

# Vossmann Energy Baseline Survey

Project Report

in the



Vosman Basa Njengo Magogo alternative  
fire lighting method implementation project

Implemented by



Palmer Development Consulting

9 June 2006

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### **1. Introduction**

Anglo Coal appointed PDC to implement a Basa njengo Magogo alternative fire lighting method demonstration project in Wards 7, 8 and 9 of Vosman Township near Witbank. The project aimed to demonstrate the Basa njengo Magogo (BnM) method to 10 000 households in the identified project area within the winter months of June, July and August 2006. As part of the broader project, a concise energy baseline study was carried out to determine the socio-economic background of households, energy consumption and expenditure and specifically coal use patterns. The following report will provide the results of the baseline study carried out during the last week of May 2006.

### **2. Background**

The project area was pre-selected in conjunction with Anglo Coal, the local municipality of Emalahleni and area Councillors, and the energy baseline study was therefore not conducted to aid in area selection but to provide some background information on households and their energy use and expenditure patterns. Secondly, the energy baseline study was also used as a training exercise to familiarise the 26 selected area fieldworkers with questionnaire based data collection methods which would be required during the course of the project. All fieldworkers completed energy baseline questionnaires and what is interesting to note is that the majority of households interviewed were also given a BnM demonstration by the fieldworkers. This was not requested of them but they reported that households were interested in the method, especially after the area launch on 20 May 2006. Fieldworkers were requested to conduct a minimum of 5 household interviews but some completed more. Project team members

In terms of the three selected Wards, the estimated number of households per Ward is as follows:

- Ward 7 approximately 4000 households
- Ward 8 approximately 4000 household
- Ward 9 approximately 2000 households

Ward 7 is the larger and more informal area, mostly unelectrified and often poorer than the other two Wards. In Ward 7, houses are built from a variety of material such as mud, zinc, cement blocks and discard material and houses are less formal in structure than the other Wards.

**Figure 1: Ward 7, woman with material she intends to use to build a house**



It was reported that a high number of Mozambicans live in Ward 7 and in people in general were less friendly and demanded electricity instead of being shown an alternative method for lighting coal. What was interesting to note was that in general, Ward 7 was much cleaner than Ward 8 and specifically Ward 9 which seems to have a very serious rubbish problem.

**Figure 2: Informal house, Ward 7**



**Figure 3: Children crossing the road to dump household refuse, Ward 9**



Ward 9 is the oldest and most formal of the three Wards, although zinc and mud houses are also common.

**Figure 4: Ward 9**



Although people have been living in the area for more than 15 years, basic services such as water born sewage, electrification and improved roads were only put in place in the past 5 years.

**Figure 5: Street in Ward 8**



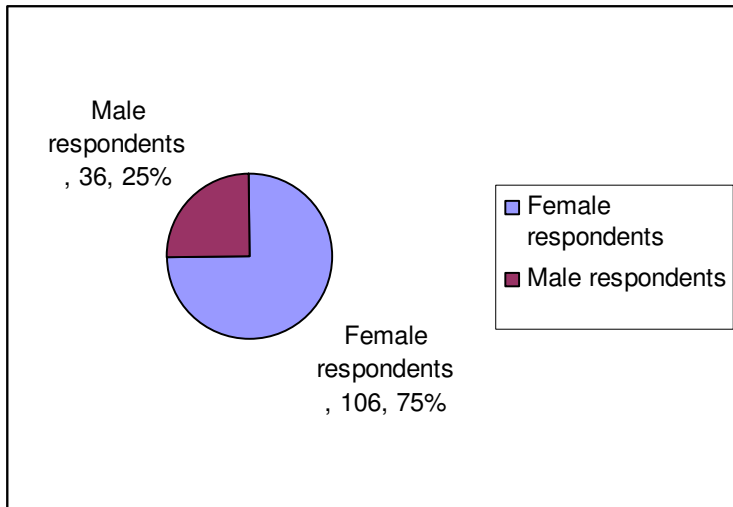
### **3. Methodology**

Data collection was effected through a questionnaire-based (attached as Appendix 1) interview conducted with the household member responsible for procuring household energy and specifically coal. Households were randomly selected from the 3 Wards in the project area. Data was captured and analysed in Access.

### **4. Data analysis**

#### **4.1 Gender composition of sample**

Of the total 142 interviews conducted, 76 were conducted with female respondents while 36 were conducted with male respondents, as illustrated in below:



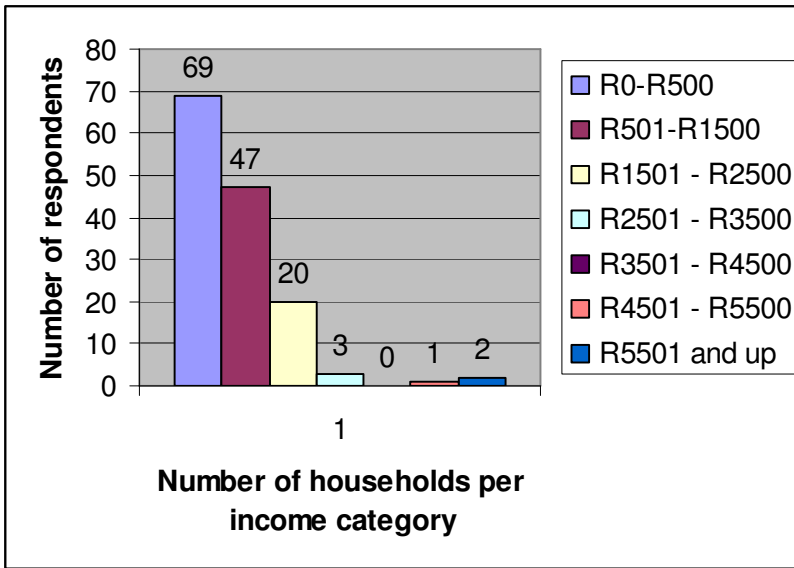
Women are traditionally the procurers and managers of household energy and it is therefore, important to interview women around household energy issues.

#### 4.2 Household size

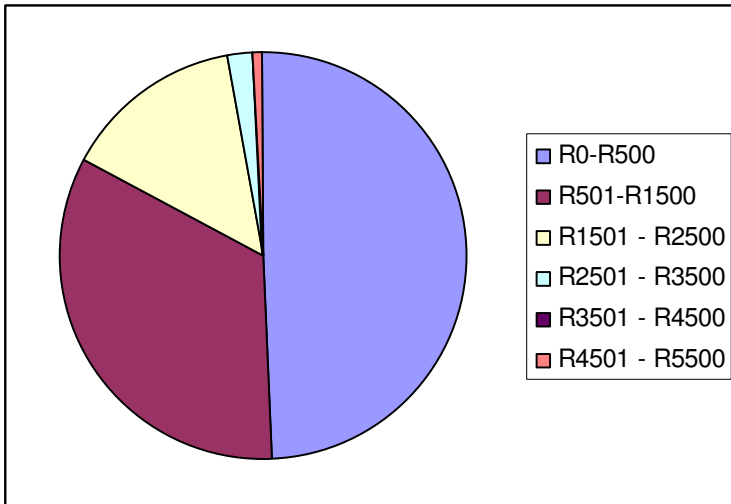
The average household size was 5 people with the highest number of people per household reported being 13, and the lowest 1. This is still higher than the 2001 reported national household size of 3.8 for South Africa (<http://www.info.gov.za/aboutsa>).

#### 4.3 Household income

In total, 69 households reported earning below R500 per month, while 47 reported earning less than R1500 per month and 20 earning less than R2500 per month. Two households reported earnings of more than R5501 per month. This is illustrated below:

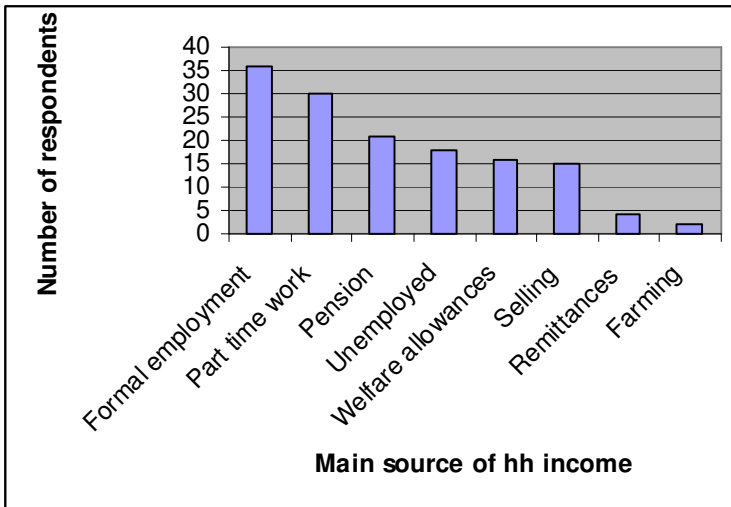


Almost 50% of the sample reported household earnings of less than R500 per month, as is illustrated in figure below: In total, 81% of the sample earn below R1500 per month.

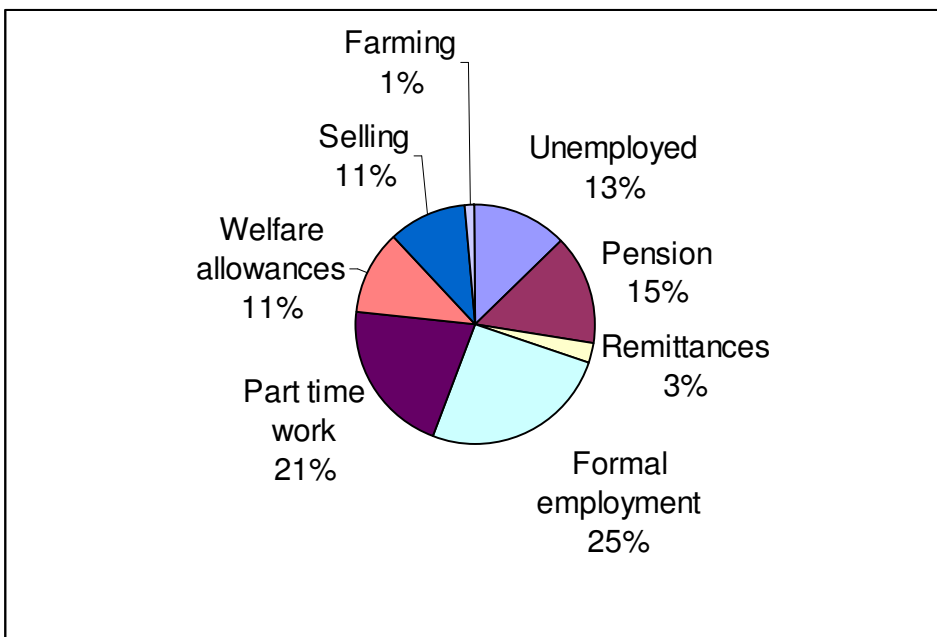


Although it is not intended to become embroiled in a discussion on poverty levels and acceptable household income levels, it can be observed that the 69 households in the poorest segment would have an average monthly income of R100 per person if the average household size is taken into account.

Main sources of household income as reported by respondents are illustrated in below:



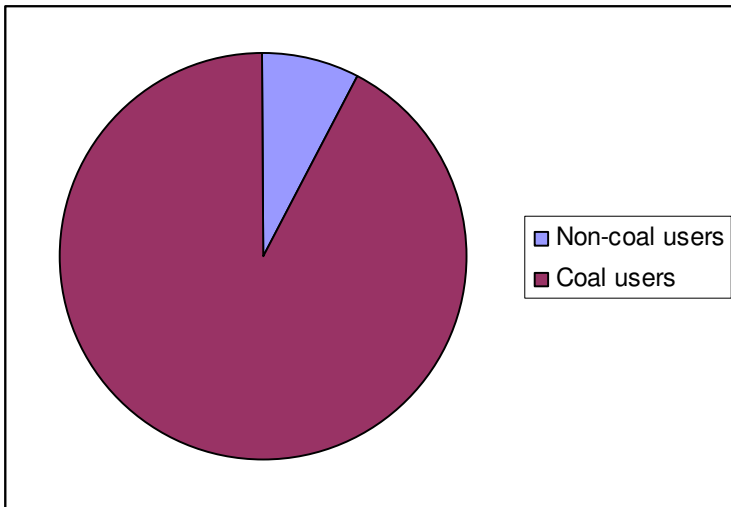
From the above it can be seen that the main source of income for households is formal employment, followed by part-time work, pension and then welfare allowances. Interestingly, one household in the sample sells coal. Only 13% of the sample reported being unemployed, as illustrated



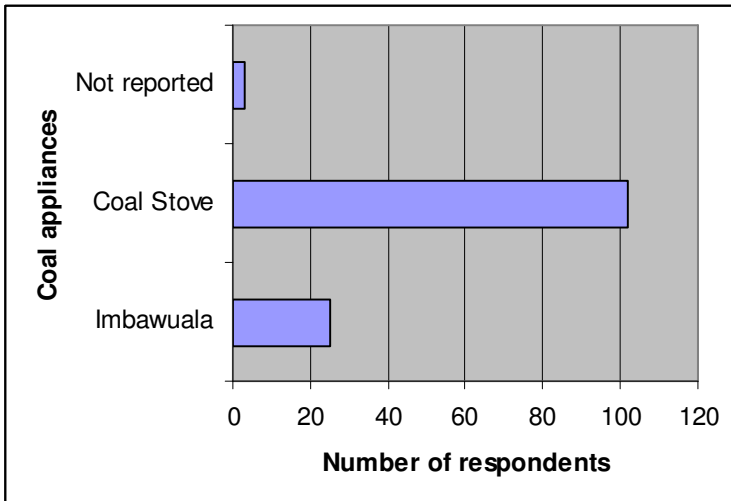
What is interesting from the sample is the seemingly low level of reliance on welfare grants.

#### 4.4 Household coal use

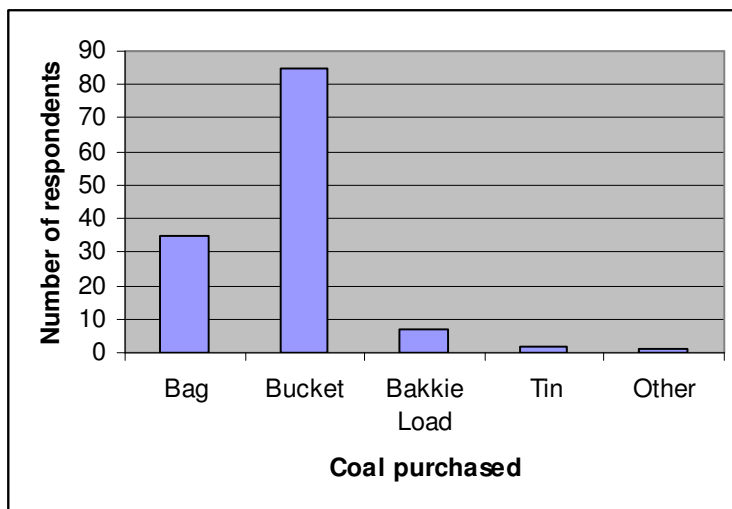
By far the majority of the sample reported using coal as a household fuel and only 11 (8%) households reported not using coal at all.



The majority of households reported using coal stove, as can be seen from



The majority of respondents (85 or 65%) reported buying coal per bucket, followed by bags and bakkies. Bags reportedly cost between R7.50 and R10.00 with most households reporting paying R7.50 per bag. Tins were also purchased at R7.50 while bakkie loads varied from as low as R190.00 to R1000.00 – the price would depend on the size of the bakkie and where the coal is bought. Prices per bag varied between R28.00 and R35.00 per bag, with most people reporting paying R30.00 per bag



#### 4.5 Willingness to learn the new method

In total, 8 respondents indicated that they were not willing to learn a new method of coal fire lighting, therefore 94% of the sample indicated their willingness to learn a new method. Importantly, the only reason why 7 of the 8 respondents were not willing to learn a new method is because they don't use coal at all. There were 2 electricity users, 1 gas user and 4 paraffin users in the group. One of the households reported caring for a 2 year old HIV positive boy and could not use coal because of the smoke affecting the child. Therefore, there was actually only 1 household which were unwilling to learn a new method.

#### 5. Coal supply in the project area

Households in Vosman obtain coal by purchasing from coal merchants as well as by collecting coal from a nearby old coal dump. Households don't admit freely to collecting coal from the dump as it is prohibited and they can be prosecuted. Collecting from the dump is also dangerous and households report hearing explosions (most possibly from methane gas) and the coal caving in. The quality of the collected coal is also very low since it is full of stones, very big in size, brittle and reportedly it does not burn well and it is difficult to light. Lastly, out of the 8 coal yards selling coal that were interviewed, 1 admitted selling coal from the dumping site. However, the project team suspects that more merchants are selling coal from the dump or mixing it with coal bought elsewhere.

**Figure 6: The coal dump where households collect coal**



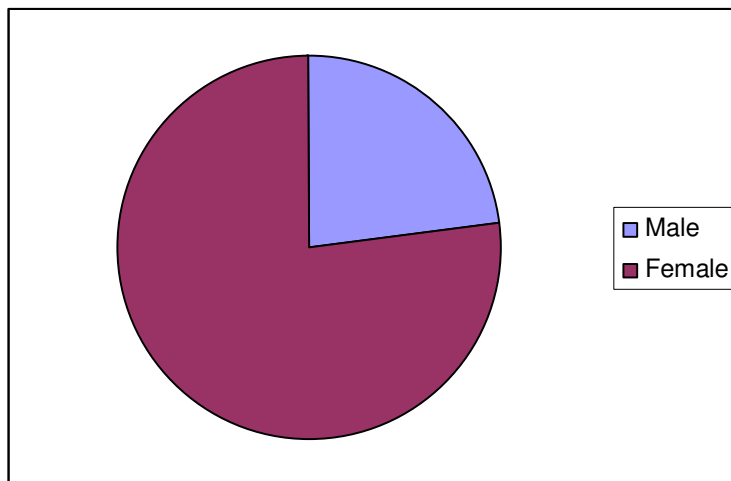
In total, 13 coal merchants or sellers were interviewed, xx in Ward 7, xx in Ward 8 and xx in Ward 9. Interestingly, 8 of the 13 merchants are female and reported owning the coal selling business. What is notable is that unlike coal yards in other townships such as Orange Farm, Tembisa and Alexandra, the coal yards of Vosman are micro-enterprises, often operated from the owners' homes and selling only coal as opposed to other products such as wood, LPG, paraffin or spaza shop-type food products. From the available data it is not possible to speculate on the relationship between the size of the operations and the gender of their owners, but this may be an extremely interesting issue to explore.

**Figure 7: A female coal merchant and owner of coal selling business in Ward 7.**



Out of the 13 interviews, 11 were conducted with women (9 owners and 2 assistants). The gender breakdown of the respondents is illustrated in, below:

**Figure 8: Gender breakdown of respondents**



Of the 13 respondents, 11 reportedly owned the business. The other 2 interviews were conducted with shop assistants.

Out of the 13 sellers, 4 reported also selling other energy carriers – 3 sold coal and wood, while 1 sold coal and paraffin. Data suggest that some coal sellers sell on average 5 tonnes of coal per month during summer and 10 tonnes of coal per month during the winter period. From responses, it can be seen that sales figures double

between winter and summer. The average tonnage sales figures should be treated as indicative only, since not all sellers could answer exactly how much they sell per month – another indication of their unstructured approach to selling coal.

In terms of monthly income from selling coal, merchants reportedly sold on average, R1670 worth of coal per month during summer and R2450 worth of coal per month during winter. It is not possible to estimate sellers' profit, although .....

11 out of 13 coal yards reported selling coal in 20 litre tins, one seller sold in 25 kilogram bags and one seller sold in 20 litre tins and bags. No deliveries take place and customers collect from the sellers.

Coal sellers obtained their coal from a variety of suppliers: Delmas coal yard (1), Graspan colliery in Middleburg (8), the dump site (1) and Loufontein Ogies (2). The majority therefore are supplied from Graspan in Middleburg. All merchants, except the one buying from Delmas coal yard collect their coal from the supplier – Delmas coal yard delivers to the merchant. This would imply that most merchants either own a suitable vehicle to collect the coal or have access to such a vehicle.

Merchants reported a variety of problems that experience as a coal merchant. Extending credit to households who then do not repay the merchant was the most often cited problem and 6 of the 13 merchants mentioned it:

“They want credit but they don't pay” and “Customers want credit then they don't pay back and they make my profit shot” also “People don't have money to buy coal and wood. They say give me one bag of coal and end of the month I will pay you. End of the month they don't pay.”

The second most mentioned problem relates to the quality of the coal (mentioned by 3 sellers, all buying their coal from Graspan, Middleburg): “The quality of the coal changes and my customers complain. Sometimes it is good and sometimes it is bad”. The same respondent mentions that sometimes the coal is like “black sand” which she can't sell and she can not return it to the mine. The second respondent said “sometimes the coal does not burn, and then people don't buy from me”. Other problems mentioned were that people don't buy a lot of coal in summer and that coal gets damaged when kept in the coal yard for too long. Also, one respondent reported not understanding how the price of the coal is calculated; making it difficult to know exactly how much she pays for the coal.

The coal sellers of Vosman present an excellent opportunity to Anglo Coal in the form of further community involvement and future projects. A clear need exists amongst the coal sellers to obtain some basic business training and management skills and it is recommended that Anglo Coal supports a programme to train and capacitate the coal merchants in Vosman.

## 6. Conclusions and recommendations

Based on the findings from the baseline study, it was concluded that coal use in Vosman warrants the Basa njengo Magogo intervention, that households are willing to learn an alternative fire lighting method and that monetary savings will benefit low-income households in the project area.