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The importance of Gender in Energy Decision making: the case of Rural Botswana

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Abstract

The government of Botswana is rapidly expanding the availability of electricity to rural areas, but the extent to which this will benefit the general population remains uncertain. The paper investigates information on energy use in rural Botswana to see if the gender of decision makers in households affects the choice of energy. The information from survey data is examined in the broader context of Botswana's rapid economic and social development including the governments various commitments to reduce poverty and expand economic opportunities for women. There is some support for the hypothesis that female decision makers are more likely to opt for modern energy, but this is highly qualified due to limitations with the data. The research needs to be continued to take account of this and to investigate the impact of gender in the choice of energy in rural businesses.

Keywords: *energy demand, household decision-making, poverty reduction, gender issues, economic development*

Introduction

The economic achievements of Botswana, where highly regarded development policies have extended the benefits of rapid economic growth throughout the population, are well documented. However, serious challenges for development remain, as indicated by continuing high rates of poverty and unemployment; while the current HIV/AIDS epidemic threatens to undermine previous achievements. These problems are most pronounced in rural areas and female-headed households (FHHs). Rural development has long been accorded priority, but progress has been slow to the extent that some observers believe that there is little future for the rural economy. The particular problems faced by women are also recognised in principle; but, with some notable exceptions, women continue to be held back in what is, essentially, still a patriarchal society.

The extension of the national electricity grid to rural villages

has long been seen as a means to encourage rural development, and between 1999 and 2002 the government substantially accelerated the rural electrification programme. But this was driven by a general political imperative rather than based on any in-depth assessment of how such services would be utilised.

This paper looks at the question of whether the gender of the decision maker in rural households is a significant determinant of the choice of energy source: specifically, whether female decision makers are more likely to choose modern energy sources. If it is, then policies that enhance decision-making by women could both support the enhancement of women's agency capabilities and stimulate the creation of much needed income generating opportunities more widely. Examining this in the case of Botswana is particularly interesting given the interaction of rapid economic development with established cultural norms, which may make experience elsewhere less relevant. The analysis is based on data compiled for the government in 1999 to project energy demand patterns in the rural areas, which is examined here with specific reference to the issue of gender.

The paper is organised as follows. The next section sets the scene by examining relevant aspects of Botswana's economic and social development. The specific questions to be examined are then reviewed together with an assessment of the available data. After data analysis, the central findings are reported followed by concluding remarks.

Botswana's Economic and Social Development

Overview

Since independence in 1966, Botswana is widely cited as having the fastest average growth in the world^{*}; a variety

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^{*} Between 1974/75 and 2001/02 (the period for which consistent national accounts estimates are available), GDP growth averaged close to 9% per annum.

of academic studies have both attested to this success and have tried to explain it (see Salkin *et al.*⁽²⁾, Leith⁽³⁾, and Acemoglu *et al.*⁽⁴⁾). Channelled through the government, the proceeds from large-scale diamond mining[†] have been used prudently to further develop the economy and extend the benefits of rapid growth throughout the population. There is near universal access to safe drinking water, and to health and education facilities. Despite the vulnerability to drought, rates of malnutrition have been successfully reduced. At the same time, prudent economic management has led to the accumulation of financial assets in the form of foreign exchange reserves, which on a *per capita* basis, are among the highest in the world.⁻

The current HIV/AIDS epidemic has led to a worsening of some social indicators, and will put considerable strain on the national resources during the coming years. However, this has not dented the overall confidence in the Botswana economy, as indicated by the investment-grade sovereign credit ratings that were awarded in early 2001 and reaffirmed in 2002 (Bank of Botswana⁽⁶⁾).

Poverty and unemployment

However, despite this generally impressive track record, serious challenges for development remain, as indicated by continuing high rates of poverty and unemployment (see Table 1). These are most pronounced in rural areas and among females.

Table 1: Indicators of Poverty and Unemployment

Poverty (1993/94) ¹				
Total	Urban	Rural	MHH	FHH
38%	23%	48%	34%	41%
Unemployment (1995/96)				
	Labour force participation rate	Overall unemployment rate	Female/Male unemployment rates	
	55.5%	21.5%	1.2	

1. Poverty rates are expressed as a proportion of households

Sources: Jefferis⁽⁷⁾; Bank of Botswana⁽⁸⁾

The problem of poverty is exacerbated by the extent of the HIV/AIDS epidemic. According to UN data, Botswana has the highest rate of HIV infection in the world*. While this cuts across the whole population, the poorest are the worst affected as average incomes fall further and the problem of dependency is increased (BIDPA⁽⁹⁾).

The Botswana Government has set ambitious goals for poverty reduction, including the elimination of absolute pov-

erty by 2016 (Government of Botswana⁽¹⁰⁾). With assistance from the United Nations Development Programme (UNDP), a poverty alleviation programme is being put together and there is considerable pressure on the government to use its financial resources to fund programmes of social welfare support.

Energy policy and rural development

There is also pressure to 'roll out' services across the country, including the provision of utilities such as electricity and telecommunications outside urban areas. In part, this is driven by political imperatives, as the bedrock of the government support has been the loyalty of rural voters.*

In the case of energy, Table 2 gives some indication of the extent of urban/rural imbalances, showing the ownership of cookers and refrigerators in the mid-1990s. In urban areas, even among very poor households (cash income of approximately US\$30/month in 2001 prices), 39.6% had a cooker and 6% a fridge. But for the whole rural population, including higher income households, the figures were only 19.5% and 5.8%.

Table 2: Ownership of Household Items, 1993/94 (%)

	Very Poor	Overall
Urban: Cooker/stove	39.6	65.1
Fridge	6.0	31.5
Rural: Cooker/stove	3.3	19.5
Fridge	0.4	5.8

Source: 1993/94 Household Income and Expenditure Survey

A programme of rural electrification has been in place since the 1970s. During National Development Plan 8 (NDP8, 1997 – 2003), the policy was to electrify fourteen villages per year. In 1999 this was accelerated and a programme to cover 72 villages was completed in 2002, at an estimated cost of P183 million (approx US\$28 million). The driving force of this programme has been the general objective of extending the supply of services throughout the country, and the scope of the programme is typically expressed in terms of the total population covered in the areas connected. By the end of NDP 9 (in 2009), the aim is '...to move from 30 percent to 70 percent...in its [the

[†] Botswana is, by some margin, the largest producer of rough diamonds by value in the world.

⁻ As at the end of 2002, these reserves were sufficient to cover 26 months of imports of goods and services (Bank of Botswana⁽⁶⁾).

* According to the UNAIDS⁽¹¹⁾ report, 38.8% of the of 15 to 49-year olds were infected compared to 18% in 1992

* On this basis, the ruling Botswana Democratic Party has won every general election since independence in 1966

government's] quest to improve the quality of life of the general populace...'.[†] There is little by way of estimates of what the actual demand for such an expansion is likely to be. The government did commission a study on expected patterns of electricity demand (Zhou⁽¹²⁾), but this was completed only in 2001, too late to inform the decision to expand the programme.

It is recognised that low incomes prevailing in rural areas will limit the uptake of the new service. In 1995 the upfront payment required for a grid connection was reduced from 40% to 10%; in 2000 it was further reduced to 5% and the repayment period increased from 10 to 15 years. However, the extent that this was informed decision-making is doubtful. Whether such a repayment scheme fits with the requirement that the Botswana Power Corporation (BPC) should operate on commercial criteria, is unclear.* And if this initiative will be sufficient to provide effective outreach to the general population, has yet to be thoroughly investigated: even if the financing problem has been overcome, other constraints may need to be addressed.

The position of women

Table 3: Household Poverty Rates, 1993/94 (%)

	National	Rural
FHH	41	49
MHH	34	47

Source: Jefferis⁽¹⁴⁾

One such constraint may be the position of women in Botswana society. That they are a highly disadvantaged group economically is supported by the analysis of poverty: as already noted, poverty in FHHs was much higher than for male-headed households (MHHs) (see also Makgotle-Laletsang⁽¹³⁾). However, as seen from Table 3, the proportions of poor FHHs and MHHs in rural areas is very similar (49% to 47%). At first sight, these figures may seem to indicate that the 'rural' factor does not affect females most, but rather that a lack of income generating opportunities for all households is the major rural problem.

There may be some truth in this. But, in addition, FHHs are characterised by a vulnerability and lack of independence (Table 4). They were disproportionately reliant on remittances (from relatives etc). Even when the major income source was from business or employment, they were concentrated in the more marginal activities, such as businesses based on homemade products (e.g., brewing traditional beer) and where income was in kind rather than cash. Finally, dependency ratios in FHHs are significantly higher.

The lack of such capabilities may arise from either a lack of employment opportunities and/or too much time being

Table 4: Male and Female Households - Sources of Income and Dependency Rates, 1993/94 (%)

Main Source of Income	MHH	FHH
Business profit	59.9	40.1
o.w. own made goods	40.6	59.4
Cash earnings	63.3	36.7
Remittances	26.6	73.4
Income in kind	46.0	54.0
Dependency		
Dependency rate* < 3	56.6	43.2
Dependency rate* > = 3	36.8	63.2

* The dependency rate is the ratio of dependents (old and young) to working age adults in the household

Source: Central Statistics Office⁽¹⁵⁾

spent on household duties. In particular, labour scarcity within the household unit is clearly a problem for FHHs. They are larger overall but with fewer adults and more children. This results in a combination of less potential labour and additional household duties, which in turn leads to a reduction of income generating opportunities. Consequently, they would benefit from labour-saving technologies, including energy.

The government has explicitly accepted the need to pay special attention to women in development since 1981, when a Women's Affairs Unit was established. The national gender programme⁽¹⁶⁾ identifies poverty and economic empowerment, among others, as being crucial areas where gender issues need to be integrated into mainstream policy making. In some instances – for example, through support for NGOs that aim to make products that are traditionally produced by women commercially viable – significant progress has been made, and a number of women have reached senior positions in the government.* But elsewhere, other than political rhetoric, the matter has yet to be seriously addressed.

This is in the context of a society, which remains to a large

[†] Minister of Mineral Resources Energy and Water Affairs, quoted in *Mmegi Monitor* newspaper, 17 September, 2002.

* Informal discussions with senior BPC staff indicate that there is serious concern about the implications of requiring the corporation to in effect administer a large number of highly subsidised long-term loans.

* At the time of writing, six out of twenty cabinet ministers are women, as is the governor of the central bank and several permanent secretaries. This suggests some potential for leverage at the highest level to get women's issues a prominent place on the national agenda.

extent patriarchal, especially in the rural areas where the view of women as producers – and reproducers – for the household is still widely held. Female vulnerability is extended, even within the household, to practices of sexual abuse and defilement (Women and Law in Southern Africa⁽¹⁷⁾). Similarly, the contribution of females to asset acquisition by households may go unrecognised, as evidenced by the frequency of the practice of 'land-grabbing' of assets from widows.

Household Energy Decisions in Rural Areas

Sen⁽¹⁸⁾ emphasises the potential benefits of enhancing the agency capabilities of women, not just to improve their own well-being but also as a means to wider social advancement. There is plenty of evidence showing that, if constraints on their economic participation are lifted, women seize the resulting opportunities with much success; he suggests that 'nothing' is so important for political economy as adequate recognition of this.

In this context, it was decided to investigate the extent to which the gender of the decision maker has been a significant factor in determining whether households opted to move to the use of modern energy, income permitting. If this proved to be so, there may be a case for gender-specific policy interventions to support movement to modern energy.

A model of household behaviour

The specific question examined was whether use of modern energy is higher in households where women are key decision makers. From the economist's perspective, this can usefully be looked at in terms of a model of household production and consumption, where the household decision maker maximises consumption, subject to a budget constraint that is a combination of labour income and the availability of free labour within the household, and where consumption requires an input of energy. In this model, the key considerations include:

- i. the extent to which welfare is maximised on behalf of the decision maker alone or the household more generally;
- ii. the opportunity cost of household labour;
- iii. the energy technology required to support consumption.

If the hypothesis is true, then the gender of the decision maker will be a principal determinant of i. But even if such gender-related behavioural differences do exist, this may not be reflected in the observed energy choices. Male decision makers may systematically demonstrate more selfish behaviour in terms of i. but not show any observable bias towards exploiting household labour either if

the opportunity cost for such exploitation is high (e.g. if wage earning alternatives for the same labour were likely to be more rewarding), or non-modern energy household production technologies cannot meet their consumption requirements. The latter would be the case, for example, where consumption was biased towards entertainment of the decision maker which could only be supplied provided through modern energy (TV, Hi-Fi etc). Such factors are considered to be potentially important in such a fast developing economy as Botswana, even in the rural areas.

Similarly, the model suggests that observations seemingly in accordance with the hypothesis may not in fact provide robust support. For instance, if female decision makers occur predominantly in situations where the costs of household labour are naturally internalised in the decision-making process (such as when the decision maker is also the main potential source of labour supply), then the observation that less exploitation of such labour occurs is not necessarily an indication of less selfish behaviour. Again this is relevant to the case of Botswana, where in many instances female decision makers are in households with fewer adults.

Data

The main source of information was the database for a survey undertaken for the Energy Affairs Division (EAD) of the Botswana Government in 1999 to determine the future demand for electricity in rural areas. This covered 445 households from ten rural villages from across Botswana. Specifically, the following categories of question were analysed:

- Household composition: size; gender and marital status of household head
- Monthly income
- Sources of energy for cooking, heating and lighting
- Decision making and means of energy acquisition

The survey was not designed with the hypothesis considered here in mind and while these components were considered a useful starting point, several qualifications are noted. First, the questions were not ideal in every instance. For example, the information on household composition was limited to the gender of the household head and number of household members, which clearly provides only limited information on the availability of household labour and other factors (such as dependency) that might affect energy decisions. As pointed out by Mookodi⁽¹⁹⁾ the implicit assumption that the household head is the decision maker is simplistic. It is further recognised that the sample size is quite small, especially when broken down into sub-categories, which further limits the validity of any conclusions.

Set against these difficulties, is a major advantage in using this data set. It was compiled for a report commissioned by the government as a basis for discussing medium term energy policy issues. This allows other studies that use it to make an input to policy discussions in the context of a

consistent framework.

Data Analysis

The principal indicator used was the *profile of energy use* based on main energy sources for each use category (cooking, heating and lighting) categorised according to the *gender of the household head/decision maker*. This was controlled for household income and size. Subsidiary indicators included the impact of *delegation of energy decision making* by the household head and the *means of acquisition of traditional energy* (i.e. whether it is collected through household labour or purchased).

Table 5 summarises the household characteristics of the sample. MHHs, which comprise 45.6%, are on average slightly larger than FHHs. The difference of about one person per household is partly explained by the much higher proportion of single household heads among FHHs (87.8% compared to 19.7% if divorced/widowed are also included).^{*} This pattern may be expected (if present, an adult male will tend to be the household head) but it has implications for interpreting the data since the concentration of single heads among FHHs suggests internalisation of household labour costs may be more prevalent. This said, however, there is no detailed breakdown (numbers of adults and children, etc), which would be required for a more detailed analysis of the household labour force.

For both categories, the variation in size is very large ranging from 1-29 and 1-30 for MHHs and FHHs respectively[†]. While there is no breakdown on the numbers of adults and children, it is clear that there is a wide range of labour resources within both male- and female-headed households.

Table 5: Household composition and average incomes

	MHH (45.6%)	FHH (54.4%)
Average size (no of people)	8.5	7.5
Married	80.3%	12.2%
Single	15.7%	60.2%
Divorced/Widowed	4%	27.5%
In villages with grid electricity	70.2%	73.6%
Average Monthly Income (Pula) [‡]	541.9	310.4

1. Average incomes are calculated using the numbers of households to which an answer was given to this question

Access to electricity, measured as the proportion of households living in an area where grid electricity supply is provided, is slightly higher for FHHs in the sample (73.6% compared to 70.2%). This will slightly increase the probability, other things being equal, of FHHs actually having grid connections, but not significantly so.

Table 5 also shows the average monthly income of the two major household groupings. At P538, the average income of MHHs is 75% higher than that of FHHs. This is not surprising and immediately confirms that comparisons between households concerning energy use will need to allow for income disparities. In relation to income levels, it should also be noted that there are indications that this part of the survey may be unreliable. Among FHHs, 18.7% of questionnaires did not include any figure for monthly income (either blank or simply stated an occupation).^{*} Also, the figures were based on cash incomes only, thus ignoring income in kind. Such non-cash income is important in the rural areas both in raising average income levels and substantially reducing rural income inequality (Hudson and Wright⁽²⁰⁾). Therefore, there may be some presumption that incomes of FHHs are understated compared to MHHs.

Table 6 shows the principal sources of energy for the three main categories of cooking, heating and lighting, again comparing MHHs and FHHs. It also shows households that indicated that they had use of electricity (either through grid connection or other means). For each sub-group, the average monthly cash income is shown in brackets.

In nearly all cases, the breakdown of energy use is very similar between the two household groups. Given what has been observed about average income level, this may seem to give some strong support for the hypothesis since FHHs, despite having much lower average cash incomes, have almost the same observed breakdown both between modern and traditional energy, and among categories of modern energy. The average incomes of the various sub-groups also seem to support this conclusion. Note in particular that the average incomes MHHs using firewood as the main source is much higher than for FHHs (as a simple average across the three categories the MHH incomes are 89% higher), which is consistent with the view that male decision makers may make greater use of household labour.

However, the evidence is more mixed, for four reasons. *First*, as already suggested, the smaller household sizes in FHHs may contribute to the observed differences. *Second*, the point made earlier that the gap between incomes of male- and female-headed households may be narrower than indicated in the survey data. *Third*, there is no obvious increase in modern energy as average incomes rise. According to the hypothesis this pattern might be expected among MHHs, given the suggested propensity to exploit household labour in order to save cash income for consumption. But for FHHs, where labour saving is supposed

* While data on this is not included, it may also be presumed that many of the married female heads are also effectively single since they are deemed the household head by virtue of their husbands' absence.

† In both instances, the average is increased by the existence of a few very large households.

* In most instances it seems that this was due to the interviewee not being the household head and/or income earner. As well as reducing the sample size significantly, it raises the question of accuracy for cases where figures for income were given.

to be a greater priority, there should be a clear move to adopt modern energy to the extent that financial resources permit. Yet, at least according to this data set, if anything the opposite is the case. For FHHs, except in the case of heating (where the high average income is the product of only two households with highly divergent incomes), average incomes for 'other modern energy' relative to fuelwood are lower (92%). The equivalent figure for MHHs is 104%.

Finally, the numbers themselves raise concerns about the quality of the data. The implication that households with lower average incomes are more inclined to use electricity than fuelwood appears deeply implausible. There are also some clear anomalies in the data regarding electricity connections.

Table 7 shows the allocation of decision-making regarding acquiring traditional energy within households, and the means of acquisition. Two points stand out. First, as with main energy sources, there is again little difference between the two household groups regarding the decision to purchase or collect fuelwood. Subject to the same qualifications regarding income and household size that have already been noted, this would seem to support the hypothesis.

Table 6: Major sources of energy (%) and average income (P/month)

MHH	Cook		Light		Heat	
Wood	42.4	(602)	48.5	(575)	4.5	(561)
Oth Trad	0.0		0.0		0.0	
Elec	0.0		1.5	(353)*	10.6	(771)
Oth Mod	9.1	(661)	3.0	(629)*	82.3	(524)
Mix	47.5	(458)	0.0		0.5	(300)*
Non-resp	1.0		47.0		2.0	
Electric connection	15.2	(704)				
FHH	Cook		Light		Heat	
Wood	36.2	(304)	42.7	(301)	1.2	(317)
Oth Trad	1.2	(410)	0.0		0.0	
Elec	0.0		1.2	(125)*	12.6	(250)
Oth Mod	8.9	(262)	0.8	(925)*	85.4	(313)
Mix	53.3	(324)	0.0		0.0	
Non-resp	0.4		55.3		0.8	
Electric connection	7.7	(934)				

*Average incomes which are seen as particularly unreliable due to small sample size

The second point is concerned with delegated decision making. The substantial group of female energy decision makers in MHHs is potentially important. They comprise a large proportion of the total (43%) and it might be expected would help effectively control for differences in household size and income. However, only 27% of those MHHs that both reported purchase as the preferred means of acquiring fuelwood and where the decision maker was identified were instances where decision making had been delegated to a woman; that is, much less than the overall size of the group. (Unfortunately a meaningful income calculation was not possible for this sub-group.) This result is not consistent with the hypothesis, but must be interpreted cautiously. The substantial degree of reported delegation may be a reflection of the traditional woman's role of a producer within the household and the extent of delegation in practice (availability of cash for purchases, etc) may be limited.

Table 7: Traditional energy – decision making and acquisition (%)

Decision Maker			Purchase or Collect		
	MHH	FHH		MHH	FHH
Male	48.8	2.4	Purchase	14.9	13.4
Female	42.9	97.6	Collect	55.9	53.6
Joint	8.3	0.0	Mix	9.3	33.1

There is some tentative indication from the data that *married couples* may be more inclined to use electricity. The connection rate is the same percentage as MHH overall, but with lower average incomes. In the report prepared for EAD by Zhou⁽¹⁶⁾ based on this survey, the greater interest by married couples in electricity connections was also noted, with a suggestion that this may reflect greater commitment to home building among married couples, which may in turn arise due to greater security regarding household arrangements, including future income prospects. This appears a reasonable supposition, but it is clearly not consistent with the hypothesis. That would suggest the opposite effect: i.e., that marriage enhances further the male role as household head, leading to increased expectations of a secure supply of household labour (as marriage reduces the likelihood of the woman departing) with the result thus increasing reliance on traditional energy.

It is also worth noting that 14.7% out of widowed and divorced female household heads have electricity connections. This is very similar to the rate for MHHs, which is the relevant comparison in this case, suggesting that there is no significant shift to modern energy sources once male dominance in the household is removed. This conclusion is reinforced by the average income level for this group of P864/month. There is also a higher proportion (22%) who purchase rather than collect firewood; but this might be

explained by a higher average age among widowed women, who dominate the sub-sample.

Findings

The evidence that has been reviewed provides some cautious support for the idea that female decision makers are more inclined to choose modern energy. In particular, it seems that there is a significantly greater tendency among FHHs to utilise modern energy once their much lower income levels are taken into account. This is to such an extent that it is unlikely to be explained fully either by unrecorded sources of non-cash income or smaller average household sizes that could promote labour-saving household production among the sample group.

The support for the hypothesis is not unconditional however. Five important qualifications are noted here:

First: The sample size is quite small compared to the total rural population and, especially for some of the breakdowns, may not be sufficiently representative.

Second: The questions in the survey were not designed with this particular hypothesis in mind. Because of this some, potentially useful information is missing from the data set. In particular, it is insufficient to simply report on household size in terms of the numbers of people, when the issue of household labour supply is of such central importance. The assumption implicitly used here that larger households inevitably increase the supply of household labour is not necessarily correct in every instance. Similarly, the questions regarding decision making, while potentially important, were insufficiently precise regarding the extent of delegation; while the absence of any information on non-cash sources of income is a potentially serious omission.

Third: Inaccuracies and inconsistencies appear to be prevalent in the data set. The clearest example is in the inconsistency between households that indicate that they have electricity supply and those that name electricity as a major source of household energy.

Fourth: Even when the result of the data are taken at face value, there are some that may be at clear variance with the hypothesis. To some extent, this confirms the earlier points regarding the inadequacy of some of the questions and possible inaccuracies in the data. But it is noteworthy that FHHs with higher reported cash incomes do not show an increased demand for modern energy. If further investigation were to support this observation then some refinement of the hypothesis and/or underlying model of household behaviour would be necessary. There is also no evidence to support the contention that widowed or divorced women show a higher demand for modern energy above that which is explained by their generally higher than average income levels. This finding clearly goes against the hypothesis.

Fifth: Finally, but in some ways most importantly, the data set represents a snapshot of the situation prevailing at the time of the survey, the details of which are unlikely to remain constant. Indeed, they may be changing rapidly as Botswana continues to be transformed rapidly, both socially and economically. This has been confirmed through the preliminary results of the 2001 *Population and Housing Census*⁽²²⁾, which indicates that a majority of the population is now classified as living in urban areas. The next *Household Income and Expenditure Survey*, for which fieldwork was being undertaken at the time of writing, is expected to confirm substantial further reductions in poverty. Overall, the rural/traditional nature of Botswana society is being eroded, while rising real incomes and expanding national infrastructure open up new consumption possibilities even among poorer households. The implications of such a dynamic process, even if they cannot be clearly quantified must be factored into any conclusions from this study.

Concluding Comments

While some may argue that the gender focus on energy decision making is somewhat peripheral, there is a clear need to provide additional well-based research if substance is to be given to the Botswana Government's commitment to enhance the economic opportunities of women. In this context, this paper has examined the impact of gender in energy decision-making in rural households in Botswana. An existing database was utilized for this purpose and some support was found for the suggestion that, once other factors – notably income – have been taken into account, female decision makers may be more likely to embrace modern energy. If so, this would have potentially important implications in the context of the Botswana Government's current drive to expand the use of electricity outside urban areas.

However, this support was heavily qualified, which suggests that further research may be necessary. It is also necessary to extend the scope of the research to cover energy decisions regarding business operations. This was initiated as part of the broader project from which this paper is drawn, including the review of relevant case studies (e.g., Porter⁽²³⁾ and BIDPA⁽²⁴⁾) and initial fieldwork in two rural locations (Ditlhale⁽²⁵⁾), and this needs to be pursued further.

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