migrant remittances) and technology in determining rural inequality is discussed.

Table 2: Economic indicators differentiating between landowners and other households in Rabula, Eastern Cape

	Land-owning households	Other households
Annual cash income(1987)	R4 770 (100% of households)	R2 444 (51% of households)
Years of education per adult	8,51	7,16
Percentage of households owning livestock:		
Cattle	82%	16%
Sheep	32%	0%
Goats	86%	83%
Average household livestock holdings		
Cattle	7,85	0,16
Sheep	10,39	0
Goats	11,04	5,00

Source: De Wet, (1995).

4.1 Land and capital

It is hypothesised that overall inequality substantially affects demographics via fertility and/or migration. Land is often considered the main determinant of rural wealth and thus rural inequality. However, it is important to acknowledge that land can play a more or less important role in affecting overall (income, wealth and consumption) inequality. One of the studies that confirms this notion is the study by Julka & Soni (1988). Their study (including only 252 cultivating households) supports the view that widespread inequalities of incomes in rural areas have their origin in an unequal distribution of land and other productive assets. As indicated in Table 3, land distribution is found to be the single dominant factor contributing to income inequality. They find that over 40 per cent of the income inequality can be attributed to land area, with the number of farm workers and milch cattle accounting for another 25 per cent and 6 per cent respectively. Thus the size-related variables together explain 71 per cent of income inequality.
In a study of an irrigation scheme in Sudan, Hassan et al (1989) show that the distribution of land is not necessarily always the major determinant of rural income

inequality. In the Rada Irrigation Scheme water and land are publicly owned and distributed to tenant farmers on an equal basis. This approach naturally suppresses inequitable access to land and water as a possible source of income inequality. Despite this situation the authors still found substantial wealth and income inequality among the tenant farmers on this particular scheme.

Table 3: Decomposition of the Gini coefficient through determinants of income inequality: Punjab, 1980

Control variable	Per cent contribution
Area operated (acres)	40,68
Number of farm workers	25,42
Number of milch cattle	5.08
Education of the head	1,69
Dependency rate	0,00
Relative position of the household	16,95
Off-farm rural employment	0,00
Off-farm urban employment	1,69
Productivity (farm output per acre)	8,48

Source: Julka and Soni, 1988.

The study by Hassan et al (1989) analyses the distribution of productive assets other than land and water as the key to explaining rising inequality. Capital is an important production resource that is privately owned and allocated by the tenant households. The impact of differential access to capital assets on the distribution of net household income and end-of-year wealth was examined. The results show that wealthier households earned higher incomes, saved, and became wealthier, while most of the poorer households did not save and became relatively poorer.

Owing to a lack of access to institutional credit many households resorted to the liquidation of physical assets, wage labour and other non-farm income to finance remaining marketing and production activities. From this follows that differential access to capital assets results in differential on and off-farm investment opportunities and the unequal status of farmers participating in the capital and labour markets. The assets included in the wealth assessments of households were the value of producing and work animals, the value of farm tools and implements and non-farm income generating assets. The results show that inequality in wealth distribution increased by more than 28 per cent in one year. The outcome was more concentration of wealth and sharper income differences. The study also shows that the rich invest more of their capital in non-farm activities, which generated 87 per cent of their non-farm income.

The plight of the poor was partially relieved by off-farm work and out-migration of family members to earn wages in other occupations. This is confirmed by the statistics reported by Hassan et al (1989) indicating that shares of wage labour and transfers in non-farm income are inversely correlated with wealth. Options for the poorer groups are clearly limited due to their low access to the necessary financial assets.

4.2 Human capital

In her study of poverty and inequality in Tanzania, Ferreira (1996) also singles out human capital as one of three most important assets of rural households - the other being land and livestock. The inequality in human capital ownership between the poor and better-off households in the rural areas of Tanzania is reflected in literacy levels as shown in Table 4. The inequality in human capital ownership is even more striking between genders with women more likely to be illiterate than men.

Table 4: Literacy among people older than 14, Tanzania, 1991

	Income groups (%)			Gender (%)	
	Better off	**Poor**	**Very Poor**	**Male**	**Female**
Read and write	67,6	54,5	52,8	70,7	51,2
Read only	4,3	8,3	9,2	7,3	5,4
Neither	28,1	3,2	38,0	22,1	43,4

Source: Ferreira, 1996.

In Tanzania, unlike in countries such as India and Pakistan, quantity of land is not a major determinant of poverty status and income distribution. Very few rural households are excluded from land. However, landholdings were unequally distributed. Nearly 50 per cent of the households had less than 3 hectares in 1991. Nevertheless, the inequality in income distribution is much greater than the inequality in landholdings.

4.3 Migration and non-farm income

The literature discussing the relationship between migration and rural inequality essentially addresses the issue from two angles:

- the effects of migration (and the different types of remittances) on rural inequality,and
- the effect of rural inequality on migration (addressed in section 6).

The work of Adams in rural Pakistan (Adams, 1992, 1996; Adams & He, 1995) investigates the effects of different types of remittances on inequality. Adams measures the effect of external as well as internal remittances on income distribution, asset accumulation and rural inequality in rural Pakistan. By measuring the effect of different types of remittances on the rural population, Adams also indicates how remittances are used (consumed/invested, etc).

Adams used data gathered over three years (1986-87 and 1987-88) from 727 households to establish the effects of internal and external remittances on income distribution and asset accumulation in rural Pakistan. The study found that internal remittances were earned mainly by lower income groups and that

such remittances formed an important component of the incomes of households at the bottom income quintile. As a result, internal remittances accounted for only a small proportion of overall income inequality - less than 3 per cent. Upper-income groups, who usually had more access to the expenses associated with international migration, mainly earned external remittances. External remittances therefore increased inequality, and accounted for 12 per cent of overall income inequality. Adams controlled for five different types of rural assets: irrigated land owned, rain-fed land owned, livestock assets, agricultural capital and non-farm assets, and found that external remittances have the most significant effect on irrigated and rain-fed land owned. In rural Pakistan, households with the financial means to do so tend to invest in irrigated land. Returns on such land is high, but increased land ownership bears an important element of social prestige. This is quite disturbing since increasing external remittances can exacerbate inequality by worsening the main sources of income in rural Pakistan, namely land.

Table 5: Sources of income ranked by size of three year mean average landholding, rural Pakistan

Size of average landholding (acres)	Number of households in group	Average per capita income (Rupees)	Per cent from non-farm income	Per cent from agricultural Income	Per cent from livestock income
0	126	2 650	57,1	1,4	11,3
<1	82	3 167	46,6	0,5	13,2
1-5	180	3 203	39,4	12,5	18,2
5-10	171	3 096	23,0	32,4	18,0
>10	168	4 068	15,8	50,3	10,3

Source: Adams, 1995

Remittances have, however, no statistically significant effect on the accumulation of livestock assets. The study by Adams shows that remittance income can and does play a role in rural asset accumulation. However, the number of educated household males, and total household income (excluding remittances) has a more important statistical effect on rural asset accumulation than remittance income. Adams concludes that external remittances have a negative effect on income distribution and may lead to a process of rural land accumulation by the rich.

Adams (1995) analyses the same Pakistani dataset to establish which of five types of income makes the largest contribution to rural inequality (Table 5). The income sources analysed include non-farm income, agricultural income, income from livestock, rental income and transfers. The study shows that agricultural income makes the largest contribution to overall income inequality. The main reason for this is that agricultural income is positively and

significantly correlated with land. The study further differentiates the sources of agricultural income into cash and food crops to establish which has had the bigger impact on inequality. Findings suggest that rural equity will be advanced if more emphasis is placed on wheat, rice, fodder and barley. Sugarcane was found to be artificially priced and to increase inequality.

Stark et al (1986) confirm the findings of Adams on the impact of migration with their study of two rural villages in Mexico. They found that Mexico to United States migrants have a profound unequalising effect on village income, while internal remittances have a favourable effect on income distribution. Contrary to Adams's Pakistan study, Stark et al found a significant relationship between schooling and opportunities for internal migration, whereas Adams established that it is the less educated who tend to earn internal remittances. Adams (1993) did, however, find that in rural Egypt the least educated had the highest propensity to pursue external migration. Stark et al show that in two Mexican villages international immigration increases, but internal immigration decreases intra-village inequality. Lipton *(*1977) showed that intra village inequality increased village emigration.

The same article by Stark et al (1986) argues that it is very important to know what the impact of rural out-migration is upon the distribution of household income, since changes in rural income inequalities can have important implications for social welfare and development. The paper challenges Lipton's (1977, 1980) view that rural out-migration leads to a worsening of village income distribution. Lipton indicates that migrant absence from rural areas generates negative externalities of different types -the remittances are either small or go to the disproportionately better-off. Lipton found that in highly unequal villages the rich and the poor have the greatest propensity to migrate, but that they migrate in different ways. The poor migrate from rural to rural areas, and are less successful in achieving income gains than the richer villagers who are attracted to the urban areas. Ongoing research by Cross et al (1998) on the eastern seaboard of South Africa also found overwhelming evidence of rural to rural migration.

De Janvry & Sadoulet (1996) conducted a study in Latin America to identify the relationship between growth, poverty and inequality. They found that the poverty-reducing effects of growth are seriously weakened by the inequalising effect of growth. They found that rural-urban migration reduced poverty, but increased inequality. The authors found that the selective bias of migration in favour of the non-poor weakens its force as an instrument to reduce rural poverty.

Lanjouw & Stern (1989) also found in their study of a village in Uttar Pradesh that non-farm income has a substantial impact on inequality. Where some lower castes had seized the opportunities for non-farm jobs initially, the higher castes were more prominently represented. As a result non-farm income became a major source of inequality.

4.4 Access to technology

A study by Meinzen-Dick (1989) analyses the agrarian structure in 11 villages of North Arcot District, Tamil Nadu during 1982-84. These villages are all characterised by the highly stratified agrarian structure in terms of caste and control over resources. She found that in villages with poorer irrigation, access to surface irrigation on smallholdings compensates somewhat for inequality in control over land. In villages with good irrigation control over land and water are mutually reinforcing, so that inequality in land in household resources is greater than indicated by the Gini coefficient for the distribution of land ownership. It was further also evident that farmers with greater resources have an advantage in investing in the new technology, despite widespread ownership of wells and pumps in the area.

Control over land and water resources made households less dependent on wages for subsistence, but those with unirrigated holdings were little better than landless labourers. It was shown that irrigation development affects agrarian structure by increasing agricultural production for cultivators and generating employment for agricultural labourers.

5. EFFECTS OF RURAL INEQUALITY

5.1 The effect of rural inequality on fertility[3]

Land is usually the principal store of wealth in the rural economy. Land is also central to rural economic and social structure, which suggests that the distribution of this resource is important to an understanding of behaviour in rural areas (Schutjer et al, 1983). The distribution of land is a primary determinant of income distribution in rural areas and thus also a primary determinant of total inequality in rural areas in many developing countries. While this relationship has long been recognised, very little research has been carried out on the relationship between aspects of agricultural land and variation in human fertility. Very few studies have specifically considered the relationship between inequality and fertility behaviour. Kleinman (1973) found an index of land concentration to be negatively related to fertility in India. Rosenzweig & Evenson (1977) used measures of land size as well as inequality of holdings in an ecological model relating fertility, schooling and the economic contributions of children in rural India. They report a positive relationship suggesting that a reduction in inequality would increase family size in India. Clearly, in most of these relationships time lags matters. In the short term, lower inequality cuts child mortality among the poor as they become less poor. Only later do they respond by cutting fertility, but then the effect is normally more than the mortality effect. Family size first rises and then falls.

A multicountry research project funded by the EU and conducted in South Africa, Botswana and India endeavours to establish empirical evidence on the

[3] For a more current perspective on the links between inequality and fertility, readers are referred to a recent book by Livi-Bacci & De Santis (1998).

relationship between rural inequality and family fertility. This hypothesised relationship between rural inequality and fertility assumes the existence of a causal relationship between land and fertility. Since many of the earlier studies considered only the relationship between land ownership (and land size) and

fertility, and since land is central to rural wealth, it is therefore appropriate to provide a brief overview of these studies and their major findings.

5.1.1 Relationship between landholding and fertility

There are at least two dimensions of land that appear to be important for fertility behaviour. These are, first, the size of landholdings (access to land use) and secondly, the legal and institutional arrangements of land ownership (Schutjer & Stokes, 1982; Schutjer et al, 1983; Maglad, 1994). These dimensions are distinct in that an individual or a household may have use rights, but no ownership rights, and as a result different tenure systems will lead to different income streams.

Land ownership can generate an income stream beyond the period during which the operator is receiving a return on his/her labour. Thus, conceptually it is likely that policies directed at broadening land ownership will reduce desired family size as they reduce the weight assigned to future parental security obtained from children (Schutjer & Stokes, 1982). In a predominantly agricultural setting, it is therefore argued that land ownership plays an important role in fertility decisions (Desai & Alva, 1998). A limited number of studies have considered the relationship between family size of landowners, tenants and landless labourers, and most provide support for the hypothesis that a more equitable distribution of ownership leads to smaller families.

Three studies in the Philippines (Hawley, 1955; Hiday, 1978; Schutjer et al, 1980) serve as examples. In investigating the influence of land tenure on fertility, these studies have found that:

- farm tenants had higher fertility in all age groups of women except one;
- the direct effect of land ownership on fertility was positive; and
- owners and part-owners had the lowest fertility.

Further, Schutjer & Stokes (1982) refer to a study in Thailand and one in Egypt, both of which capture the relationship between land ownership and fertility more sensibly.
Both analyses employ multiple regression techniques in an analysis of family size variation among farm families with varying degrees of land ownership. In both cases land ownership is negatively and significantly related to fertility. Land ownership was found to be the most important variable in explaining the variation in total fertility in Egypt and Thailand.

It has proved difficult to establish empirically the impacts of land ownership on fertility from the impact associated with farm size and *access to land,* and the institutions associated with ownership. In some cases, especially among Indian

farmers in the Punjab, high fertility has represented a means of acquiring land, holding on to land and obtaining maximum benefits from the land through the elimination of hired labour (Schutjer & Stokes, 1982).

At the individual farm level, De Janvry (1976) suggests that increasing farm size should be negatively related to fertility owing to the downward shift in the marginal productivity of child labour associated with the increased complexity of tasks, the use of non-family labour and labour-saving machinery. Increase in farm size leads to the introduction of labour-saving technology, which then leads to the reduction in the demand for child labour. However, in regions where farms are not mechanised there is a strong positive relationship between farm size and the demand for family labour.

Another study by Devany & Sanchez (1977) on Mexican *ejidos* found that a negative relationship between land ownership and family size could be offset by pro-natalist conditions governing access to land. It is argued that the *ejido* system of granting rights to land on a usufruct basis creates a series of incentives that raise fertility. These include the benefits of children in terms of direct labour services in production. The uncertain land rights limit the degree to which the family can depend on investment in the farm. From their findings, Devany & Sanchez (1977) conclude that reducing the uncertainty with regard to land rights, restoring the land market, and initiating steps to improve markets would reduce the incentives to higher fertility.From their review of some of the empirical studies listed in Table 6, Schutjer & Stokes (1982) conclude that access to land at national, regional or individual family level is likely to result in greater economic returns for child labour, and hence contribute to the maintenance of a higher level of desired family size than would prevail should land be less available. The generally negative and perhaps greater impact of land ownership on fertility militates against simple interpretations regarding the potential fertility impacts of a land redistribution policy. If the negative impact of increasing land ownership is stronger than the positive effects of increasing size of holdings, then careful attention should be given to the conditions under which land is redistributed.

The first relationship represents price and income effects because families with large areas of land could use additional areas of land more profitably and thus expect a lower cost of children. The underlying assumption is that the income effect of a lower cost of children on the demand for children is positive and it reinforces the unambiguous price effect that induces an increase in the demand (Maglad, 1994). In terms of the second relationship, most of the studies reviewed above argue that land ownership substitutes for children as a source of parental security in old age and contributes to lower fertility.

This effect is largely reflected by the effect of schooling, higher cost of children and female education on fertility. Rosenzweig & Evenson (1977) found that *land inequality*

Table 6: A summary of studies consulted on the relationship between landholding and fertility

Author(s)	Year	Country	Sample population	Relationship of size of holdings to fertility
Rosenzweig & Evenson	1977	India	189 districts	Land size has a positive and significant effect on fertility
Driver	1963	India	Family data in central India	More children for largest land owners and fewer for landless and smallholders
Kleinman	1973	India	315 districts	Cultivated acreage per household positively and significantly related to fertility
Latif & Chowdry	1977	Bangladesh	Village in northern Bangladesh	Positive relationship between size of holdings and fertility
Latif & Chowdry	1977	Bangladesh	Village in southern Bangladesh	No relationship
Stoeckel & Chowdry	1969	Bangladesh	Region	Landholdings are negatively related to actual fertility
Stoeckel & Chowdry	1973	Bangladesh	Region	Lower desired family size among households with small landholdings
Aghajanian	1978	Iran	505 rural households in southern Iran	Size of holdings was strongly and positively related to fertility
Stewart	1980	Egypt	Farm families	Land ownership negatively related to fertility
Chalamwong et al	1979	Thailand	21 villages, 840 farm families	Land ownership negatively related to fertility
Schutjer et al	1983	Egypt	12 villages, 561 households	Amount of land available positively related to fertility
Mahmud & Mcintosh	1980	Bangladesh	2 districts from BIDS rural poverty study	Positive relationship between land size and fertility
Niraula	1989	Nepal	One village, 241 households	Positive relationship between area of land and fertility
Magl ad	1994	Sudan	26 villages, 599 farm households	Land area cultivated positively associated with fertility
Desai & Alva	1992/93	India	51 000 rural households in 25 states	Landed households have smaller families – curvilinear relationship between farm size and fertility

Note: Most of the studies considered owned and operated land in their analysis but none considered per capita land ownership. The study by Kleinman is the only exception. This study is also the only study of those listed here which took land quality into account.

is positively and significantly related to school enrolment rates of children. This links up with the finding of Schutjer et al (1980), that the total effect of land ownership is to reduce fertility through its influence on female education.

However, the available research on size of holdings and fertility is characterised by a number of empirical and conceptual problems. Empirically most studies were not primarily directed at estimating or understanding this relationship. Conceptually, questions may be raised as to the causal direction of the effect.

Cain (1985) started a big debate on the latter issue in the literature. He questions the 'land security' hypothesis on which many of the arguments of Schutjer & Stokes are based. Cain argues that the direction of causation is from fertility to ownership of land rather than the other way round as claimed by Schutjer & Stokes. It can be argued that households that have been more fertile are under pressure to acquire more owned and especially operated land.

Another aspect most of the studies have ignored is the quality of land. None of the studies make any reference to land quality. The productivity of the land is equally important to determine socio-economic status in rural settings. Better quality land yields more production and is hypothesised to be labour intensive. This too supports high fertility (Niraula, 1989). However, Kleinman (1973) argues that where land is inferior, greater labour inputs are also required to attain a given product from a given amount of land. If households require more labour than the males can or will provide, females are likely to be the additional source of labour. Although a greater workload for females results in lower fertility in western societies, this is not necessarily the case for pre-industrial societies.

A final aspect that could complicate the relationship further is the effect of systems of land tenure and inheritance. Most of the studies referred to in this paper were done in the context of private ownership of land. It is therefore not clear what the outcome of similar studies in areas of southern Africa with traditional tenure systems would be. One can argue that household demographic behaviour might be considerably different.
Most of the studies quoted in this section were also performed in the 1970s. It is precisely for this reason that the current research project is trying to test whether this positive relationship still holds today.

5.1.2 Demographic effects of rural inequality: some evidence

Few studies have actually linked the inequality of land and asset ownership to different demographic behaviour. One notable exception is an investigation that was conducted by House (1991). He studied a village in southern Sudan where there was extreme income inequality, with the poorest 10 per cent of the inhabitants receiving only one per cent of total income, while the richest 10 per cent captured 42 per cent of total income. The Gini coefficient for this distribution is 0,53, an indication of extreme inequality.

From Table 7 it is also evident that the poorest households own the fewest non-

land assets. The results provide some useful insights into the link between income inequality and fertility behaviour. Although the number of children is more or less similar, the knowledge and use of contraceptives are clearly higher among the richer quartiles.

Table 7: Difference in demographic behaviour between different income groups, Southern Sudan

	Income group			
	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Mean income per adult equivalent	38	81	158	513
Assets: (% owning)				
Radio	4	15	7	62
Clock/watch	16	23	15	58
Bicycle	28	58	41	77
Steel bed	28	65	67	85
Mattress	56	65	85	92
Table	52	77	67	92
Shoes	80	77	74	96
Modern door	56	81	78	96
Index of assets (0–14)	5	7	6	9
Number of animals owned	8	11	16	20
Child school attendance (%)	21	47	42	46
Mean years of schooling (wife)	1,0	0,4	1,1	1,7
Household size	6,3	5,6	5,1	5,1
Number of children	2,5	2,6	2,0	2,6
Wives in good health	28	27	35	50
Wives contraception:				
Ever heard of (%)	48	46	67	69
Ever used (%)	16	15	44	38

Source: House. 1991.

5.2 Effect of rural inequality on migration

Unequal access to rural assets, mainly land and related assets, could be the result of migration behaviour (see section 3). It is more likely, however, that rural inequality will influence the behaviour and trends in migration. This demographic effect of rural inequality is touched upon by Adams (1996) in his discussion of who migrates. He argues that the decision to migrate depends on a host of intervening variables. These variables include the role of information, the influence of risk and the costs (social, psychological and financial) of migration. Stark et al (1986) also argue that the availability of information about migration opportunities is crucial for successful migration. Their study,

conducted in two villages in Mexico, measures the effects of remittances from internal and international migrants on income inequality. These results are discussed above, but Stark et al argue further that the results indicate that the impact of migrant remittances on the rural income distribution depends on:

- a village's migration history and the degree to which migration opportunities are diffused across village households; and
- the returns on human capital and the distribution of remittance-enhancing skills and education.

Table 8: Socio-economic characteristics of non-migrant, internal migrant and international migrant households in Pakistan

Item	Non-migrant households	Internal migrant households	International migrant
Mean irrigated land (acres)	5,25	2,00	2,36
Mean rain-fed land (acres)	1,76	4,30	4,20
Mean household size	8,67	9,99	11,98

Source: Adams, 1992.

De Haan's (1997) study of migration patterns in India reveals that the landless are more likely to migrate, but that the difference between their migration patterns and that of households with minimal land is marginal. De Haan mentions that the migration decision is also dependent on the migrants' personal evaluation of his/her relative wealth.

Mohtadi (1990) used Iranian data (1956-76) to establish the role of rural inequality in determining whether rural push or urban pull factors caused migration. He found that the unequalising effect of Iranian land reform caused rural push factors to dominate pull factors during the particular period. Urban pull factors started to play a more prominent role after rural push migration had sufficiently paved the migratory paths and established rural-urban contacts. An analysis of the Latin American countryside (Shaw, 1974) provides strong empirical support for the institutional argument that farmers' limited access to land is inversely related to the exodus from the countryside. An empirical analysis of three Pakistani villages by Nabi (1984) further supports the importance of factors other than Malthusian population factors (Table 8). Issues such as mechanisation and indebtedness are raised, and a study by Mothadi (1986) in Iran finds that, with the transformation from the traditional sharecropping arrangements into modern capitalist ones, inequality increased. Lipton (1980) found that the 'better off villagers tend to be pulled and the worse off villagers pushed from the same subset of relatively unequal villages'.

5.3 Effects of inequality on the environment

Dasgupta (1995) refers to recent findings by the World Bank on sub-Saharan Africa which have revealed a positive correlation among poverty, fertility and

the deterioration of the local environment. The victims hit hardest are the migrants and the dispossessed. Dasgupta (1995) argues that families with greater access to resources are in a position to limit their size and propel themselves into still higher income levels. With greater inequality said to be one of the causes of poverty, it can be deduced that there could also be a strong interconnectedness between inequality and the local environment. While judgements about causality cannot be made, the data do support the idea of a positive feedback process between the various components.

6. CONCLUDING COMMENTS

A survey to test the relationship between rural inequality, and fertility and migration behaviour is currently (1999/2000) underway in the semi-arid regions of Botswana, South Africa and India. This research will consider both the relative wealth of the sample, as well as the inequality among the households sampled. This 'wealth' will be measured not only in terms of land size and asset holding, but will also provide for human capital and income sources other than those generated from the land (non-farm, remittances, rent, etc). These variables will assist in establishing the factors influencing migration decisions as well as indicate how migrants' remittances influence inequality. To add a different dimension to the investigation, data on gender are also incorporated to test which women migrate, and how women's remittances are utilised differently from that of men.

Gender remains an important factor in determining access to economic resources and control over fertility and will therefore also be tested in the fieldwork. In this paper very little reference was made to gender, but this does not mean that gender does not have a profound impact on demographic decisions. Hopefully the current research will reveal more about the role of gender and intra-household relationships in population dynamics and demographic decisions.

Although our focus has thus far been only on wealth and asset variables, we are of the opinion that unequal access to infrastructure, institutions and markets could be important dimensions which could also indirectly influence the demographic behaviour of rural households. This will also be tested in the research project mentioned.

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