

EPRI RESEARCH PAPER #29

Linkages between Poverty and the Environment: Evidence from Cross-country Studies and the 1999 October Household Survey

produced by the
Economic Policy Research Unit

25 March 2002

Ms. Allison Stevens (EPRI)

Ms. Talitha McCarthy-Johnson (EPRI)

Dr. Michael Samson (EPRI and Williams College Center for Development Economics)

Mr. Kenneth Mac Quene (EPRI)

Ms. Ingrid van Niekerk (EPRI)

**Economic
Policy
Research
Institute**



This research paper is sponsored by USAID and administered by the Joint Center for Political and Economic Studies Inc. under grant no. JCNAT98-954-01-00 from Nathan Associates Inc. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the United States Agency for International Development.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	2
2. LITERATURE REVIEW OF THE POVERTY-ENVIRONMENT RELATIONSHIP	2
3. THE POVERTY-ENVIRONMENT RELATIONSHIP IN THE SOUTH AFRICAN CONTEXT	9
3.1 ACCESS TO SOURCES OF WATER.....	9
3.2 ACCESS TO SOURCES OF HEAT	12
3.3 ACCESS TO SOURCES OF LIGHTING	14
3.4 ACCESS TO SOURCES OF COOKING	16
3.5 ACCESS TO REFUSE REMOVAL SERVICES	18
3.6 ACCESS TO SANITATION FACILITIES	20
4. CONCLUSION.....	23
BIBLIOGRAPHY	25

LIST OF TABLES

TABLE 1: ACCESS TO SOURCES OF WATER	10
TABLE 2: ACCESS TO SOURCES OF HEAT.....	12
TABLE 3: ACCESS TO SOURCES OF LIGHTING	14
TABLE 4: ACCESS TO SOURCES OF COOKING	16
TABLE 5: TRAVELLING DISTANCE TO ACCESS FUEL	17
TABLE 6: ACCESS TO SOURCES OF REFUSE REMOVAL	18
TABLE 7: ACCESS TO TOILET FACILITIES	21
TABLE 8: TRAVELLING DISTANCE TO ACCESS TOILET FACILITIES.....	22

LIST OF FIGURES

FIGURE 1: ACCESS TO PIPED WATER IN DWELLING.....	10
FIGURE 2: DEPENDENCE ON STREAMS, DAMS, POOLS OR STAGNANT WATER	11
FIGURE 3: DISTANCE TO WATER SOURCE	12
FIGURE 4: ACCESS TO ELECTRICITY FOR HEAT	13
FIGURE 5: ACCESS TO PARAFFIN, WOOD AND COAL FOR HEAT	14
FIGURE 6: ACCESS TO ELECTRICITY FOR LIGHTING	15
FIGURE 7: ACCESS TO PARAFFIN AND CANDLES FOR LIGHTING	15
FIGURE 8: ACCESS TO ELECTRICITY FOR COOKING	16
FIGURE 9: ACCESS TO PARAFFIN, WOOD AND COAL FOR COOKING.....	17
FIGURE 10: TRAVELLING DISTANCE TO ACCESS FUEL	18
FIGURE 11: REGULAR REFUSE COLLECTION.....	19
FIGURE 12: NO REFUSE REMOVAL	19
FIGURE 13: REFUSE REMOVAL VIA OWN DUMPS	20
FIGURE 14: ACCESS TO IN DWELLING FLUSH TOILETS.....	21
FIGURE 15: ACCESS TO ON SITE FLUSH TOILET AND UNVENTILATED PIT LATRINE.....	22
FIGURE 16: TRAVELLING DISTANCE TO ACCESS TOILET FACILITIES.....	23

EXECUTIVE SUMMARY

The poverty-environment relationship is mutually reinforcing because the lack of access to environmentally friendly amenities causes impoverished households to contribute to ecological damage; and environmental degradation contributes to the impoverishment of many poverty-stricken households.

This is evident in the October Household Survey analysis of household access to and sources of environmental amenities in South Africa. Many poor households are not electrified, and as such have to use alternative sources of environmentally unfriendly amenities. Dependence on coal, paraffin, wood and candles causes air pollution and other environmental damage (such as deforestation caused by accessing wood for heat and cooking). Inadequate sanitation and refuse removal amenities further harm the environment by contaminating water supplies and polluting land.

The environmental damage resulting from the lack of access to environmentally friendly amenities increases poverty levels. Polluted water, land and air is a serious health problem for poor people. Sickesses and illnesses caused by pollution can only worsen their poverty situation.

The poverty-environment relationship has important policy implications. For social policy, the challenge is to increase environmentally friendly amenities for the poor, particularly potable water supply, flush sanitation and electricity.

1. INTRODUCTION

There are many conflicting opinions about the linkages between poverty and the environment. The opinions are diverse and range from the role poverty plays in harming the environment to the possibility of reducing poverty while utilising and managing natural resources.

This paper analyses the linkages between poverty and the environment through examining how poverty affects environmental degradation, and how environmental degradation worsens the impact of poverty at a household level.

The first main section of the paper (Section 2) provides a literature review of the poverty-environment relationship. Section 3 explores the relevance of the issues raised in the first section to South Africa through an analysis of data from the 1999 October Household Survey. The final section (Section 4) provides a conclusion.

2. LITERATURE REVIEW OF THE POVERTY-ENVIRONMENT RELATIONSHIP

There is a relationship that exists between households and environmental change, which is often referred to as the “poverty-environment relationship.”¹ Many investigations into relationship have focused on the extent to which poverty affects environmental degradation. “It has long been recognised that the poor, not only in rural areas but in urban ones as well, have a close relationship to the environment for their livelihood and survival strategies, and that their lives are greatly affected by the way others around them use environmental resources.”² Some argue that, those who are in desperate poverty are often left no choice other than to exploit whatever natural

¹ Cavendish (1999).

² Ambler (1999).

resources are available to them, even though this may worsen their situation in the long run.³

Others take the view that although when there are both large levels of poverty and environmental degradation, it is tempting to assert that poverty causes environmental degradation, but that is not the case.⁴ “[P]overty and environmental degradation may be positively correlated, but does not imply causation.”⁵ Yet another view is that it may be possible to utilise and manage natural resources in a sustainable manner and at the same time reduce poverty. That is, “the use of resource management in a manner that favours the poor, while maintaining the long-term sustainability of the resource.”⁶

Some contend that, “[e]nvironmental degradation and poverty reinforce each other; the poor are both *agents* and *victims* of environmental destruction.”⁷ Conversely, it has also been argued that those of greater economic status may also produce environmental degradation by placing increasing demands on environmental resources thereby requiring a greater environmental need.⁸

Problems associated with environmental degradation cited in the World Bank’s 1992 World Development Report include⁹:

- deforestation,
- land degradation,
- water shortage and contamination,
- air pollution,
- loss of biodiversity

³ Heady (1998).

⁴ Barbier (1999).

⁵ *Id.*

⁶ Heady (1998).

⁷ Angelsen (1997).

⁸ Cavendish (1999).

⁹ Duraiappah (1996).

In developing countries, land is mostly used for agriculture, and is likely to be the greatest influence on the status of environmental quality. The main sustenance of poor people in developing countries is agriculture, which uses large amounts of environmental resources.¹⁰ “Low income forces the users to increase the resource use in order to survive, which again diminishes the natural resource base.”¹¹ This seems particularly so where the poor lack the ability to replenish good soil, thus resulting in nutrient depletion and soil erosion.¹² Some poor farmers in Asia have used animal manure to replenish the lands up until fuel supplies became depleted. Once the fuelwood supplies became depleted, animal manure became the fuel substitute. “The poor farmer is left with very little choice when he is forced to make a trade-off between the immediate demands of fuel for cooking and heating or manure for the land.”¹³

Pressure is placed on natural resources by the poor through “population growth, limited access to land or access only to poor quality or fragile lands, or limited resources for investment and sustainable resource management.”¹⁴ Those impoverished have a need to concentrate resources on lower value food crops to ensure sustenance security and have a hard time obtaining investment resources.¹⁵

Land tenure also has an impact on the environment. Many poor farmers do not actually own the land to which they farm. “Lack of secure land tenure [has been cited] as the primary reason for poor farms to cultivate their land excessively to exhaustion; for

¹⁰ Scherr (1999).

¹¹ Angelsen (1997).

¹² *Id.* at 143.

¹³ Duraiappah (1996).

¹⁴ Scherr (2000).

¹⁵ Scherr (2000).

the simple reason that they have no vested interest in preserving an asset to which they do not own.”¹⁶

It is important to note though that “[w]ealthier farmers, developers, and multinational corporations typically control greater total land area and play a prominent role in many types of environmental degradation.”¹⁷ For example, overgrazing - with overgrazing, the poor are less likely to have the ability to have as much livestock as those who have more money, thus overgrazing is likely to be caused by the wealthy who have more livestock.¹⁸ “However, the poor play a significant role in unsustainable agricultural intensification, expansion on farming into marginal lands and vegetative overexploitation and the consequences for their livelihood can be more serious because they lack assets to cushion the effects.”¹⁹

Environmental degradation occurs in rural poor areas as well as urban poor areas. Specifically in Zimbabwe, “[i]n the urban slums, absence of waste disposal, sanitation and other essential service are just not a health risk to the poor but also a cause of ecological damage as human and wastes generated in the slums may destroy vegetation and pollute both surface and underground water.”²⁰

Many urban settings in developing countries share the same concerns. “Effluents and industrial wastes dumped into river waters, excessive withdrawal of water, agricultural runoff containing pesticides that eventually find its way into drinking water supplies in urban areas, and religious and social practices such as disposing animal carcasses and household wastes into rivers. Noxious fumes from burning garbage containing plastics and other toxins plague air quality in many cities in developing

¹⁶ Duraiappah (1996).

¹⁷ Scherr (2000).

¹⁸ Angelsen (1997).

¹⁹ *Id.* at 480.

²⁰ Zimbabwe's National Report on the Implementation of the NAP Process in the Context of the United Nations Convention to Combat Desertification.

countries.”²¹ Again, specifically to Zimbabwe, the growth of the urban sector has contributed to the environmental degradation of land, air and water.²²

Sanjeev Prakash in “Poverty and Environment Linkages in Mountains and Uplands: Reflections on the ‘Poverty Trap’ Thesis” examines the poverty trap, which holds that “mainly due to inherent short time horizons and risk, poverty encourages over-exploitation of the physical environment which results in further impoverishment.”²³ Three possible factors of environmental degradation are analysed: “i) short time-horizons and low resilience to risk; ii) population growth; iii) technology and technological change.”²⁴

To examine these factors very briefly, the first factor points to what may be the inability of the poor to conserve what they will need in the future along with a high reliance on resources that results in environmental degradation. For example, the need to cut down trees to supplement a lack of crop yields or income will erode the natural resource supply of trees.²⁵ The second factor looks to the idea that poverty may lead to high fertility, which causes population growth. With population growth, there is increased consumption and increased consumption requires a greater demand for natural resources.²⁶ The third factor of technology and technological change are factors that can actually erode the environment but it is those who are impoverished who lack the means to combat the adverse effects that technology and technological change can bring about.²⁷

Ultimately, after analysing the various factors, Prakash suggests, “that poverty is not so much a cause of environmental degradation as a *mechanism* by which the true

²¹ Bucknall, Kraus and Pillai (2001).

²² Zimbabwe's National Report on the Implementation of the NAP Process in the Context of the United Nations Convention to Combat Desertification.

²³ Prakash (1997).

²⁴ *Id.* at 4.

²⁵ *Id.* at 5.

²⁶ *Id.* at 7.

underlying causes are transformed into actions that degrade the environment. In other words, environmental degradation is a negative externality whose causal roots, as well as solutions, lie in institutional and policy issues rather than in poverty itself.”²⁸ Others have also come to the conclusion that it is not poverty that is the direct cause of environmental degradation.

Bardhan, Baland, Das, Mookherjee, and Rinki (hereinafter Bardhan) “examine the determinants of firewood collection of households in 215 rural wards in Nepal, based on the 1995-95 Living Standards Measurement Survey” in regard to the application of the major problem of deforestation which affects many developing countries today.²⁹ Bardhan notes that evidence does not support the theory that it is poverty itself that causes environmental degradation, but the evidence takes a step further and looks to the various aspects of growth and commercialisation.³⁰

“Rising consumption levels tend to raise firewood collections owing to the significance of wealth over substitution effects, with an aggregate elasticity that appears close to unity.”³¹ It is contended that the wealthier households have a higher demand for cooking and heating than the poorer households do and without alternative fuels, wealthier households use greater amounts of firewood. Evidence also suggests that collections also tend to be greater in more prosperous villages.³² But one must also look to changes in agricultural activities and the availability of commercial fuel substitutes.³³ In viewing the overall evidence, it is evident that it is not only poverty that contributes to environmental degradation, but the lack of access to environmentally friendly

²⁷ *Id.* at 14.

²⁸ *Id.* at 3.

²⁹ Bardhan, Baland, Das, Mookherjee and Sarkar (2001).

³⁰ *Id.* at 4.

³¹ *Id.* at 49.

³² *Id.* at 5.

³³ *Id.* at 50.

alternatives. Lack of access to these amenities in turn intensifies poverty, by increasing the cost of securing access to more environmentally destructive alternatives.

Reardon and Vosti note that while some environmental degradation in developing countries may be linked to poverty, not all can. In those places where there are links of poverty to environmental degradation, the links are often very complex and not easily addressed. Any efforts to address these links have been too general to give any hard evidence.³⁴ Their article “addressed this issue by: decomposing poverty into asset categories; decomposing the physical resource endowment/environment; showing how poverty types and levels affect household livelihood activities and investment decisions, which in turn affect the environment; showing what factors (external to the household) condition the links.”³⁵

As has been discussed, there are various opinions in regards to whether or not poverty causes environmental degradation. Some take the view that it is poverty that is the major cause of environmental degradation; while others maintain that it is those better off who are the source of the degradation. Yet others are of a different opinion, and view a combination of those impoverished and well off to be the major cause of environmental destruction.

Due the fact that many developing countries are dependent on their natural resource base, steps need to be taken to preserve and generate this base. “Efficient and sustainable management of this ‘natural’ capital is essential for these countries to achieve long-term growth and development.”³⁶ When considering various policy action to reduce land degradation, “[t]he classic view proposes a simple control of population

³⁴ Reardon and Vosti (1995).

³⁵ *Id.*

³⁶ Barbier (1999).

through educational campaigns and contraceptive administration, technology transfer, and stringent and extensive land and water conservation programmes.”³⁷

Further programmes need to be put in place to support those who cannot help themselves. Such programmes can perhaps provide compensation for the poor to act as an incentive when those that are impoverished conserve and manage resources. Technologies will probably be needed for doing so.³⁸

3. THE POVERTY-ENVIRONMENT RELATIONSHIP IN THE SOUTH AFRICAN CONTEXT

In order to explore the relevance of the issues discussed in the previous section to South Africa, data from the 1999 October Household Survey was analysed. The sample was divided into eight expenditure categories³⁹, plus those households who did not know or refused to answer the questions posed. The analysis examines the linkages between poverty and access to environmentally friendly amenities. This section analyses access to and sources of water, heat, lighting, cooking, fuel, refuse removal, and sanitation.

3.1 ACCESS TO SOURCES OF WATER

Access to clean water is one of the most important environmental amenities. The major sources of water for the poorest households are piped water on site and public taps. As shown in Table 1, 34.52% of households (less than R400) depend on piped water on site, and 26.38% of households depend on public taps for water.

³⁷ Yao, Joseph Awetori.

³⁸ Scherr (2000).

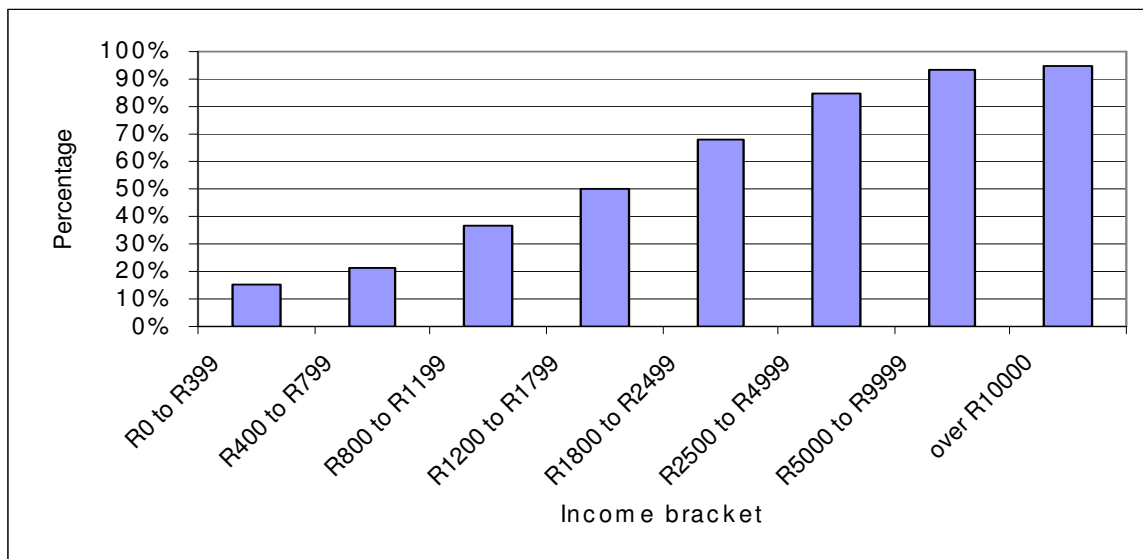
³⁹ The following expenditure categories were used: R0 to R399; R400 to R799; R800 to R1199; R1200 to R1799; R1800 to R2499; R2500 to R4999; R5000 to R9999 and over R10 000.

Table 1: Access to sources of water

Expenditure bracket	Piped water in dwelling	pipd water on site	Public tap	stream, dam, pool or stagnant water	borehole	well or spring	other
R0 to R399	15.48%	34.52%	26.38%	9.88%	3.92%	6.17%	3.48%
R400 to R799	21.00%	32.94%	23.02%	9.22%	4.41%	5.92%	1.68%
R800 to R1199	36.36%	29.91%	16.44%	6.67%	3.89%	4.11%	1.21%
R1200 to R1799	49.81%	29.66%	11.80%	2.48%	2.60%	2.04%	0.76%
R1800 to R2499	68.05%	16.39%	6.78%	1.75%	2.72%	2.11%	0.57%
R2500 to R4999	84.79%	8.35%	3.44%	0.65%	1.31%	0.61%	0.29%
R5000 to R9999	93.35%	3.59%	0.65%	0.20%	1.20%	0.25%	0.09%
Over R10000	94.86%	2.87%	0.22%	0.33%	0.97%	0.00%	0.00%
Don't know	49.63%	22.79%	13.53%	3.86%	3.16%	4.40%	1.15%
Refuse to answer	89.21%	7.11%	1.92%	0.87%	0.73%	0.00%	0.15%
All households	38.69%	27.03%	17.34%	6.40%	3.40%	4.27%	1.23%

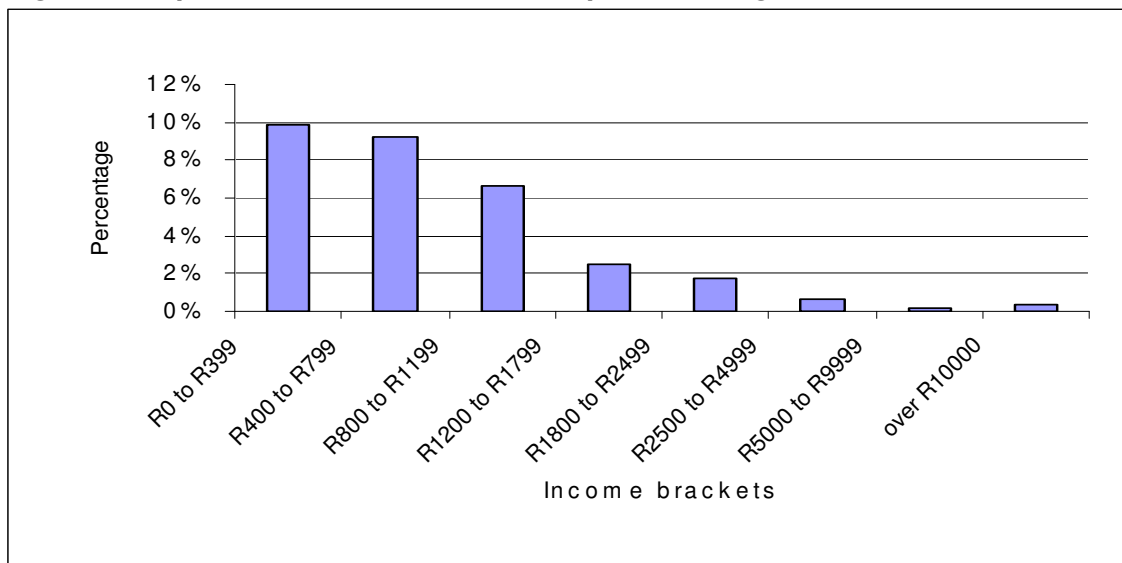
38.69% of households have piped water in dwelling. Of the households with the highest expenditure rates (over R10,000), 94.86% have piped water in dwelling. Of the households with the poorest expenditure rates (less than R400), 15.48% have piped water. 21% of the second poorest households (between R400 and R799) have access to piped water (see Figure 1).

Figure 1: Access to piped water in dwelling



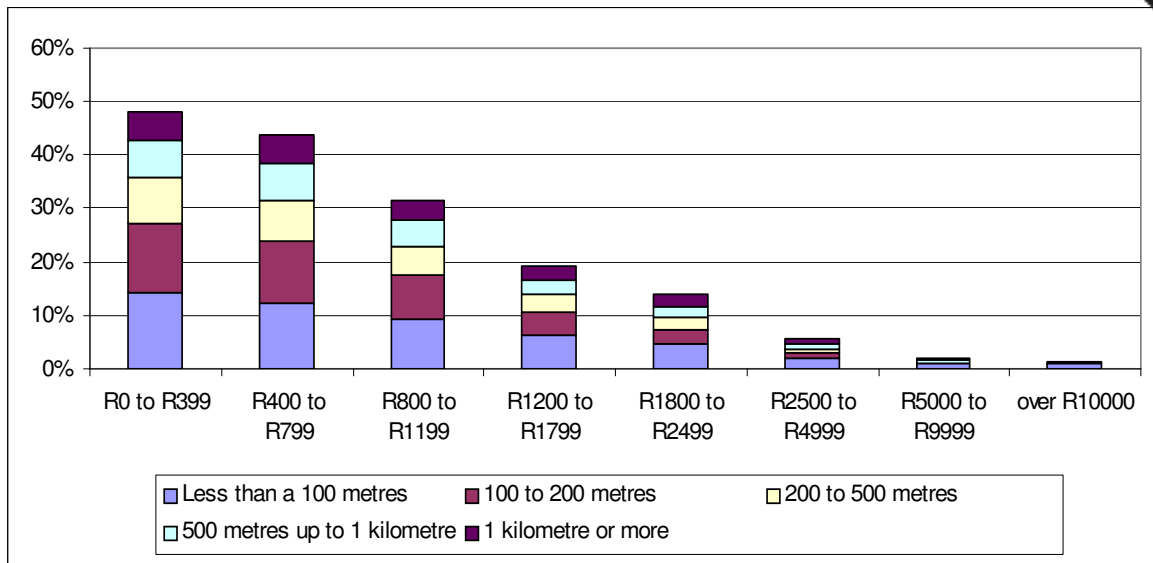
Most of the poor have to rely on water sources other than piped water in dwelling. 9.88% of the poorest households depend on water from streams, dams, pools or stagnant water, compared to 0.33% of the wealthiest households (see Figure 2). Environmental degradation makes reliance on streams, dams, pools or stagnant water very costly for the poor. Water containing pollutants negatively affects the health of the individuals accessing it. Poor health is particularly difficult for the poor to manage given their limited incomes and education.

Figure 2: Dependence on streams, dams, pools or stagnant water



Nearly half (48%) of the poorest households (less than R400) have to travel for water. The situation is similar for the second poorest households (between R400 and R799) – nearly 45% have to travel for water. Only about 1% of upper income individuals have to travel for water and nearly all of these have to travel less than 100 metres. For the poorest households, 5.35% have to travel 1 kilometre or more for water (see Figure 3).

Figure 3: Distance to water source



3.2 ACCESS TO SOURCES OF HEAT

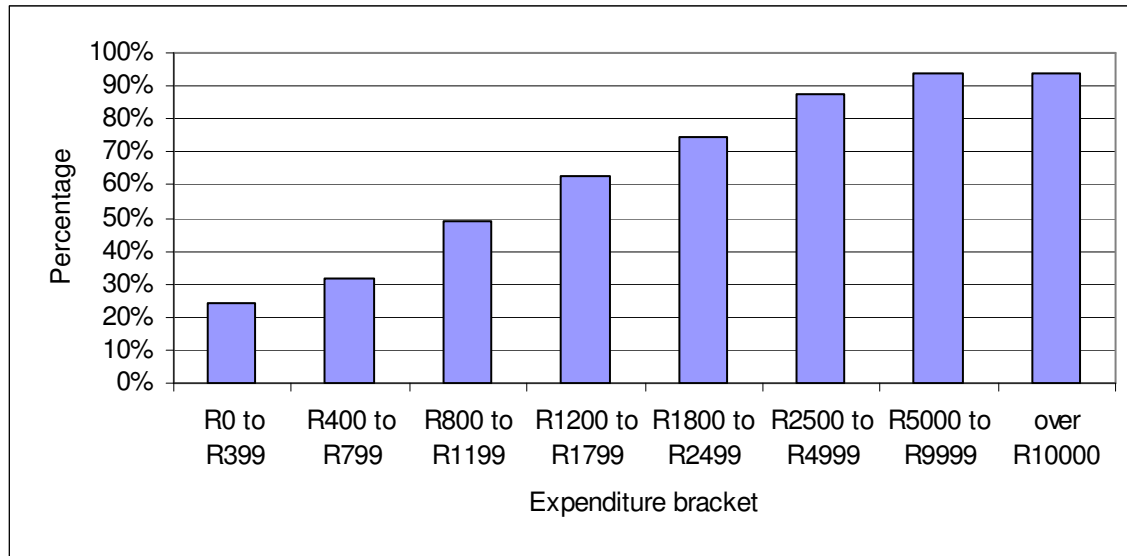
Table 2 shows that 47.43% of all households have access to heat via electricity. 97.93% of high income households depend on electricity for heat, while only 24.39% of the poorest households use electricity for heat.

Table 2: Access to sources of heat

Expenditure bracket	Electric (mains)	paraffin	Wood	coal	other	none
R0 to R399	24.39%	19.48%	33.85%	6.53%	1.56%	13.36%
R400 to R799	31.76%	15.95%	32.13%	7.32%	1.66%	10.67%
R800 to R1199	49.34%	14.45%	18.36%	5.67%	1.43%	10.01%
R1200 to R1799	62.45%	12.21%	10.05%	5.19%	0.82%	8.84%
R1800 to R2499	74.65%	8.44%	5.55%	3.07%	1.06%	6.72%
R2500 to R4999	87.80%	2.72%	2.51%	1.28%	1.44%	3.90%
R5000 to R9999	93.63%	1.35%	1.60%	0.31%	0.98%	2.03%
Over R10000	93.63%	0.27%	1.14%	0.16%	2.70%	1.47%
Don't know	54.40%	8.75%	16.25%	5.25%	1.19%	13.25%
Refuse to answer	90.06%	2.60%	3.40%	0.85%	0.00%	2.59%
All households	47.43%	13.34%	21.82%	5.37%	1.42%	9.85%

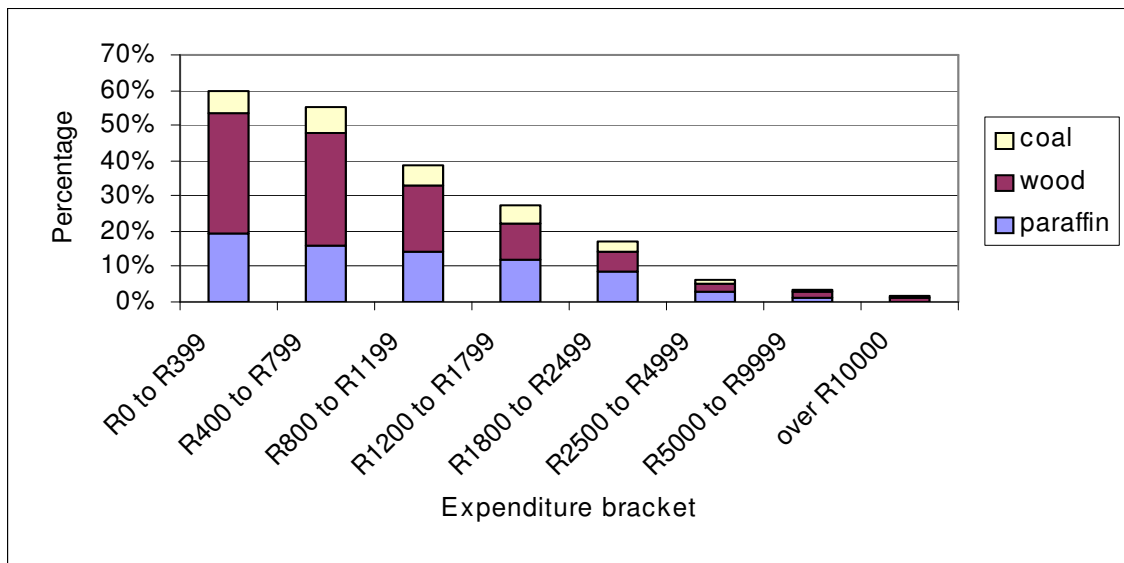
The poorer a household is, the less likely they are to have electric mains (see Figure 4).

Figure 4: Access to electricity for heat



Wood, with all its environmental costs, is the primary source of heating fuel for the poorest groups. 33.85% of the poorest use wood as the primary fuel for heating. 19.48% of the poorest groups use paraffin, and 6.53% use coal (see Figure 5). Animal dung is not frequently reported as a primary fuel source, but research in extremely poor regions documents that it is a major secondary source.⁴⁰

⁴⁰ Sogaula *et al* (2002).

Figure 5: Access to paraffin, wood and coal for heat

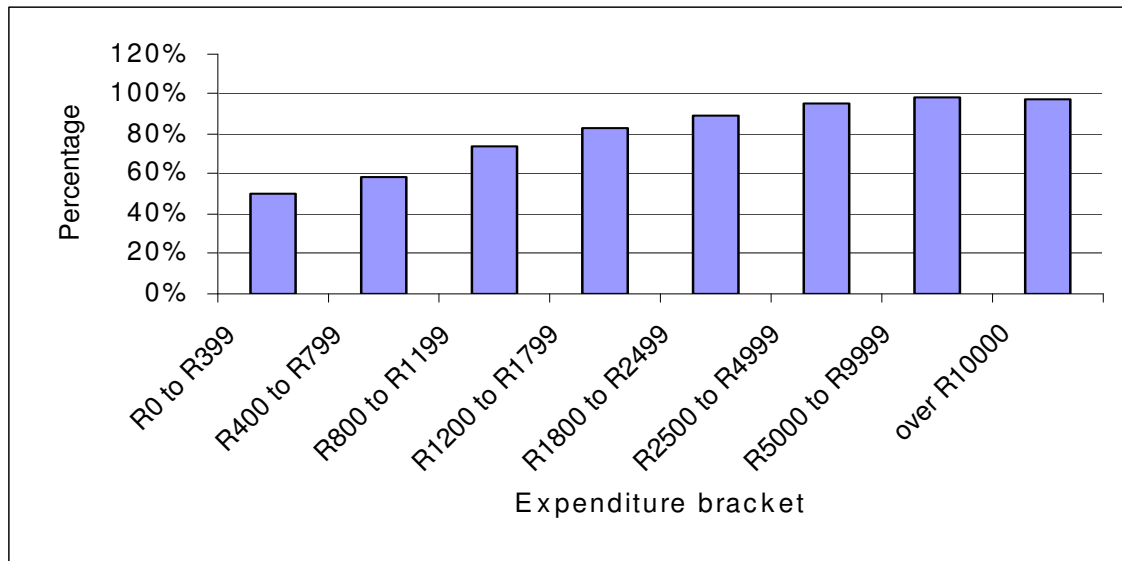
3.3 ACCESS TO SOURCES OF LIGHTING

Households with the greatest access to electricity for lighting purposes are the high income households (more than R10,000). Table 3 shows that of the 69.20% of households who use electricity for lighting, 97.93% are the wealthiest households, and 50.63% are the poorest households (less than R400). This finding is graphically shown in Figure 6.

Table 3: Access to sources of lighting

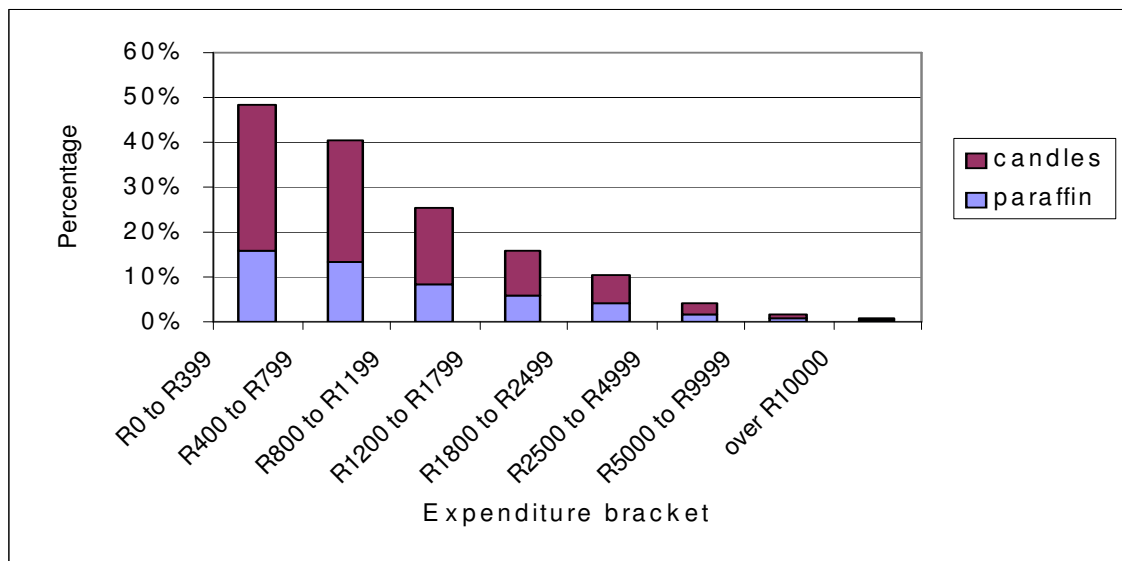
Expenditure bracket	Electric (mains)	Paraffin	Candles	other	None
R0 to R399	50.63%	15.84%	32.70%	0.46%	0.09%
R400 to R799	58.78%	13.18%	27.09%	0.64%	0.07%
R800 to R1199	73.84%	8.35%	16.94%	0.73%	0.06%
R1200 to R1799	83.42%	5.65%	10.07%	0.66%	0.08%
R1800 to R2499	89.18%	4.15%	6.43%	0.15%	0.09%
R2500 to R4999	95.57%	1.69%	2.33%	0.22%	0.16%
R5000 to R9999	98.01%	0.68%	1.08%	0.22%	0.00%
Over R10000	97.93%	0.58%	0.31%	1.18%	0.00%
Don't know	76.39%	6.79%	16.21%	0.45%	0.00%
Refuse to answer	95.30%	0.83%	3.65%	0.00%	0.00%
All households	69.20%	9.84%	20.04%	0.52%	0.07%

Figure 6: Access to electricity for lighting



Because many poor households are not electrified, almost 50% of the poorest households depend on paraffin and candles for light. Figure 7 shows that 15.84% of the poorest households depend on paraffin; and 32.7% depend on candles for light. The burning of paraffin and candles for sources of light contributes to environmental degradation through air pollution.

Figure 7: Access to paraffin and candles for lighting



3.4 ACCESS TO SOURCES OF COOKING

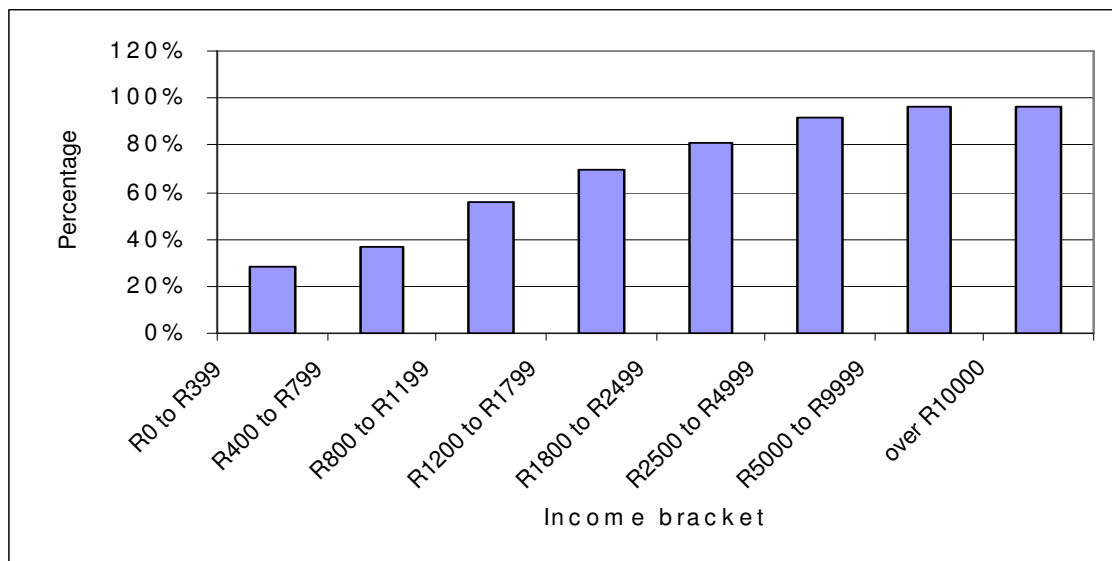
Electricity is used by most wealthy households for cooking, 96.32% of the wealthiest households can access electricity in order to cook (see Table 4).

Table 4: Access to sources of cooking

Expenditure bracket	electric (mains)	Paraffin	wood	coal	other	none
R0 to R399	28.29%	32.86%	31.22%	3.22%	3.16%	1.01%
R400 to R799	36.93%	26.60%	28.50%	3.82%	3.89%	0.24%
R800 to R1199	55.71%	20.26%	15.88%	2.66%	4.97%	0.40%
R1200 to R1799	69.50%	15.27%	8.30%	2.27%	3.16%	0.99%
R1800 to R2499	81.18%	9.17%	4.75%	1.47%	3.29%	0.24%
R2500 to R4999	91.91%	3.00%	1.87%	0.56%	2.31%	0.35%
R5000 to R9999	96.28%	1.15%	1.26%	0.00%	0.95%	0.19%
Over R10000	96.32%	0.52%	0.69%	0.00%	2.47%	0.00%
Don't know	60.88%	16.85%	15.61%	2.74%	3.78%	0.20%
Refuse to answer	93.17%	3.41%	1.71%	0.27%	1.44%	0.00%
All households	52.50%	21.06%	19.56%	2.65%	3.19%	0.51%

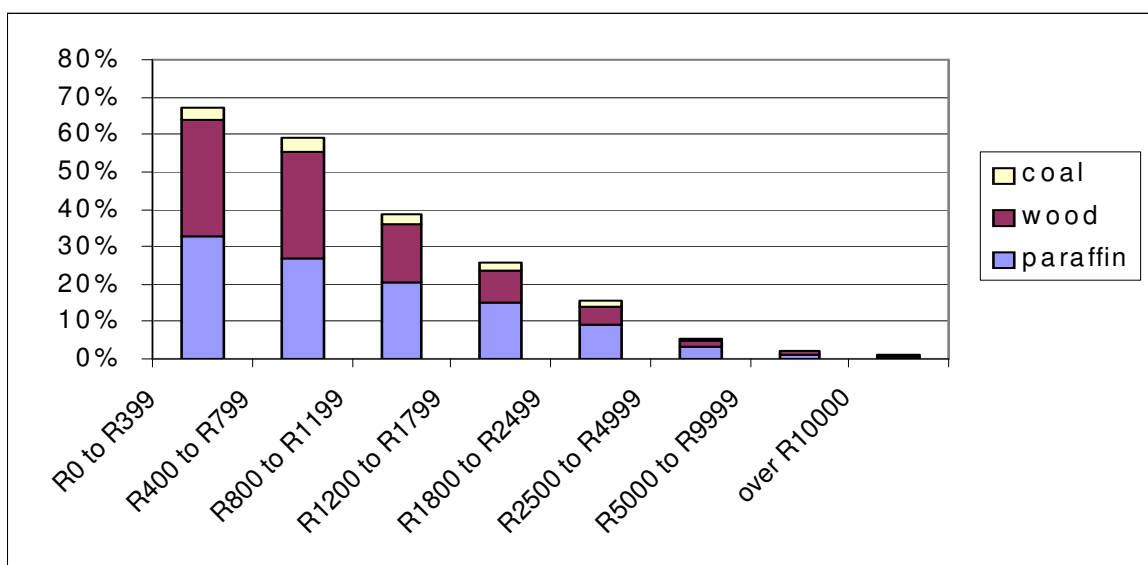
Figure 8 clearly shows that the poorer a household is, the less they are able to access electricity for cooking purposes – 28.29% of the poorest households access electricity to cook.

Figure 8: Access to electricity for cooking



Many poor individuals rely on coal, wood and paraffin for cooking (see Figure 9). Access to these sources differs slightly among poor households. For the poorest households, paraffin is mostly relied upon, 32.86% depend on paraffin for cooking. For the second poorest households, wood is mostly relied upon, 28.50% rely on wood for cooking (compared to 26.60% for paraffin). The heavy reliance on such sources also harms the environment through air pollution (two thirds of the poorest households depend on paraffin and wood for cooking).

Figure 9: Access to paraffin, wood and coal for cooking



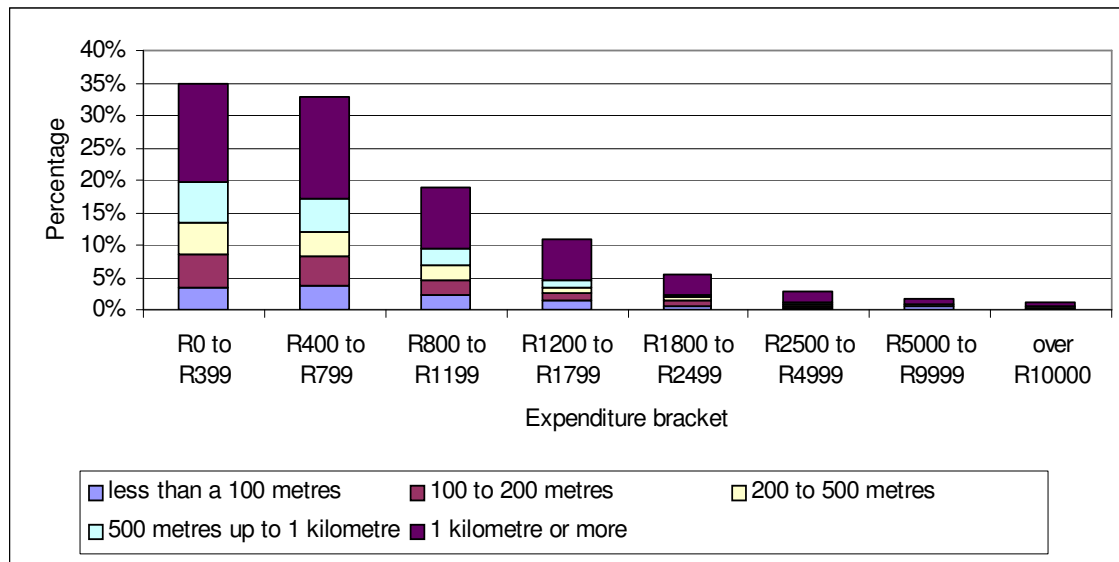
Poor people living in the poorest households (14.98%) and second poorest households (15.69%) have to travel 1 kilometre or more to access fuel (see Table 5).

Table 5: Travelling distance to access fuel

Expenditure bracket	less than a 100 metres	100 to 200 metres	200 to 500 metres	500 metres up to 1 kilometre	1 kilometre or more	Not applicable
R0 to R399	3.44%	5.13%	4.94%	6.30%	14.98%	63.54%
R400 to R799	3.75%	4.48%	3.81%	5.19%	15.69%	65.61%
R800 to R1199	2.31%	2.24%	2.32%	2.67%	9.21%	80.04%
R1200 to R1799	1.40%	1.14%	0.87%	1.27%	6.04%	88.86%
R1800 to R2499	0.68%	0.76%	0.47%	0.48%	3.18%	94.10%
R2500 to R4999	0.23%	0.37%	0.16%	0.31%	1.74%	96.87%
R5000 to R9999	0.54%	0.14%	0.10%	0.04%	0.91%	98.20%
over R10000	0.21%	0.00%	0.45%	0.00%	0.48%	98.86%
don't know	2.80%	1.94%	2.63%	2.40%	7.15%	82.01%
Refuse to answer	0.90%	0.88%	0.00%	0.74%	0.16%	96.43%
All households	2.53%	3.06%	2.82%	3.61%	10.40%	76.44%

For 35% of the poorest households, accessing fuel requires travelling distances ranging from less than 100 metres to over a kilometre, as represented in Figure 10. In contrast, for wealthier households, accessing fuel does not require travelling much distance.

Figure 10: Travelling distance to access fuel



3.5 ACCESS TO REFUSE REMOVAL SERVICES

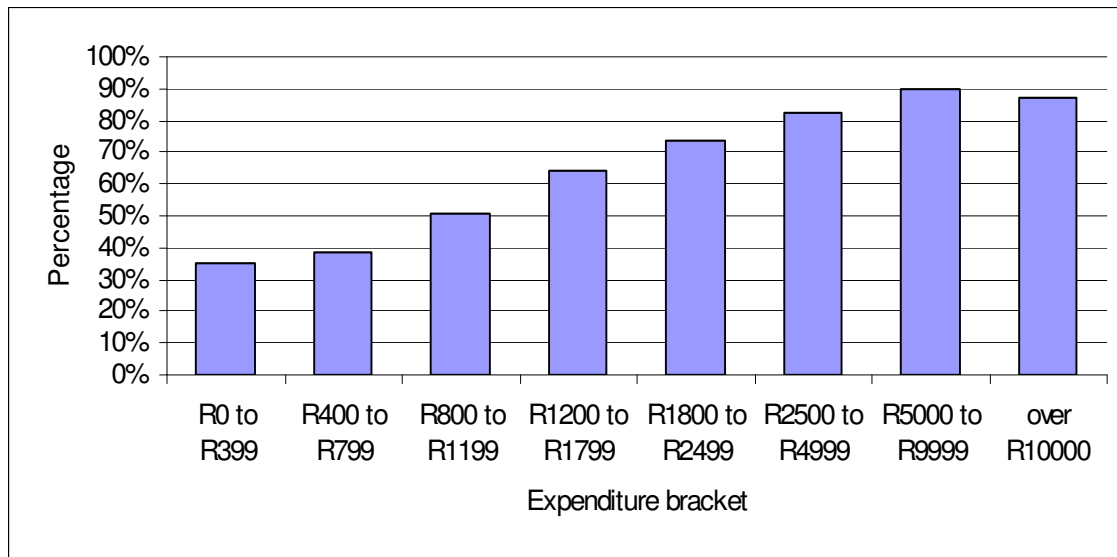
The local authorities provide refuse removal services to 51.87% of households (see Table 6). The households that benefit the most from these services are the wealthy.

Table 6: Access to sources of refuse removal

Expenditure bracket	local authorities at least once/week	local authorities less than once/week	community members at least once/week	community members less than once/week	Community dump	own dump	no removal	other
R0 to R399	35.38%	3.04%	0.94%	0.56%	3.55%	45.23%	10.11%	0.65%
R400 to R799	38.28%	2.33%	1.17%	0.47%	3.46%	44.42%	8.82%	0.57%
R800 to R1199	50.84%	3.26%	1.01%	0.40%	3.51%	32.72%	6.79%	0.69%
R1200 to R1799	63.87%	3.98%	0.95%	0.21%	4.49%	21.11%	4.19%	0.89%
R1800 to R2499	73.41%	4.14%	0.71%	0.13%	1.70%	15.43%	3.81%	0.41%
R2500 to R4999	82.72%	3.12%	0.43%	0.06%	1.30%	9.29%	2.07%	0.45%
R5000 to R9999	89.65%	1.90%	0.29%	0.15%	0.60%	6.17%	0.51%	0.31%
over R10000	87.44%	2.07%	0.15%	0.00%	0.66%	8.39%	0.80%	0.00%
don't know	62.20%	2.44%	0.84%	0.37%	1.93%	24.78%	6.94%	0.21%
Refuse to answer	86.04%	2.32%	0.62%	0.24%	0.00%	8.12%	0.97%	1.40%
All households	51.87%	2.92%	0.90%	0.38%	2.99%	32.72%	6.94%	0.58%

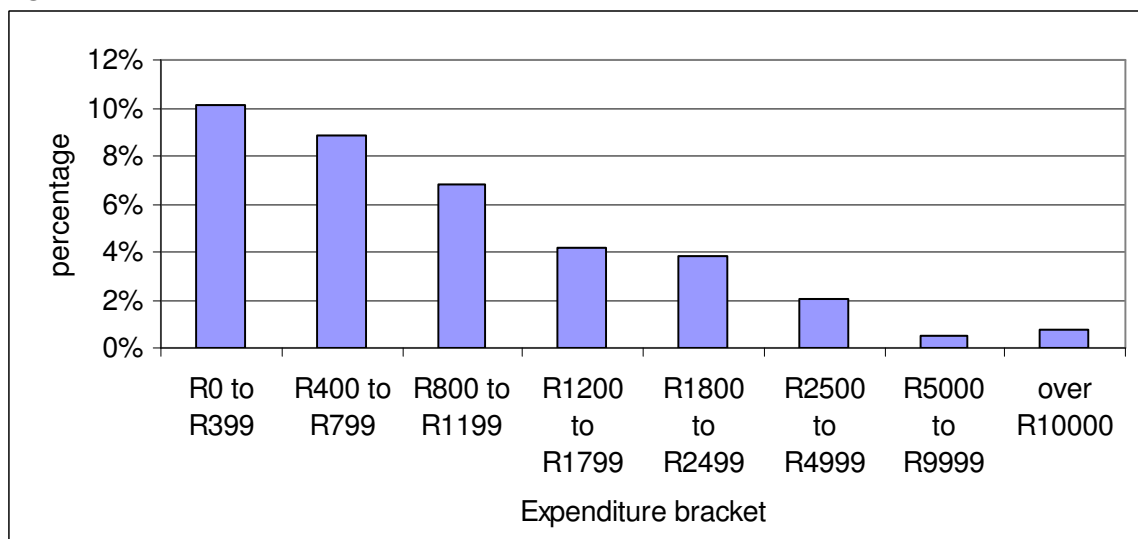
Figure 11 provides a graphical representation of regular refuse collection services offered to households. It can be seen that 87.44% of the wealthiest households receive regular refuse collection services, compared to only 35.38% of the poorest households.

Figure 11: Regular refuse collection



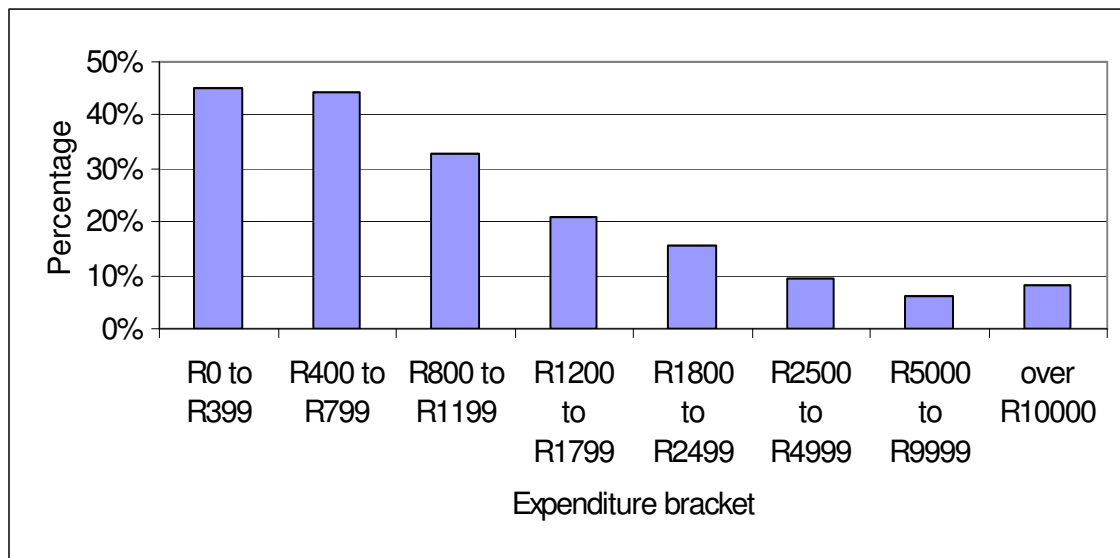
Not only is refuse not collected from many poor households on a regular basis by the local authorities, but for many poor households, their refuse is not removed at all. This can be seen in Figure 12. Refuse in 10.11% of the poorest households is not removed.

Figure 12: No refuse removal



A large percentage of poor households utilise their own dumps for refuse removal purposes. 45.23% of the poorest households remove their refuse by making use of their own dumps, compared to 8.39% of the wealthiest households (see Figure 13).

Figure 13: Refuse removal via own dumps



The lack of refuse removal services among poor households causes environmental harm. The absence of refuse removal services destroys natural resources and harms the environment.

3.6 ACCESS TO SANITATION FACILITIES

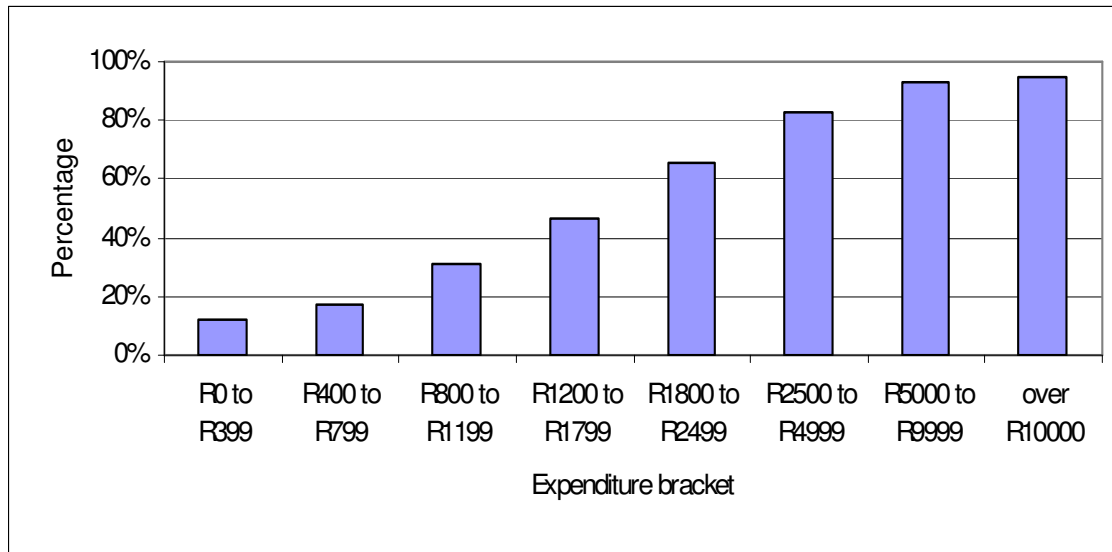
35.11% of all households access “in dwelling” flush toilets (see Table 7). The percentage of poor households who can access these toilets is very low, only 11.65% for the poorest households, compared to 94.79% of the wealthiest households.

Table 7: Access to toilet facilities

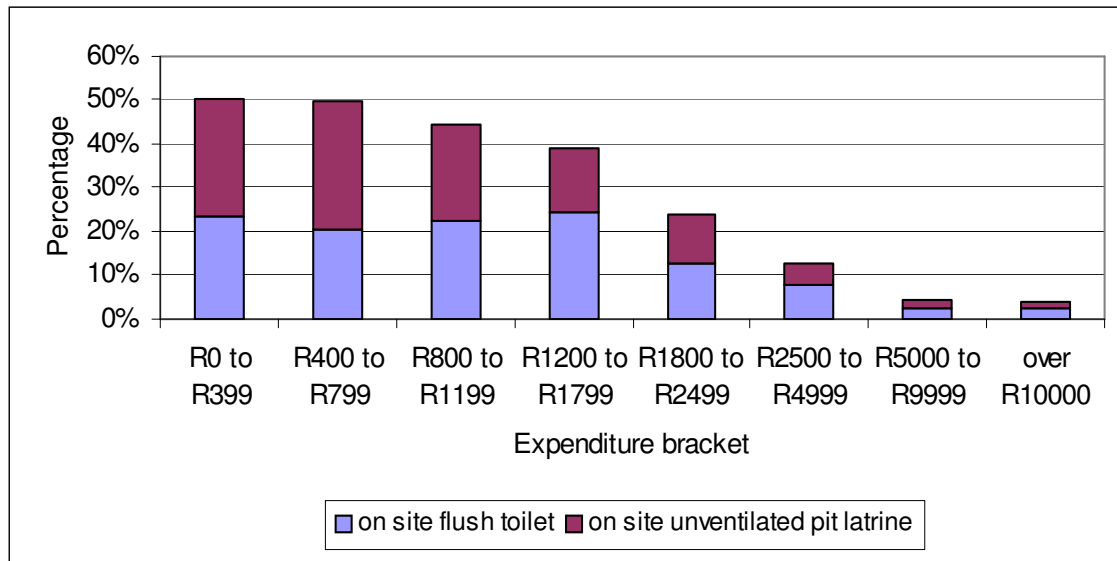
Expenditure bracket	in dwelling flush toilet	on site flush toilet	on site chemical toilet	on site ventilated pit latrine	on site unventilated pit latrine	on site bucket toilet	other	none
R0 to R399	11.65%	23.39%	0.48%	3.97%	26.77%	3.13%	13.03%	17.39%
R400 to R799	16.92%	20.64%	0.30%	4.64%	29.19%	3.05%	12.38%	12.57%
R800 to R1199	31.08%	22.33%	0.32%	4.63%	22.13%	2.97%	9.36%	6.95%
R1200 to R1799	46.15%	24.48%	0.15%	3.31%	14.41%	2.03%	6.28%	2.96%
R1800 to R2499	65.37%	12.74%	0.22%	2.56%	10.98%	1.72%	4.27%	1.98%
R2500 to R4999	82.55%	7.67%	0.16%	1.43%	5.08%	0.43%	2.29%	0.24%
R5000 to R9999	93.45%	2.22%	0.09%	0.63%	2.40%	0.18%	0.66%	0.00%
Over R10000	94.79%	2.63%	0.08%	0.52%	1.20%	0.00%	0.65%	0.14%
Don't know	45.98%	16.30%	0.20%	4.02%	16.55%	2.03%	7.90%	6.96%
Refuse to answer	89.25%	5.04%	0.00%	1.10%	2.05%	0.00%	1.26%	1.31%
All households	35.11%	18.81%	0.30%	3.66%	20.67%	2.41%	9.25%	9.40%

This inequitable access to toilet facilities is graphically represented in Figure 14. 13.03% of the poorest households access off site toilet facilities. The table reveals that 17.39% of poor households do not have any toilet facilities.

Figure 14: Access to in dwelling flush toilets



Due to the lack of in dwelling toilet facilities in poor areas, most of the poorest households access on site unventilated pit latrines as well as on site flush toilets. Figure 15 shows that approximately half of the two poorest groups of households make use of these facilities.

Figure 15: Access to on site flush toilet and unventilated pit latrine

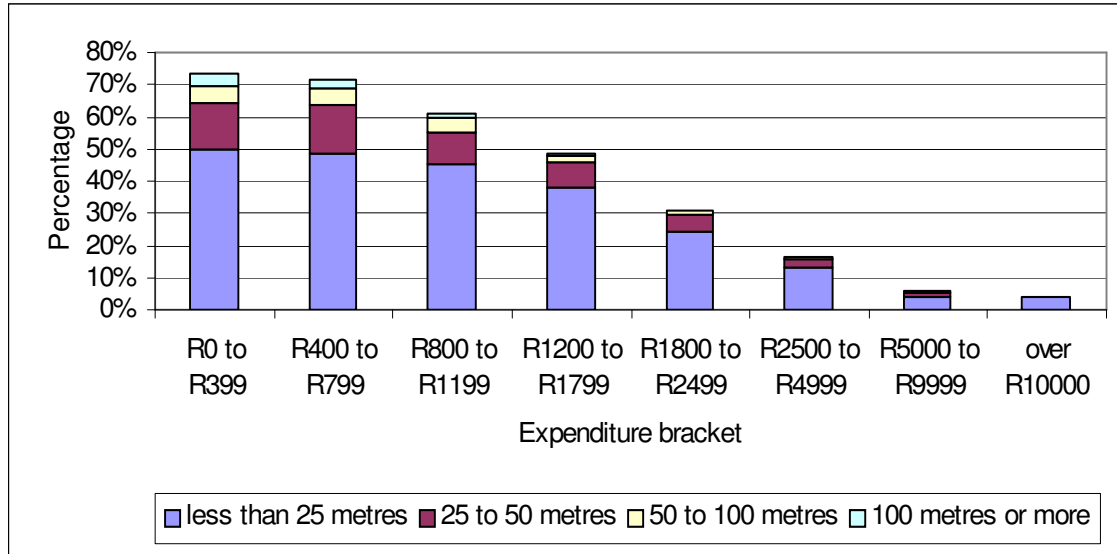
Although a small percentage of the poorest households (3.58%) travel over 100 metres to access toilet facilities, no individuals living in the wealthiest households have to travel such a distance to access toilets (see Table 8).

Table 8: Travelling distance to access toilet facilities

Expenditure bracket	less than 25 metres	25 to 50 metres	50 to 100 metres	100 metres or more
R0 to R399	50.13%	14.11%	5.46%	3.58%
R400 to R799	48.32%	15.32%	4.93%	2.69%
R800 to R1199	45.11%	10.21%	4.07%	1.92%
R1200 to R1799	37.77%	8.37%	1.76%	0.88%
R1800 to R2499	24.25%	4.93%	1.62%	0.27%
R2500 to R4999	12.96%	2.48%	0.65%	0.16%
R5000 to R9999	4.22%	1.21%	0.30%	0.00%
over R10000	3.83%	0.25%	0.13%	0.00%
don't know	30.86%	10.49%	4.22%	0.90%
refuse to answer	6.93%	1.10%	0.00%	0.00%
All households	39.00%	10.78%	3.76%	2.01%

What Figure 16 shows is that 73.28% of the poorest households have to travel distances from under 25 metres to over 100 metres. This compares to only 4.21% for the wealthiest households.

Figure 16: Travelling distance to access toilet facilities



The quality of sanitation facilities in low-income areas is very poor, compared to the quality of sanitation facilities in high-income areas. This lack of adequate sanitation facilities in poor areas causes ecological damage through, for example, polluting surface and underwater supply resulting from usage of unventilated pit latrines.

4. CONCLUSION

The poverty-environment relationship is mutually reinforcing because the lack of access to environmentally friendly amenities causes impoverished households to contribute to ecological damage; and environmental degradation contributes to the impoverishment of many poverty-stricken households.

This is evident in the October Household Survey analysis of household access to and sources of environmental amenities in South Africa. Many poor households are not electrified, and as such have to use alternative sources of environmentally unfriendly amenities. Dependence on coal, paraffin, wood and candles causes air pollution and other environmental damage (such as deforestation caused by accessing wood for heat

and cooking). Inadequate sanitation and refuse removal amenities further harm the environment by contaminating water supplies and polluting land.

The environmental damage resulting from the lack of access to environmentally friendly amenities increases poverty levels. Polluted water, land and air is a serious health problem for poor people. Sickesses and illnesses caused by pollution can only worsen their poverty situation.

The poverty-environment relationship has important policy implications. For social policy, the challenge is to increase environmentally friendly amenities for the poor, particularly potable water supply, flush sanitation and electricity.

BIBLIOGRAPHY

Ambler, John. "Attacking Poverty While Improving the Environment: Toward Win-Win Policy Options." 1999. <http://stone.undp.org/divs/seed/peifomm/ACF889.PDF>, pages 1-51.

Angelsen, Arild. "The Poverty-Environment Thesis: Was Brundtland Wrong?" *Forum for Development Studies* 1997, vol. 0(1), pages 135-154.

Barbier, Edward B. "Development, Poverty and Environment" in Handbook of Environmental Resource Economics. Cheltenham, U.K. and Northampton, Mass.: Elgar; distributed by American International Distribution Corporation Williston, Vt., 1999, pages 731-44.

Bardhan, Pranab; Baland, Jean-Marie; Das, Sanghamitra; Mookherjee, Dilip; Sarkar; Rinki. "Household Firewood Collection in Rural Nepal: The Role of Poverty, Collective Action and Modernization." 2001. <http://globetrotter.berkeley.edu/macarthur/inequality/papers/MookhNepal.pdf>.

Bucknall, Julia; Kraus, Christiane; Pillai, Poonam. "Poverty and the Environment." Environment Strategy Papers. September 2001. Pg. 15. [http://lnweb18.worldbank.org/essd/essd.nsf/GlobalView/Poverty%20and%20Environment.pdf/\\$File/Poverty%20and%20Environment.pdf](http://lnweb18.worldbank.org/essd/essd.nsf/GlobalView/Poverty%20and%20Environment.pdf/$File/Poverty%20and%20Environment.pdf)

Cavendish, William. "The Complexities of the Commons: Environmental Resource Demands in Rural Zimbabwe." Centre for the Study of African Economies Working Paper: WPS/99/08, 1999, pages 1-52.

Duraiappah, Anantha. "Poverty and Environmental Degradation: a Literature Review and Analysis." CREED Working Paper Series No 8, October 1996. www.iied.org/pdf/creed08e.pdf.

Heady, Christopher. "Natural Resource Management and Poverty Reduction. Department of Economics and International Development, University of Bath. April 1998. <http://www.feem.it/gnee/pap-abs/heady.pdf>, pages 1-24.

Reardon, Thomas; Vosti, Stephen A. "Links Between Rural Poverty and the Environment in Developing Countries: Asset Categories and Investment Property." *World Development*, vol. 23(9) September 1995. Pgs. 1495-1506.

Sogaula, Nonzwakazi; van Niekerk, Robert; Noble, Michael; Sigala, Maria; Mac Quene, Kenneth; Samson, Michael; van Niekerk, Ingrid; Green, Carolyn (2002) *Social Security*

Transfers, Poverty and Chronic Illness in the Eastern Cape: A Case Study of Mount Frere in the Eastern Cape. EPRI research paper.

Scherr, Sara J. "A Downward Spiral? Research Evidence on the Relationship between Poverty and Natural Resource Degradation." *Food Policy*. August 2000, vo. 25(4). Pages. 479-98.

Scherr, Sara J.. "Poverty-Environment Interactions in Agriculture: Key Factors and Policy Implications." 1999. <http://www.undp.org/seed/pei/publication/agriculture.htm>, pg. 2.

Yao, Joseph Awetori. "Poverty and Land Degradation Linkages: A Theoretical Perspective." Pg. 23. <http://folk.uio.no/josephy/articles/povertenvi.doc>