DRIVERS AND BARRIERS TO SUSTAINABILITY MANUFACTURING PRACTICES BY SMALL AND MEDIUM ENTERPRISES IN SOUTH AFRICA

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ABSTRACT

Sustainable manufacturing (SM) is a key environmental initiative that can help to reduce the negative environmental impact of manufacturing. The study investigated the drivers and barriers to the implementation of sustainable manufacturing practices (SMP) by small and medium enterprises (SMEs) in the manufacturing sector. The study used the quantitative research approach. The cross-sectional survey method (self-administered questionnaire) was used for data collection. Data was collected from two hundred and fifty two owners/managers of SMEs in the manufacturing sector. The participants in the study were conveniently sampled. Descriptive statistics and factor analysis were used for data analysis. The Cronbach's alpha was used as a measure of reliability. The study identified four major drivers of SMP namely environmental, economic, management support and social. The major barriers to the implementation of SMP are financial, management and social factors. Limitations and recommendations to improve the implementation of SMP by SMEs are suggested.

Keywords: Sustainable, Manufacturing Practices, Drivers, Barriers, Small and Medium Enterprises, South Africa.

JEL classification: M1.

INTRODUCTION

According to the Organisation for Economic Cooperation and Development (2017), many countries are challenged by low economic growth, high unemployment rates and rising income inequality and poverty. Small and medium enterprises (SMEs) contribute to innovation, generate employment and are key to the reduction of poverty and income inequality (Ayyagari et al., 2007). The contribution of the SMEs is one of the reasons for the low rates of unemployment and high rate of economic growth in many developed countries (Pandya, 2012). In South Africa, SMEs account for about 34% of gross domestic product (GDP) and 60% of all employment (Abor & Quartey, 2010). The manufacturing sector is one of the biggest sectors in the South African economy. The sector is responsible for 13% of South Africa's gross domestic product in 2017 (Wentzel & de Hart 2015; Bhorat & Rooney, 2017). However, manufacturing activities often have a negative impact on the environment in the form of exploitation of natural resources, pollution, waste and energy consumption (Abdul Rashid et al., 2017). The contribution of South Africa to global emission is around 1.2%. South Africa is a signatory to the Kyoto Protocol on Climate change and intends to reduce emissions by 42% by 2025 (Vosper & Mercure, 2016).

Sustainable manufacturing (SM) by SMEs can help to reduce the negative impact of manufacturing on the environment especially since they are responsible for a sizeable amount of global emission and pollution. (Jyalf et al., 2010; Thanki et al., 2016). The aim of this study is to investigate the drivers and barriers to the adoption of SMP by SMEs.

Nordin et al. (2014) remark that many organisations respond to environmental issues based on the drivers and barriers. This study will make a contribution to the literature on the SMP of SMEs in a developing country where empirical studies are relatively few. Although SM is being practiced and commonly studied in developed countries, its application and research are at its infancy in developing nations (Abdul Rashid et al., 2017). The findings of this study can help manufacturing SMEs in South Africa to understand the factors that motivate and prevent the implementation of SM. South Africa contributes about 1.2% of global emissions and as a signatory to the Kyoto Protocol on Climate change, has promised to reduce emissions by 34% by 2020 and 42% by 2025 (Vosper & Mercure, 2016). Understanding the drivers and barriers to SMP is of significance in improving business sustainability and ultimately reducing the environmental challenges faced by South Africa and the world. The study is organised as follows: The definition of SMEs and the drivers and barriers to the implementation of SMP by firms will be discussed in the next section. This will be followed by the research methodology, results and discussion, conclusion and limitations.

LITERATURE REVIEW

Definition and role of SMEs in South Africa

A small business is defined in South Africa, as "*A separate distinct entity including cooperative enterprises and non-governmental organisations managed by one owner or more, including branches or subsidiaries if any is predominately carried out in any sector or subsector of the economy mentioned in the schedule of size standards*". The quantitative definition focuses on the turnover, the number of workers and the gross asset value of the business (Government Gazette, 2003). Table 1 shows the quantitative description of small businesses in the manufacturing sector in South Africa.

Table 1
QUANTITATIVE DEFINITION OF THE SMALL BUSINESSES IN THE MANUFACTURING SECTOR IN SOUTH AFRICA

Enterprise size	Number of employees	Turnover Rand (Million)	Gross assets excluding fixed property Rand (Million)
Micro	5	0.20	0.10
Very small	20	5	2
Small	50	13	5
Medium	200	51	19

Adapted from (Government Gazette. 2003).

Table 1 shows the definition of small businesses in the manufacturing sector in South Africa. Although, the small business space in South Africa includes micro, very small, small and medium enterprises, the term small and medium enterprises (SMEs) is generally used (Government Gazette, 2003). This study used the number of employees as the method of enterprises size classification.

Sustainable Manufacturing (SM)

The United States of America. Department of Commerce (2016) defines sustainable manufacturing as: "*The creation of manufactured products that use processes that minimize negative environmental impacts, conserve energy and natural resources, are safe for employees, communities, and consumers and are economically sound"*. Garetti & Taisch

(2012) define SM as "*The ability to use natural resources in manufacturing intelligently in order to fulfil economic, environment and social aspects and thus, preserves the environment and improve the quality of life"*. SM integrates financial profitability, social equity and environmental protection in the manufacturing process. The objective of SM is the reduction or elimination of the environmental impacts of manufacturing. This will be achieved through the strategies that reduce pollution, waste and energy consumption. SM involves not just the product and the manufacturing processes but the entire supply chain. At the product level, SM is no longer about the traditional 3R concept of promoting sustainable technologies (*reduce, reuse, recycle*) but now focuses on the 6R concept (*reduce, reuse, recover, redesign, remanufacture, recycle).* At the process level, SM takes into consideration activities such as process planning that helps to reduce toxic wastes, occupational hazards and energy consumptions, At the system level, SM focuses on the entire supply chain including all the major life-cycle stages such as pre-manufacturing, manufacturing, use and post-use, over many life-cycles (Jyalf et al., 2010; Abdul-Rashid et al., 2017).

The Resource Based View (RBV) and the Natural-Resource Based View (NRBV) form the theoretical basis for SMP. The RBV by Barney (1991) maintains that the major sources of competitive advantage for a firm are resources and capabilities. The NRBV by Hart (1995) contends that a firm's competitive advantage is grounded on its relationship with the natural environment in which it operates. The relationship with the environment consists of three interconnected strategies. These are (1) product stewardship which focuses on the minimisation of life cycle cost of products (2) pollution prevention through the minimisation of emission and waste and (3) sustainable development through the minimisation of the environmental problem of firm growth). Another theory that supports SMP is the Stakeholders Theory by Freeman (1984). Stakeholders are individuals and organisations that are impacted by the activities of a firm and include employees, customers, suppliers, communities and the environment.

Drivers of SMP

Abdul-Rashid et al. (2017) remark that drivers are factors that motivate companies to adopt SMP. The drivers of SMP can be internal or external. Internal drivers comprise of employee skills and competencies, technology available to employees, strategic intent, brand image, organisation culture and reputation, and environment management capability of the firm (Luthra et al., 2011; Yadav, et al., 2018). Internal factors also include personal values of owners, personal commitment, habit and lifestyle of owners, knowledge management and top management. A good ecological reputation and image attract customers, improves sales and legitimises firm existence. The benefits of SMP to a firm include cost reduction, increased profitability, competitive advantage, energy efficiency, recycling of products and the reduction of pollution, waste and material use (Gandhi et al., 2018; Thanki & Thakkar, 2018), External drivers include government, customers, suppliers, competitors and communities. Government can influence the environmental practices of SMEs through legislation, economic support and dissemination of information. Fines and penalties for non-compliance can drive SMEs to comply with environmental regulations and encourage them to introduce environmental sustainability practices. In addition, incentives such as tax concessions, grants and loans by government can facilitate behavioural change towards sustainability practices by SMEs (Cambra & Ruiz 2011; Sáez et al., 2016). Customers can also drive the environmental sustainability practices of SMEs through the dynamics of buyers' organisation and green demand (Sáez et al., 2016). Suppliers can also facilitate SMP through green supply and green procurement policy (Lee & Klassen, 2008). Competitors, environmental groups and communities can drive SMEs to be involved in environmental sustainability practices.

Competitors drive environmental sustainability practices through the introduction of environmentally compliant products and processes. (Williams & ODonovan, 2015; Testa et al., 2016). Studies by Nambiar (2010) and Amrina & Yusof (2012) find that the strongest drivers of sustainable manufacturing initiatives are product quality, company's image, market competitiveness, economic benefits, customers' environmental awareness, government regulations and stakeholders' environmental pressures. This is consistent with the findings of Nordin et al. (2015) that the drivers of SMP are environmental regulation, top management Commitment, company Image, economic benefits, environmental responsibility, public concern, long-term survival in the market and stakeholder pressure. The most important internal drivers of SMP are awareness and top management support. (Kulatunga et al., 2013). Abdul-Rashid et al. (2015) elicit the opinion of academicians about the drivers of SMP and find that the most important drivers are company image, improved competitiveness and enhanced product quality. The commitment to SMP is not only driven by economic aspects, but also the desire to gain approval from the public. Shankar et al. (2016) reviewed the drivers of SMP from the literature and expert opinions using the analytical hierarchy process (AHP), a multi-criteria decision making (MCDM) approach. This study finds that quality is the primary driver of SMP. Other important drivers in the order of ranking are financial benefits, stakeholders, customer expectations, delivery speed and performance flexibility, compliance with regulations, environmental conservation, optimised usage of resources, green purchasing and supply chain requirements. Aboelmaged (2018) investigates the impact of technological, organisational and environmental drivers on SMP. The model of the study was empirically validated by means of the partial least squares approach to structural equation modelling based on survey data from Egyptian SMEs. The findings reveal that top management support, engagement of employees and environmental pressures from stakeholders, positively impact on SMP. In contrast to the existing literature, environmental regulations, and technology infrastructure and technology competence do not significantly affect SMP.

Barriers to SMP

Amrina & Yusof (2012) find that many firms face difficulties in implementing SMP. The ranking of the barriers to SMP reveal that cost is the most significant barrier. Cost is a major limiting factor because access to external finance is limited for SMEs in South Africa (Otto, 2019). Two other major barriers according to Amrina & Yusof (2012) are lack of understanding and knowledge and lack of top management commitment. Other barriers are lack of preparation, resistance of employees to change, lack of data and standardisation, lack of vision, incorrect implementation and lack of infrastructure. Nordin et al. (2015) agree that the major barriers to the implementation of SMP by SMEs is cost. Other highly ranked barriers are lack of resources and technical expertise about SMP. Kulatunga et al. (2013) using spider diagrams find that the main barrier to the implementation of SMP by firms is lack of awareness by small businesses, followed by negative attitudes towards SMP. Factors such as lack of tax benefits, lack of awareness of local customers on green products are relatively insignificant. Bhanota et al. (2015) surveyed the opinions of industry practitioners and researchers about the barriers to the implementation of SMP in India. Major barriers include lack of awareness of sustainability concepts by small firms, lack of awareness of green products by customers, inadequate publicity about green products, negative attitudes towards sustainability concepts, lack of funds and high cost. Ghazilla et al. (2015) examine the effect of organisational factors, environmental knowledge, business environment, societal influences, technology, regulations, environmental, financial and suppliers as barriers to

SMP. The findings of the study demonstrate that the critical barriers that hinder the implementation of SMP by SMEs are weak organisational support and lack of funds.

RESEARCH METHODOLOGY

The study used the quantitative research approach and the descriptive research design. Data was collected through the use of self-administered questionnaire in a survey using the cross-sectional approach. Academic and industrial experts with knowledge in the field of SM examined the questionnaire for clarity. The survey was conducted in the Gauteng and Limpopo Provinces of South Africa. Gauteng Province was selected as it is the heartland of entrepreneurship in South Africa. Gauteng Province has the largest number of SMEs in South Africa. Limpopo Province also contains a sizeable number of SMEs. However, there exists no known single reliable sampling frame for SMEs in Gauteng and Limpopo Provinces, which made it difficult to adopt probability sampling method in selecting participating SMEs. Convenience and the snowball sampling methods were used to identify the survey participants. All the respondents in this study were in the manufacturing sector, and were owners or managers. Owners or managers were chosen because of their expected knowledge of the sustainability practices of their firms. A pilot study was conducted on the research instrument used in this research with 30 SME owners/managers. This helped to improve face and content validity. The questionnaire was divided into three parts: (1) biographical information; (2) drivers and (3) barriers. Descriptive statistics and factor analysis were used for data analysis. The Cronbach's alpha was used as a measure of reliability.

Drivers: Thirty five questions developed from the literature (Amrina & Yusof, 2012; Nordin et al., 2015; Abdul-Rashid et al., 2017) were used to examine the drivers of SMP. Survey participants were asked to rate the importance of the drivers on a five point Likert scale ranging from "*1*" low importance to "*5*" very important.

Barriers: Thirty questions developed from the literature (Amrina & Yusof, 2012; Kulatunga et al. 2013; Nordin et al. 2015; Ashari & Hassan, 2015; Abdul-Rashid, 2015). Survey participants were asked to rate the importance of the barriers on a five point Likert scale ranging from "*1*" low importance to "*5*" very important

RESULTS AND DISCUSSION

Response rate and biographical information

650 questionnaires with cover letters that explained the purpose of the study were distributed to owners and top managers of manufacturing SMEs. Out of the 280 questionnaires that were returned. 252 questionnaires were found usable as some respondents did not complete certain vital parts of the questionnaire. This yielded a response rate of 38.8%.

Table 2
BIOGRAPHICAL INFORMATION OF THE RESPONDENTS

Biographical Characteristics	Frequency (N = 252)
Educational qualification of respondents	
Below Matric	28
Matric	84
Post–Matric qualifications	140
Gender of the respondents	
Female	105
Male	147
Age of the respondents (years)	

Less than 20	0
20–30	5
31–40	60
41–50	94
Above 50	98
Age of the firm (years)	
Less than one	0
1–5	52
6–10	145
Above ten years	55
Number of employees	
No employees	0
1–5 employees	6
6-20 employees	36
21–50 employees	109
51–200 employees	101

The results as depicted by Table 2 show that the majority of the respondents are male with Post-Matric qualification, six to ten years of operation and can be classified as small businesses with between 21 and 50 employees. However, many medium-sized manufacturing SMEs (101) also participated in the study

Principal component analysis and descriptive statistics

The Principal component analysis was used for data reduction and for detection of structure or underlying dimensions of the drivers and barriers to the implementation of SMP.

Drivers of the implementation of SMP

Table 3
FACTOR ANALYSIS OF THE DRIVERS OF SMP

Variables	**Factor 1 Environmental**	**Factor 2 Economic**	**Factor 3 Management support**	**Factor 4 Social**
Reduction of energy use	0.8129			
Reduction of emission	0.7462			
Reduction of material use	0.6628			
Reduction of waste	0.6204			
Reduction of the use of non-renewable resources	0.5825			
Government environmental legislation	0.5308			
Improves recycling	0.4620			
Corporate environmental responsibility	0.4104			
Economic benefits		0.7205		
Improved product quality		0.6638		
Reduced production costs		0.1149		
Use resources more efficiently		0.5365		
Top management support			0.7108	
Employee skill and support			0.6364	
Company image			0.5193	
Customer demand for environmental products				0.7001
Green purchasing				0.6327
Increased customer environmental awareness				0.5518
Cronbach's alpha	0.806	0.784	0.741	0.739
Eigen value	9.862	6.490	3.988	1..840
% of variance explained	30.361	23.053	9.622	7.406

Items with factors loading less than 0.300 omitted

Table 4 DESCRIPTIVE STATISTICS OF THE DRIVERS		
Factor	Mean	Standard deviation
Environmental	4.150	1.026
Economic	3.500	0.991
Management	3.305	0.994
Social	3.220	0.996

Table 3 depict the results of the principal component analysis using Varimax rotated factor method for the drivers of SMP. To ensure the appropriateness of factor analysis, the Barlett Test of Sphericity (BTS) and Kaiser-Meyer-Olkin (KMO) were used. The results (BTS=488.596; sig. =0.001)) and the KMO (0.724) support the use of factor analysis. Four factors accounted for 70.442% of the total variance. Factor one is named "*Environmental*" and consists of seven items. The Eigen value is 9.862 and the percentage of variance explained is 30.361 with a Cronbach's alpha of 0.806. Factor two is labelled "economic" and consists of four items. The Eigen value is 6.490 and the percentage of variance explained is 23.053with a Cronbach's alpha of 0.794. Factor three is labelled "*Management support*" and consists of three items. The Eigen value is 3.988 and the percentage of variance explained is 9.622 with a Cronbach's alpha of 0.741. Factor four is named "social" and comprises of three items. The Eigen value is 1,840 and the percentage of variance explained is 7.406 with a Cronbach's alpha of 0.739.

Table 4 depicts the descriptive statistics of the summated scales of the factors. Descriptive statistics for the drivers of SMP show that the factor with the highest mean is environmental with a mean of 4.150 and standard deviation of 1.026. This factor is a combination of both internal and external variables. Environmental drivers of SMP include recycling, energy efficiency and waste and pollution minimisation. Recycling involves the collection and processing of materials that would have been thrown away as waste and turning them into new products. Energy efficiency can be described as the percentage of total energy that is consumed in producing goods and services and not wasted as useless heat. Energy efficiency aims to reduce the amount of energy needed to produce or provide goods and services. Waste minimisation focuses on the processes and practices that are aimed at reducing the amount of waste produced by an individual or an organisation. Pollution minimisation involves practices to eliminate or reduce the creation of pollutants. These variables are important in the implementation of SMP (Alayon et al., 2017). An important external factor driving SMP is government regulations. In South Africa the National Strategy for Sustainable Development and Action Plan (NSSD) was approved by government in 2011. The National Framework for Sustainable Development was launched in 2008 with the aim of promoting the effective stewardship of South Africa's natural, social and economic resources. The commitment of South Africa to a long-term sustainable development path that is economically, socially and environmentally sustainable, requires scientific, technological and innovation capabilities, reinforced by strategic public investments and strategic partnerships with key stakeholders. All these measures will help South Africa's transformation into a green economy. Other key legislations and regulations) have been enacted. These include the: Hazardous Substances Act No. 15 of 1989, National Environmental Management Act No. 107 of 1998 (NEMA). National Environmental Management: Air Quality Act No. 39 of 2004 (NEM:AQA) (Department of Environmental Affairs, 2018). There is also Environmental Regulations for Workplaces, 1987 (Department of Labour, 2018). Greening the economy is of significant importance to South Africa as it can lead to the reduction of high carbon impact and create employment. Based on this growth path, the Green Industries Special Business Unit was established by the Industrial Development Corporation (IDC) in 2011 with the goal of investing R22 billion in green industries over the next 5 years. This amount will be

disbursed to firms focusing on cleaner production methods, cleaner energy generation, increased energy efficiency, pollution mitigation and waste reduction. Thus, there is a combination of government regulations and government support to improve SMP in South Africa (Borel & Turok, 2013).

In addition, corporate environmental responsibility is a major driver of SMP. Firms are not only responsible to their shareholders but to the whole society as one of the contributors to economic development. Firms are not only accountable for production and market demands, but also resource conservation and environment protection. Firms need to initiate environmental protective activities. Corporate environmental responsibility demonstrates a firm's understanding and undertaking of activities to reduce environmental problems. Corporate environmental responsibility is a key part corporate social responsibility and can help to improve firm competitiveness and performance. Corporate environmental responsibility also helps a firm to build an environmentally responsible image and reputation (Yu et al., 2011; Yang et al., 2017).

Another major driver is economic factor with a mean of 3.500 and standard deviation of 0.991. The economic benefits of SM include the reduction of production costs, workforce for reprocessing aspects, and costs for guarantees. These economic benefits are linked to operating benefits such as product quality, competitiveness, productivity, and efficiency of the processes. Economic benefits also include market expansion, better customer service, increase the number of products classified as green increase in sales reduction of marketing costs, reduction of material waste, reduction of production costs and reduction of workforce for reprocessing (Mendoza et al., 2019). Another important driver of SMP is management support with a mean of 3.305 and standard deviation of 0.994. Management support helps to create the organisational culture and employee capabilities necessary for the successful implementation of SMP. Aboelmaged (2018) find that top management support and engagement of employees positively impact on SMP. In addition, there is a significant positive relationship competitive capabilities which can be reinforced through management support for training on SMP. Management support can stimulate employees, provide financial support and a positive attitude towards sustainability initiatives. Another important driver of SP is social factor with a mean of 3.220 and standard deviation of 0.996. The factor focuses on the influence of customers and suppliers on the implementation of SMP. Environmental pressures by suppliers, competitors, community and customers can positively affect the sustainability initiatives of a firm (Abdul et al., 2017; Aboelmaged, 2018).

Barriers to the implementation of SMP

Table 5
FACTOR ANALYSIS OF BARRIERS

Variables	Factor 1 Financial	Factor 2 Management	Factor 3 Social
Limited financial resources	0.8106		
High cost of SMP	0.6428		
High training costs	0.5966		
Lack of technical expertise		0.7201	
Inadequate management support		0.6094	
Lack of SMP culture		0.5814	
Lack of SMP knowledge		0.5292	
Difficulties in obtaining green input		0.4869	
Lack of awareness by employees about SMP		0.4328	
Lack of awareness of green products by customers			0.7008

Difficulty in obtaining green raw materials from suppliers			0.6617
Weak public pressure			0.5980
Low green attitude by the society			0.5169
Cronbach's alpha	0.782	0.726	0.719
Eigen value	8.088	4.396	2.963
% of variance explained	30.279	25.601	14.659

Items with factors loading less than 0.300 omitted

Table 6
DESCRIPTIVE STATISTICS OF BARRIER

Factor	Mean	Standard deviation
Financial	4.250	1.009
Management	3.450	1.002
Social	3.290	0.995

Table 5 depict the results of the principal component analysis using Varimax rotated factor method for the barriers to the implementation of SMP. To ensure the appropriateness of factor analysis, the Barlett Test of Sphericity (BTS) and Kaiser-Meyer-Olkin (KMO) were used. The results (BTS=609.193; sig.=0.001)) and the KMO (0.840) support the use of factor analysis. Three factors accounted for 70.539% of the total variance. Factor one is named "*Financial*" and consists of three items. The Eigen value is 8.088 and the percentage of variance explained is 30.279 with a Cronbach's alpha of 0.782. Factor two is labelled "*Management*" and consists of six items. The Eigen value is 4.396 and the percentage of variance explained is 25.601 with a Cronbach's alpha of 0.726. Factor three is labelled "social" and consists of four items. The Eigen value is 2.963 and the percentage of variance explained is 14.589 with a Cronbach's alpha of 0.719.

Table 6 depicts the descriptive statistics of the summated scales of the factors for the barriers to the implementation of SMP. Financial factor with a mean of 4.250 and standard deviation of 1.009 is a major barrier to the implementation of SMP. Cost is a major limiting factor especially considering that internal funds are not adequate for SMEs and access to external debt and equity is limited for SMEs in South Africa. There is credit rationing for SMEs in South Africa. Inadequate management support is another important barrier with a mean of 3.560 and a standard deviation of 1.002. Management need to create the awareness and training to improve technical capabilities and also provide financial support for SMP. This is consistent with the findings of Amrina & Yusof, (2012); Nordin et al. (2015); Bhanota et al. (2015); and Ghazilla et al. (2015) that a critical barrier that hinders the implementation of SMP by SMEs is the lack of management support Another important barrier to the implementation of SMP is social factor. Lack of support from suppliers, weak pressure from customers, community and environmental support groups can lead to inactivity in the implementation of SMP by SMEs (Kulatunga et al., 2013; Bhanota et al., 2015). Figures 1 and 2 depict the conceptual models of drivers and barriers of SMP based on the findings of the study.

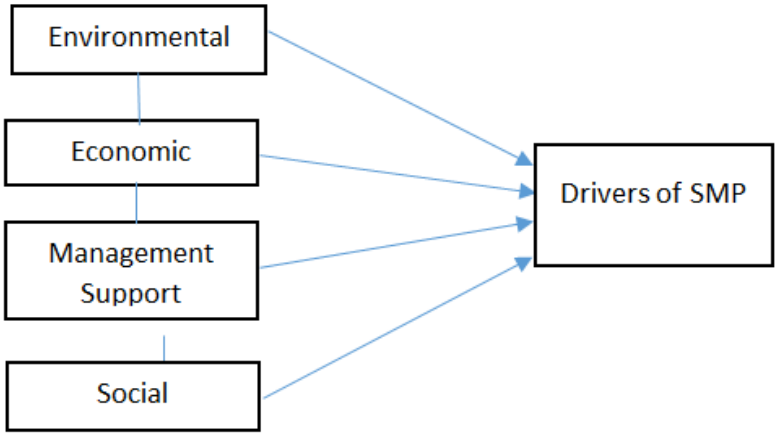

FIGURE 1
DRIVERS OF IMPLEMENTATION ON SMP

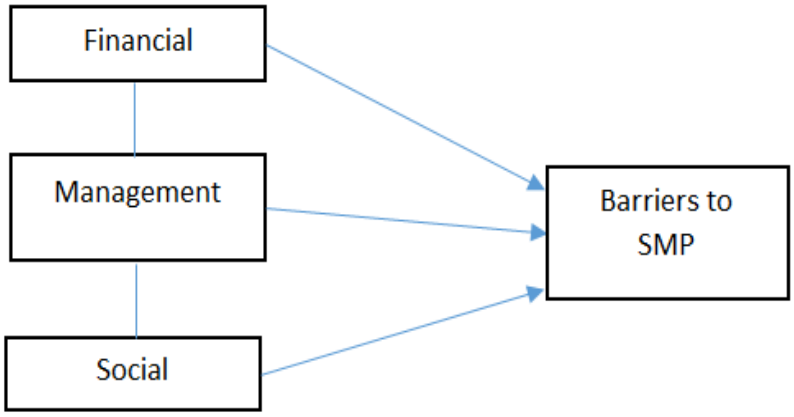

FIGURE 2
BARRIERS TO IMPLEMENTATION OF SMP

CONCLUSION

This paper investigated the drivers and barriers to the implementation of SMP by manufacturing SMEs in South Africa. Despite the contributions of the manufacturing sector to employment and economic growth, its activities and operations have impacted negatively on the environment. There is the need for the implementation of environmental initiatives in the manufacturing industry. Factor analysis of the drivers of SMP revealed four factors namely environmental, economic, management support and social. These factors are a combination of both internal and external variables. Factor analysis revealed three barriers to SMP implementation. These are financial, management and social and are also a combination of both internal and external variables. The empirical findings of the drivers and barriers to the implementation of SMP involve many stakeholders and can be linked to Stakeholder theory and the Natural-Resource Based View (NRBV) of the firm. Empirically, the study contributes to the literature on the drivers and barriers of the implementation of SMP a from a developing country perspective. The findings of the study can help small business owners to develop strategies to improve the implementation of SMP by attending by attending training and seminars. In addition, top management of SMEs can demonstrate their commitment to the implementation of SMP through direct involvement or by appointing a manager that will be responsible for environmental issues. There is also the need for government to assist

SMEs with funding to aid the implementation of SMP. Government and sustainability focused non-governmental organisations can also help to create awareness for green products. This will stimulate SMEs to incorporate SMP in their production processes. The study has some limitations. The study used convenience sampling method because of the difficulty in obtaining the population and sampling frame of SMEs in the study area. Also, only 252 SMEs participated in the survey. Therefore, care should be exercised in generalising the findings of the study. Additional studies can investigate the effect of SMP on sustainable performance. A cross-country study of the drivers and barriers to the implementation of SMP can be explored.

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