

Identifying Factors that Contribute to Poor Performance of Junior Coal Miners in South Africa

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Abstract

The junior coal companies in South Africa are facing a number of challenges which have contributed to poor performance, resulting in some of them having to close down. The SA government developed a mining charter which encourages 26% black ownership (Broad Based Black-Economic Empowerment) in mining companies, which aims to support junior miners. In addition, Eskom has also developed a policy that enforces that 40% supply of thermal coal must come from junior miners. As a result, Richards Bay Coal terminal in conjunction with Transnet increased its capacity to boost junior coal miners. Despite this support that junior coal miners are getting, they still face operational challenges which range from finance, transportation, production, and lack of skilled personnel. This has caused a number of junior miners to shut down their operations as the taxes, royalty fees and community investments continue to be a burden. Data was collected using questionnaires as well as personal interviews. The study revealed that the most common challenge for the junior miners is lack of capital and financial support. The lack of finance has led to junior miners not being able to afford relevant industry skilled personnel.

Keywords

Productivity, production, operations management.

1. Introduction

The junior coal companies in South Africa are facing a number of challenges which have resulted in some of them having to close down. According to Minerals Council South Africa (nd), a junior mining company is defined as prospecting companies who are only involved in the early stages of mining. In South Africa, a junior company is defined as a black economic empowerment certified company (BEE), and the term junior mining company includes in addition to exploration companies, mid-tier producers. According to Engineering News, junior coal companies account for 30% of the coal production in South Africa. The five largest mining groups in South Africa are Anglo Coal, BHP Billiton, Exxaro, Sasol, and Xstrata, they supply almost 74 percent of the saleable coal in South Africa (CM 2008). There are forty-two companies that operate coal mines in South Africa (DME 2009). Out of the forty-two companies, only six companies contribute 90% of the country's saleable coal production. These companies include Anglo Coal, BHP Billiton, Kumba Resources, SASOL Mining, Exxaro Coal and Xstrata Coal.

The South African government developed a mining charter in 2016 which encourages 26% black ownership (Broad Based Black-Economic Empowerment) in mining companies, which aims to support junior miners. In addition, Eskom also developed a policy in 2016 that enforces that 40% supply of thermal coal must come from junior miners. As a result, Richards Bay Coal terminal in conjunction with Transnet increased its capacity to boost junior coal miners (Engineering News 2014). Despite this support that junior coal miners are getting, they still face operational challenges. This has caused a number of junior miners to shut down their operations as the taxes, royalty fees and community investments continue to be a burden (Engineering News 2014). One of the major causes of this crisis is the lack of re-investment by larger coal mining companies like Anglo Coal, BHP Billiton, Exxaro, Sasol, and Xstrata. These larger companies had received assistance from the government so that they can support junior coal miners (Hartnady 2011), and yet junior coal companies still face challenges. This study aims to investigate and identify the factors contributing to poor performance of junior coal mines in South Africa.

The simple random sampling method under the probability method of sampling was used and each and every unit in the population had an equal chance to be included in the sample. Hence unbiased results were produced since the sample selected by simple random sampling method was likely to be the representative of population as a whole. Data was collected using questionnaires as well as personal interviews. Personal interviews involved one on one interviews through the phone with respondents which had been arranged through prior appointments. Personal interviews were conducted in several ways, telephone, skype, video phoning, and face to face interviewing while the respondent filled in the questionnaire. These methods were employed because they are quite flexible and it aids the researcher to collect a large amount of information. The use of interviews eliminated uncertainty as to whether the questions were fully understood. This was particularly important where the answer to one question determined what the next question would be. The researcher could use facial expressions and voice tones to study participant's behaviour

Questionnaires were mailed to the respondents and electronically distributed through a link. Given (2008) described questionnaires as a list of questions which are sent to study participants who will complete them and return them. This instrument was used as a guide for collection of data from respondents for surveys and interviews. The questionnaires had both closed and open ended questions. The questionnaire was based on the research objective and the questions were direct to ascertain the factors. The content of questionnaires consisted of both factual and subjective questions.

Wording of questions for the questionnaire were guided by fundamental guidelines which included keeping questions simple, clear and concise, asking one question at a time, avoiding leading questions, avoiding ambiguous language and double negative questions. Furthermore, the questionnaire was not too long or complicated because long questionnaires tend to demotivate respondents and usually lead to very low overall response rate. In designing the questionnaire, the researcher took cognizance of the amount of time it takes to complete it.

The researcher followed three principles namely; beneficence, respect for human dignity as well as justice (De Beck et al. 2001). In this study physical harm was not to be considered, however, the researcher bore in mind that the psychological consequences needed sensitivity. The researcher was sensitive to the participants' emotions when probing questions that could psychologically harm the company's image. The researcher told the participants that if they felt that some parts of the questions were too much for them they were free to choose not to answer the questions. The participants were assured that information that they provide to the researcher or their participation will not be used against them. The researcher shared the aim and purpose of study, the type of survey and other data collection procedures with the participants.

2. Data Collection Procedure

Appointments with respondents were set-up through email, telephone and a mining consulting company. This was done to give the respondent time to prepare. The distribution and administering of the questionnaire on the sample was done by the researcher.

A pilot survey was carried out before the actual survey. Piloting provided a guide for rephrasing questions to invite a richer response. Piloting included planning and testing all instruments. Participants were notified about the study in advance, and questions were phrased in a way that holds the participants attention. Piloting was done to junior coal mining companies which were readily available and willing to participate. Actual survey was carried out on the participants according to random selection.

2.1 Data presentation and analysis procedure

The researcher read through the mass of data editing, each question was checked to identify and eliminate errors that were made by respondents. The checking was done manually. Each item was given a code number and responses were categorized in preparation for data presentation. Percentages were used to determine response rate of subjects. Frequency tables and graphs were used to indicate responses on issues of concern.

Data analysis for the questionnaire was done by using the common statistical software SPSS (Statistical Package for Social Science) for the graphs and excel which automatically analyse the data. All questions were individually analysed, taking into consideration all the available factors and supported with descriptive and inferential analysis. The data collected from the respondents was analysed and interpreted. This section presents the results obtained.

2.2 Response rate of survey

In this study, 120 questionnaires were distributed to junior coal mining companies and 85 respondents replied and 35 did not reply. According to Sim et al (2018) a 71% response rate is high enough to warrant validity of the study findings as shown in Figure 1.

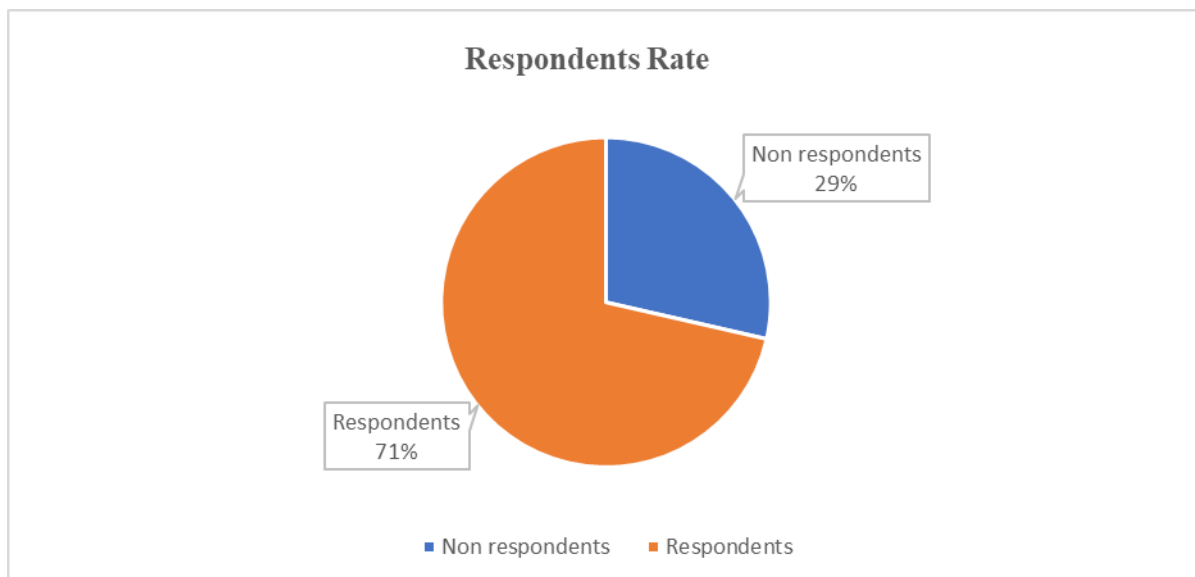


Figure 1: Response Rate

3. Results

3.1 Methods of financing the business

Based on Figure 2 results, 37% of the companies indicated that their main source of finance are the banks, 44% source their finance from private investors, 12% from personal financing, 4% from other sources like re-investment, internal financing, personal savings and bridge finance, and 3% of the junior miners source their finance from the stock exchange. The results indicate that the majority of junior miners are funded by private investors. The interviews revealed that the private investors are mostly international investors who would be looking at exporting coal to their countries, mostly India. The other source of funding that came at the top is the banks. It was discovered during the interviews that the reason behind this is because Eskom or Sasol normally gives the miners a contract to supply coal and therefore the banks use the contract as the surety.

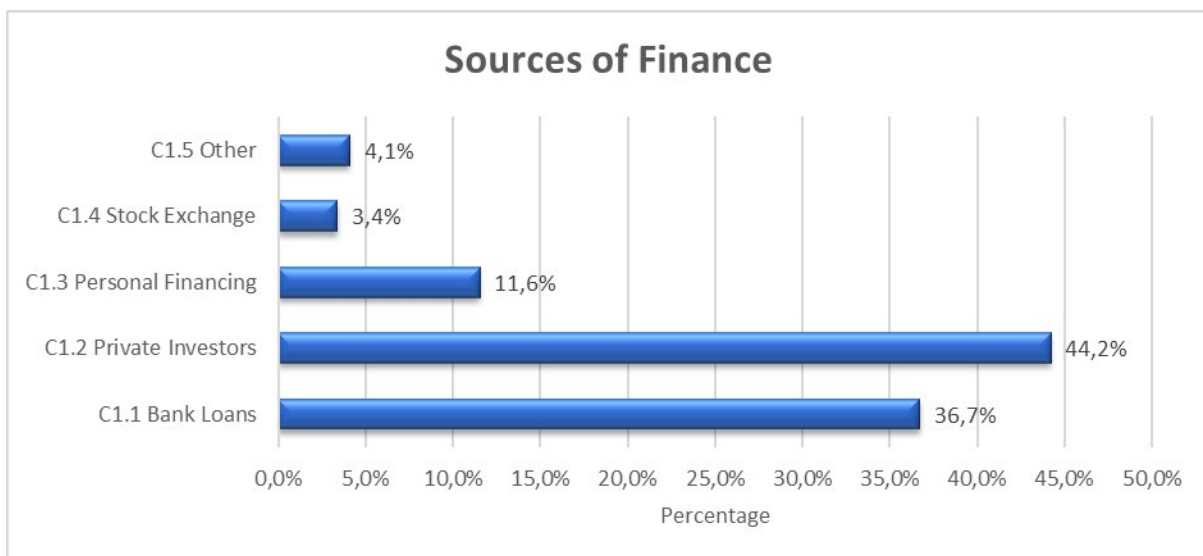


Figure 2: Sources of finance

3.2 Does the company have a contract with either Eskom, Sasol or other markets?

Figure 3 indicates that 89% of the respondents have a contract with Eskom and Sasol. These contracts seem to be of huge benefit to the junior coal miners since they have a ready market and they will be assured that they will make steady income from the proceeds of the sale of their product. 11% do not have a contract with Eskom or Sasol but 52% percent of their products they supply the domestic market. According to DME (2008), the domestic market consists of the following industries: Cement, Brick and tile, Arcelor Mittal steel, Metallurgical, Chemical industry, Iron and steel, Merchants, Agriculture and other domestic uses. About 46% goes to the export market which includes Asia, Africa, Europe and South American countries. 2% of the respondent did not specify but they indicated that it is other markets. The other companies which do not have contractual bounds with Eskom and Sasol also supply the domestic and export markets.



Figure 3: Supply to Eskom or Sasol

3.3 Mining method employed

Table 1 shows that out of the 85 participants that responded, 28% use the underground method of mining and 72% use the open cast method of mining.

Table 1: Mining methods

Mining method	Frequency	Percent	Valid Percent	Cumulative Percent
Underground mining	24	28,2	28,2	28,2
Opencast mining	61	71,8	71,8	100,0
Total	85	100,0	100,0	

3.4 How the company conduct its mining activities

The study also intended to find out how the companies mine the product and the results were as illustrated in the Figure 4 below. The results in Figure 4 show that 17% of the respondents indicated that they make use of contractors, 72% use both methods, the contractor and owner mining so that the risk and profits are spread. On the other hand, 11% of the respondents do their own mining because they have all the resources. It can be noticed from the results that 17% of the companies make use of contractors. This is due to that junior coal miners do not have capital to buy their own mining equipment. Also, there is a scarcity of mining engineers in South Africa and if they do find one, they seldom afford to pay them a market related salary. It was also revealed that, not only do miners have to contract mining equipment but they also have to outsource other expertise like geologists and environmentalists. This is costly to the miners as the contractors take a portion of up to 80% of profits from the sales.

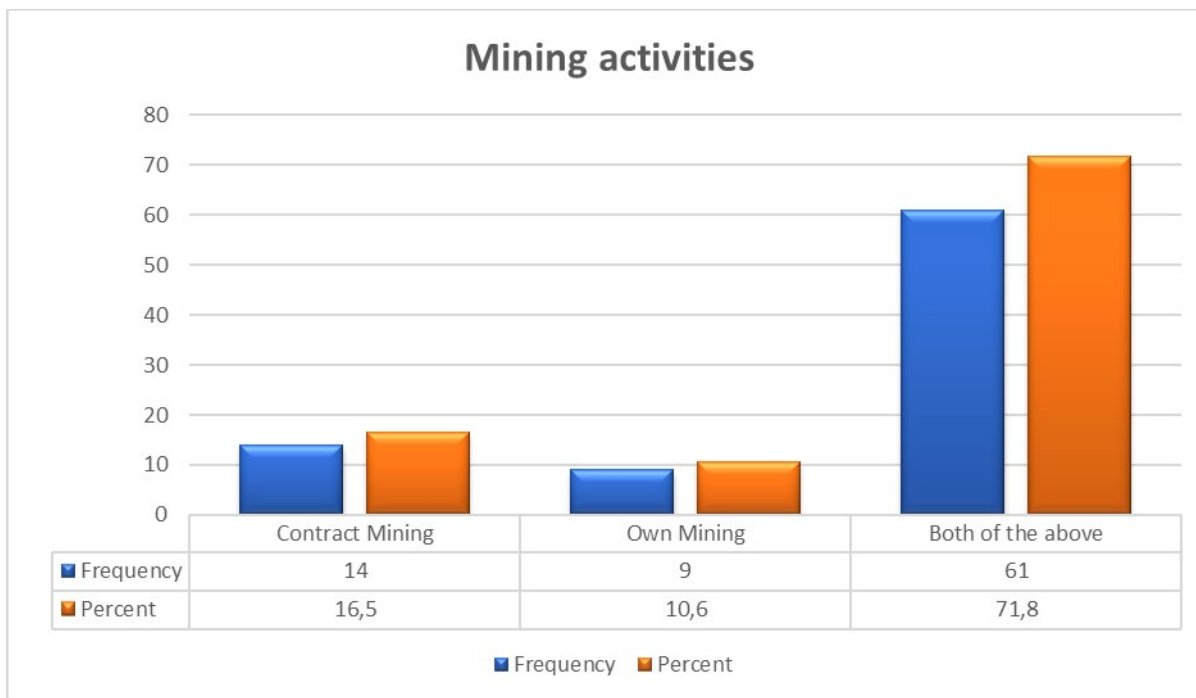


Figure 4: Mining activities

3.5 The Annual average production tones (mt)

Figure 5 shows that 12% of the miners produce less than 0.5mt, 31% produce between 0.6 to 5mt per year, 31% produce between 5.1 to 10mt, 17% produce between 10.1 to 15mt, and 11% produce more than 15.1mt.

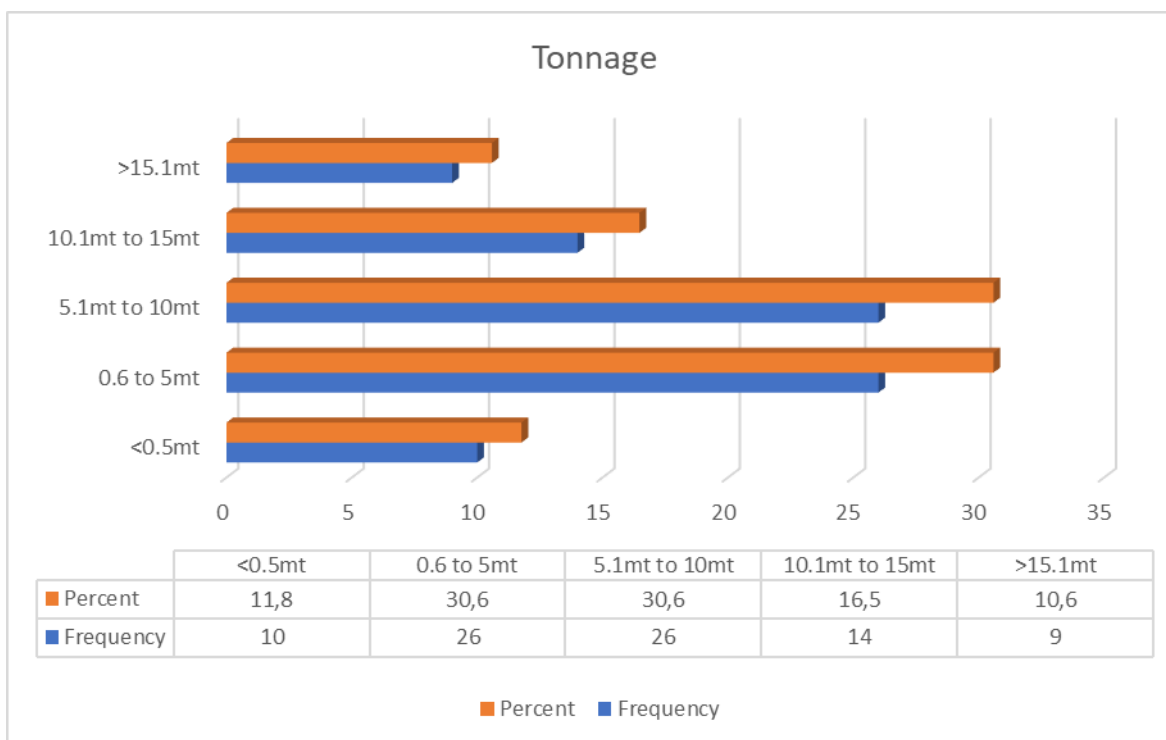


Figure 5: Tonnage per annum

3.6 Mode of Transport used for Ferrying Product to the Market

Figure 6 presents the results of transport mode used by the junior coal miners to transport their product to customers. The figure shows that 14% of the junior coal miners use road to transport their product, 4% use rail transport and 82% use of both road and rail. Companies who use road transport usually supply the local market and some of the Eskom power stations. The miners use rail transport to transport their product to ports where they will be shipped and exported to international customers.

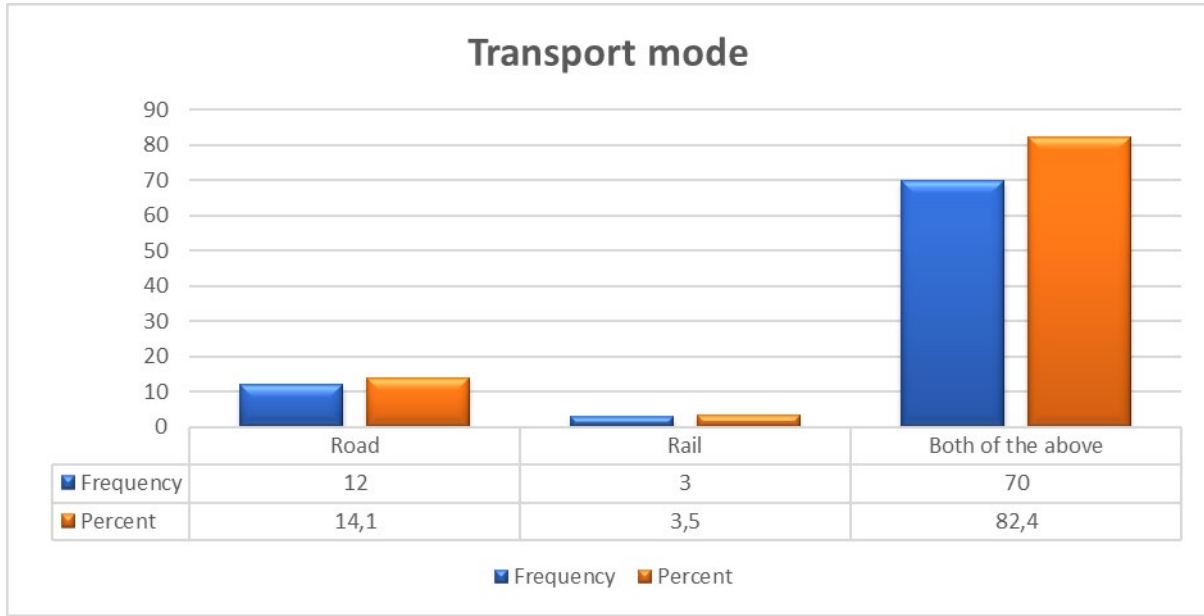


Figure 6: Mode of Transport used

3.7 The most challenging operation in coal production

The most difficult operation in mining is the plant maintenance as shown in Figure 7, constituting 46% of the respondents' answers, followed by logistics and coal beneficiation both at 27% respondents

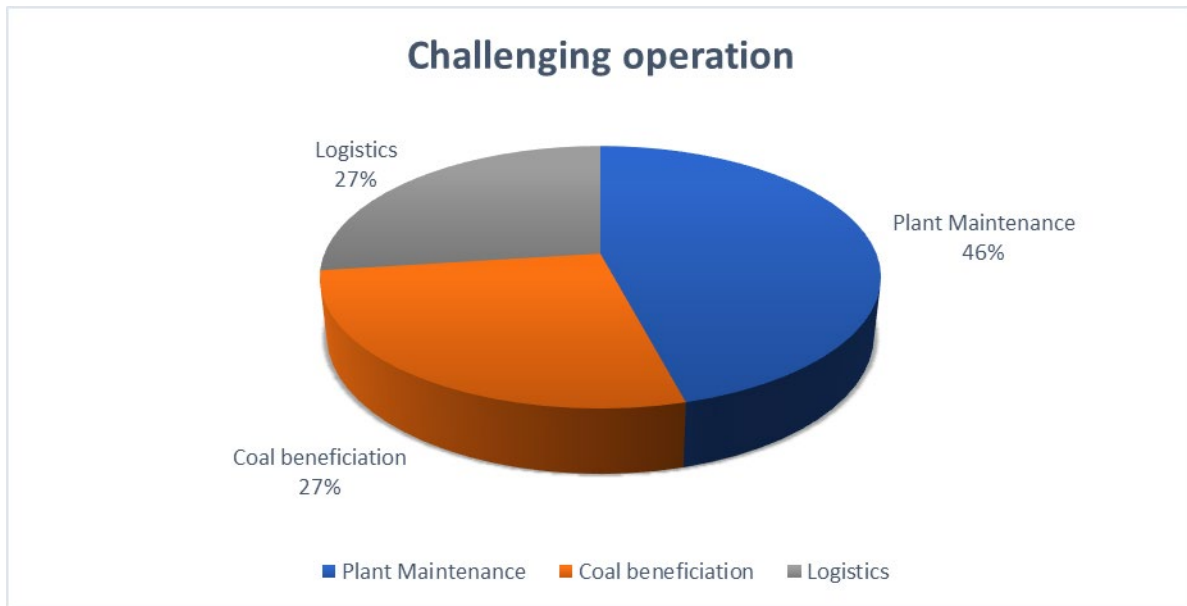


Figure 7: Challenging operation in coal production

3.8 Number of years the company has been in operation

Respondents were asked to state the number of years their company has been operational. Figure 8 shows that 15% of the companies have been in operation for less than five years, 32% between 6-10 years, 38% 11-15 years and 15% above 15 years. From these results, it shows that the majority of the companies have been operational for 11-15 years. This indicates that even though these companies have been in operation for more than 10 years, there are still struggling whether financially or operationally.

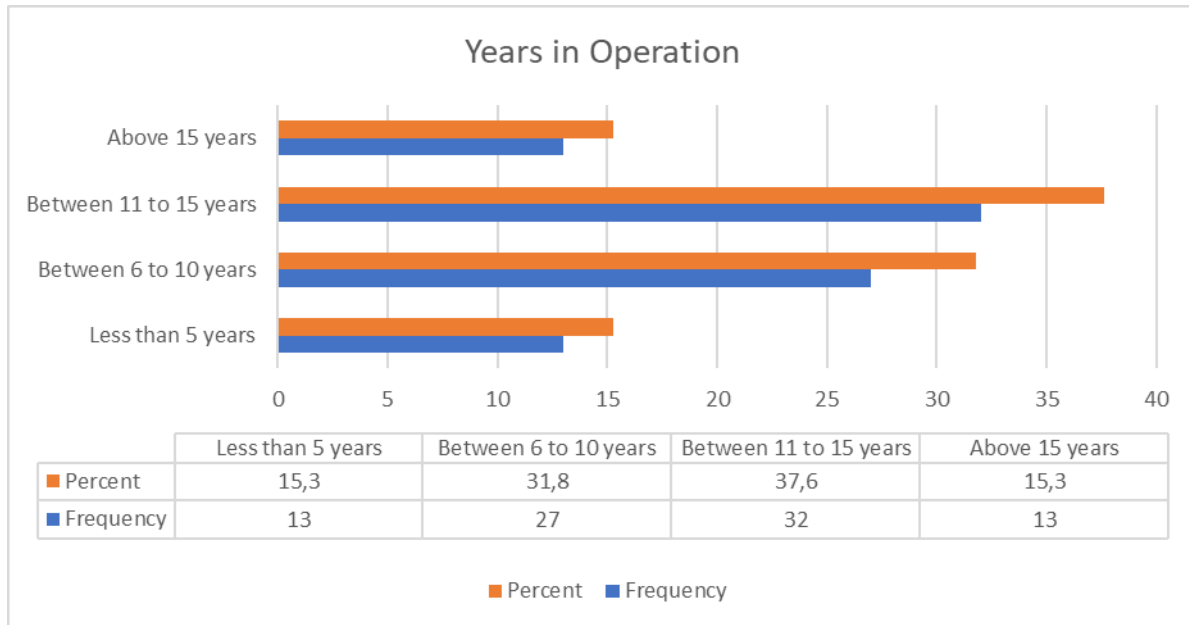


Figure 8: Number of years in operation

4. Discussion

The study results reveal a couple of challenges that the junior miners are facing and hence it hinders their performance. Based on the results, only a small percentage of miners have private investors. The majority of junior miners depend on bank loans which accumulate interest; to sustain their business. This means that even though they have contracts to supply coal to big companies like Eskom and Sasol, their proceeds go to paying off the loans. It therefore means that they require more clients that they can supply if they are to sustain and grow their business. This is supported by the results in Figure 8 which shows that the majority of these junior miners have been operational for more than ten years and yet they still face challenges financially or operational.

The lack of capital has also led to junior miners not being able to buy their own equipment. They have to use hired equipment or make use of contractors which is costly, and it also means the business does not have its own assets. If using a contractor, they have to share the proceeds, and they take about 80% of these proceeds which leave the miners back to where they started, with no money. The lack of capital by junior miners is also a contributor to not being able to employ relevant mining skilled personnel. The junior miners are unable to match the market related salary to pay for the relevant skills. They again have to contract the services of these personnel which include amongst others a mining engineer, environmentalist and geologist, who perform consulting services. This is further demonstrated by Figure 7 which indicates that the majority of the respondents found plant maintenance to be the most difficult operation. When interviewed, it was mentioned that this is because it is expensive to employ qualified and experienced maintenance personnel. This becomes a cycle and it hinders their growth. This explains why the majority of junior miners have been in business for more than ten years as seen in Figure 8 but they have not grown, expanded or still struggling financially.

When it comes to tonnage production, the majority of miners seem to be producing between 0.6mt to 10mt per annum as shown in Figure 5. This seems to indicate low production compared to what customers like Eskom consume per year. The lack of resources might be a contributing factor to this low production.

According to Figure 6, 14% of respondents use road to transport their cargo. Out of the 14% who use road transport, 80% of them indicated that they were unhappy with the damaged roads condition. They also expressed their concern regarding the high costs of using road transport, which in turn carries low load; 30 tons per truck to be precise. This means they have to pay for multiple trips to complete their delivery. There is also a high rate of truck breakdowns, which causes delays and costs more money. There was a strong view that the railway lines could be much convenient if they were closer to their mines and the sea port but they are far; which means they still have to transport their cargo by road to load into a train and again to transport to the port.

5. Conclusion

The aim of this study was to identify the factors that contribute to poor performance of junior coal miners in South Africa. The questionnaires and interviews were sent to 120 respondents of which 85 participated, which is about 71% response rate. The miners were asked basic questions in a questionnaire, and more information was extracted during the interviews.

The study revealed that the most common challenge for the junior miners is lack of capital and financial support. Though they received contracts from the likes of Eskom and Sasol, the money made from these contracts goes into bank repayments, contractors, consultants and transportation. This results in junior coal mines being unable to sustain their business which leads to poor performance and subsequently shut down. Government intervention is needed in a form of providing capital for purchasing equipment and funding for the miners to be able to pay salaries for the first few years. This will assist the miners to sustain the business as they will not have to borrow money from the banks.

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Biography

Zanele Mpanza is a Lecturer in the Department of Mechanical and Industrial Engineering at the University of South Africa. Zanele earned an M-Tech in Industrial Engineering from the University of Johannesburg. She is currently doing a Phd in Mechanical Engineering at the alma mater. Zanele's research interest include operations research, supply chain management, modelling and simulation, transport and traffic engineering.