

An Assessment On The Implementation Of Sustainable Supply Chain Management (Green Public Procurement) A Case Study In The City Of Johannesburg Municipality

Kanakana Ernest Mutenda

Faculty of Engineering and the Built Environment
University of Johannesburg, PO BOX, 524,
Auckland Park, 2006, South Africa

Abstract

Green public procurement (GPP) in South African local government is still at its infancy stage. The municipalities of City of Johannesburg (CoJ), Cape Town, eThekweni, Ekurhuleni, Nelson Mandela Bay and Tshwane (all members of International Council for Local Government Initiatives (ICLEI) committed in 2002 at the World Conference on Sustainable Development (WSSD) to pursue some form of GPP, however none of these municipalities has developed a fully-fledged policy on GPP. GPP is one of the new strategies that are being adopted globally to assist local governments in providing solutions for sustainable development and to embrace the green economy through the implementation of long-term sustainable policies and strategies. The incorporation of green procurement elements into current supply chain policies of municipalities can be the first and most inexpensive step in achieving a successful green procurement programs. Municipalities spend a large portion of their budget on procurement and if they use their purchasing power by choosing to procure environmentally friendly goods and services, they can make an important contribution to sustainable consumption and production. The integration of green criteria in local government procurement would provide opportunities for: improved efficiency, reduced resource use, reduce greenhouse gas emissions, cost savings and enhanced environmental and social outcomes. The aim of the research was to determine factors that affect implementation of GPP practices in the City of Johannesburg municipality. A qualitative research approach was used to collect opinions, perceptions and attitudes from 100 targeted procurement personnel, management and executives from the CoJ municipality using a survey instrument and it concludes that there is a need to confront lack of knowledge and training as critical in driving the implementation of GPP.

Key words

Green Public Procurement, Bid specification, Cost of green products, Training and awareness and Management practices

I. Introduction

The term “Green public procurement” is still an emerging concept and it has been explained in different ways, one definition is that it is “a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured” (European Commission, 2011). Municipalities spend a large portion of their budget on procurement and if they use their purchasing power by choosing to procure environmentally friendly goods and services, they can make an important contribution to sustainable consumption and production, or what is called Green Public Procurement (GPP) or green purchasing. The integration of green criteria in local government

procurement thus would provide opportunities for: improved efficiency, reduced resource use, reduce greenhouse gas emissions, cost savings and enhanced environmental and social outcomes (European Commission, 2011). GPP is one of the new strategies that are being adopted globally to assist local governments in providing solutions for sustainable development and to embrace the green economy through the implementation of long-term sustainable policies and strategies. The incorporation of green procurement elements into current supply chain policies of municipalities can be the first and most inexpensive step in achieving a successful green procurement programs. There are numerous factors that are affecting implementation of GPP in many local authorities in South Africa such as price, availability, and insufficient knowledge, lack of political commitment, purchasing habits, no acceptable alternative to current product and no 'green' specifications provided by supplier amongst other challenges.

2. Literature review

This section reviews techniques and methods used to determine the variables that affect the implementation of green procurement globally.

A research on the state of green activities in computer parts manufacturers was undertaken in Thailand by Ninlawan et al (2010). They collected data from 11 manufacturers using a questionnaire method to measure the Green Supply Chain Management (GSCM) practices, GSCM performance and GSCM pressures/drivers. Both environmental and positive economic elements were found to be significant factors of GSCM performance. Testa et al., (2012) assessed the factors that influence the inclusion of green criteria in public tenders using qualitative data of a sample of 156 public organisations from three Italian regions collected by a standard questionnaire. The researchers tested variables such as the level of awareness of the existing and available toolkits to support GPP, the dimension of public authorities, the adoption of a certified Environmental Management System (EMS), and the use of external expertise. The logistic model and the Orbit model indicated that awareness of GPP initiatives and tools is highly significant in determining both the choice to adopt GPP and the number of tenders that are adopted with the inclusion of environmental criteria.

The knowledge of real estate developers in adopting GPP and the barriers encountered in real estate development within the context of Chinese real estate was examined by Shen et al., (2017) using a hierarchical cluster analysis method. The study revealed that real estate developers in Chongqing China were not knowledgeable of green procurement and green building materials. The most significant barriers contributing to a little understanding of green procurement was lack of incentive policies and minimal marketing benefits, technical concerns with using green building materials, and a shortage of green building in the local market.

Agyepong and Nhamo (2016) analyzed the legislative provisions for green procurement in South Africa's metropolitan municipalities in the context of climate change and sustainable development. They used the interview and document analysis method (Bailey, 1994; Creswell, 2003). The documents which were retrieved and analysed included integrated development plans, supply chain management policies, environmental policies, integrated waste management policies, climate change policies, green procurement guidelines and green procurement implementation strategies. Although all four metropolitan municipalities had some form of procurement policy or document in place, only the City of Cape Town and eThekweni Metropolitan had incorporated green procurement strategies into their supply chain management. The City of Cape Town and Nelson Mandela Bay Metropolitan emerged as the only municipalities with a stand-alone green procurement strategy in South Africa.

(Rogerson and Sims, 2012) published an article on greening of urban hotels in South Africa. Key interviews were undertaken with: (1) members of the Green Building Council of South Africa, the national body that regulates the development of green construction or sustainable buildings; (2) the most important certification agency, Heritage Environmental Management, the South African partner of the Green Globe brand, and (3) Fair Trade in Tourism South Africa, a non-governmental organization which awards trademark certification to tourism businesses that adhere to Fair Trade practices. The results of this examination of urban hotels in Gauteng confirm earlier findings about the "low level of support for responsible tourism initiatives in the hotel industry" (Van der Merwe and Wöcke, 2007). The urban hotels in Gauteng only adopted greening practices that improved profits or sought enhanced public relations. The greening is driven by the vision of top management and by individual hotel managers (Seif, 2011). The cost, age of a hotel and market segment also played an important role in driving the green initiatives with one interviewee acknowledging that whilst green initiatives were important, it was not a priority as compared to such issues as the

comfort and safety and security of their guests. The other significant limitation is low domestic consumer awareness and demand for green hotels in South Africa.

(Smith and Perks, 2010) outlined the perceptions of businesses regarding the impact of green practice implementation on the business functions. A self-administered questionnaire was completed by 298 owners, managers and employees in businesses within the Nelson Mandela Metropolitan Municipality. The term 'green businesses' is defined by (Smith et al 2003) as businesses and practices that are viewed as environmentally sound, including the use of organic and natural products to build factories, tighter protection against emissions and environmentally friendly sourcing of materials. The researchers conducted the ANOVA test to determine the relationship between the independent variables; type of industry; size of business; position occupied; functional area employed; years' involvement with green practices; ethnic group and age with the dependent variable; perceptions of the impact of green practice implementation on the business functions. The variables with the highest positive r-value (strongest positive relationship) were found in the marketing/sales factor/ function (0.8031), while the variable with the lowest positive r-value (weakest positive relationship) were found in the manufacturing/operations factor/function (0.1137). It was found that the functions least impacted by green business practices are general management/human resources, purchasing/supply chain management and finance/information technology. Further analysis of the business functions reveals that the manufacturing/ operations, marketing/sales and distribution/logistics functions are the most impacted by green business practices.

(Windapo A, 2014) investigated the key drivers of green building in the Western Cape Construction Industry of South Africa. Interviews were conducted with professional team members (Architect, Engineers—mechanical, electrical, structural and quantity surveyors) who were involved in the construction of each certified building by the Green Building Council of South Africa. The data was then analyzed using a thematic analytical technique identifying key themes and subthemes. The findings reveal that the key drivers of green building include rising energy costs, the industry's Green Star rating system, competitive advantages and legislation. The author concluded that the drivers of green building are financial rather than environmental. It is also concluded that without a sound business or economic case, such as downstream financial benefits due to reduced operating costs and higher rental income, and without government regulations to support the construction of green buildings, very few clients would develop green buildings for the sole purpose of environmental sustainability. The study recommended that the South African government implement legislative measures and building regulations in support of green building design and construction.

(Bolton P, 2008) researched on the incorporation of environmental considerations in the existing legislators in South Africa. Bolton looked at factors such as the drawing up of tender or technical specifications; ensuring the capability or responsibility of contractors; the use of criteria to compare different tenders; and ensuring that eventual performance under a contract is environmentally sound. The aim of the paper was to show that South African organs of state can use procurement as an environmental policy tool to contribute to sustainable development as they have commendably done so to address past discriminatory policies and practices. The author recommended that the considerations can be included at that preparatory stage (pre-tender stage) so that the tender application could stipulate that they will only consider contractors with green products or services. Environmental criteria can further be applied during the award stage provided that they are specific and objectively quantifiable; are expressly mentioned in the tender documentation; and generally comply with the principles of fairness, equity, transparency, competitiveness and cost-effectiveness.

3. Research Methodology

A survey instrument was designed on a five point likert scale: Strongly Agree=5, Agree=4, Neutral=3, Disagree=2 and Strongly Disagree=1; and sent to targeted procurement personnel, management and executives using Google Forms. A total of 100 questionnaires were completed and returned out of the total 120 giving a response rate of 83%. The responses collected were exported to Microsoft excel and then imported into a statistical packages, namely IBM SPSS and STATA for data preparation and analysis. The responses were then coded (assigned values from 1-5) with 1 representing Strongly Disagree and 5 representing Strongly Agree. Descriptive statistics including frequency tables, cross tabulations, graphs and charts were performed to give a high level understanding of the data. In order to measure the variables of Management Practices, Cost of green products, Training and Awareness, and Bid Specification, composite scores for each variable were calculated per respondent. All the variables in this study are based on survey results and to overcome common method bias the researcher used Harman's single factor test to check for bias Chang et al (2010). The reliability of the instrument was measured using Cronbach's alpha to determine the internal consistency of the instrument. To test validity of the instrument, principal component analysis with an orthogonal

rotation and varimax rotation on all items of the variables in the study was conducted. Kaiser's rule of factors with eigenvalues larger than 1 will remain in the instrument. Factors lower than the cut off of 1 were dropped from the study. Scree plots were used to complement the eigenvalue scores for decisions on which factors to drop. Rotation of factors ensure a simpler interpretation of each factor.

4. Data analysis

4.1 Bid Specifications

When participants were asked to give their perceptions on whether the CoJ considered the environmental criteria when purchasing goods and the majority 46% do not think that criteria is taken into consideration as compared to 11% who indicated agreed. In the analysis (see figure1) 55% indicated that Preferential Procurement Policy is the most considered criteria when procuring goods followed by Black Economic Empowerment (23%) and Price (18%).

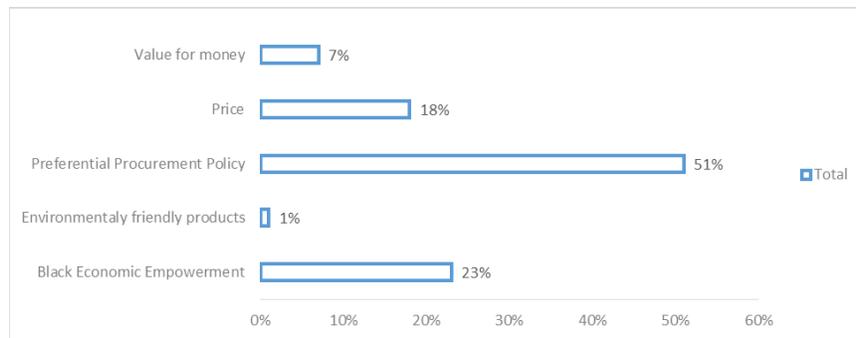


Figure 1: Identify the key criteria used in the council procurement decisions

4.2 Cost of green products

The participants were asked to share opinions on whether they feel that the cost of green procurement products is highly determined by availability and the majority (56%) indicated that the cost is determined by availability, whilst 9% disagreed. The research wanted to ascertain if there is a greater perception amongst the municipality employees that green procurement products are costly and the majority (52%) indicated that the products are costly as compared to 21% who disagreed (see figure 2). In a survey conducted by the RetailMeNot, a leading digital company that helps consumers save money, a survey was conducted between February 23 and 27, 2015, among 1,023 U.S. residents ages 18 and over and found that more than 4 in 5 (81%) consumers think environmentally friendly items are more expensive than non-green products.

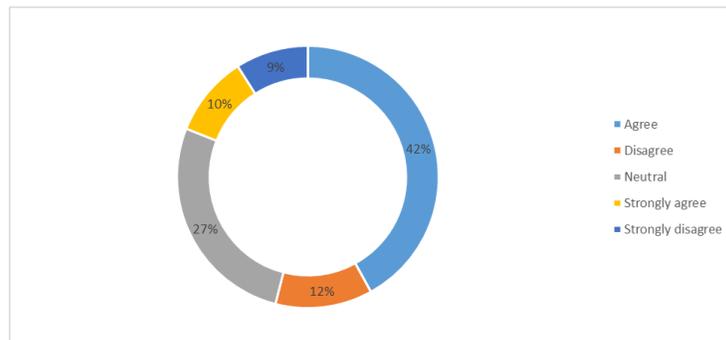


Figure 2: There is a greater perception that green procurement products are costly

4.3 Training and Awareness

The participants were asked questions relating to Training and Awareness in their workplaces and at least 88% (see figure 3) confirmed that lack of knowledge greatly affect the implementation of green procurement. knowledge of environmental issues positively influenced consumer intention and actual purchase of green products Chang et al (2010). A lack of awareness or understanding of green procurement by the personnel interviewed therefore indicates gaps in the implementation of green procurement. In most cases where plans to introduce or develop a green procurement policy were in place according to the environmental expert interviewed, the financial expert interviewed was unaware of the initiative.

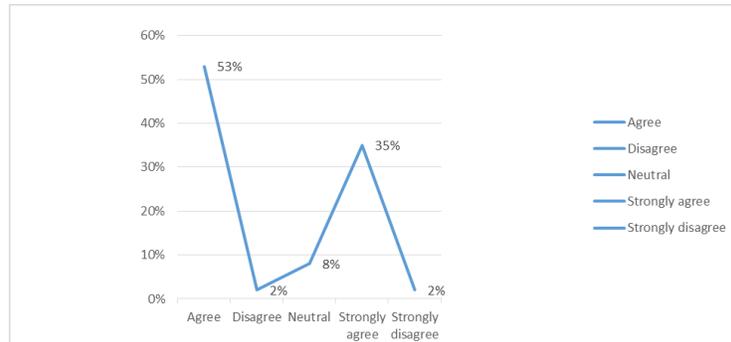


Figure 3: Lack of knowledge about the environment and how to develop green procurement knowledge criteria greatly affects the implementation of green procurement.

4.4 Management Practices

Participants were asked to share their views on whether Management promote and supports green procurement initiatives and 55% of respondents were neutral whilst 22% of respondents were in agreement and 23% of the respondents disagreed (see figure 4). (Friend G, 2009) found out that top management commitment is the key factor for both green procurement and green supplier development. The support of senior executives is considered as one of the principal internal drivers of environmentally responsible procurement.

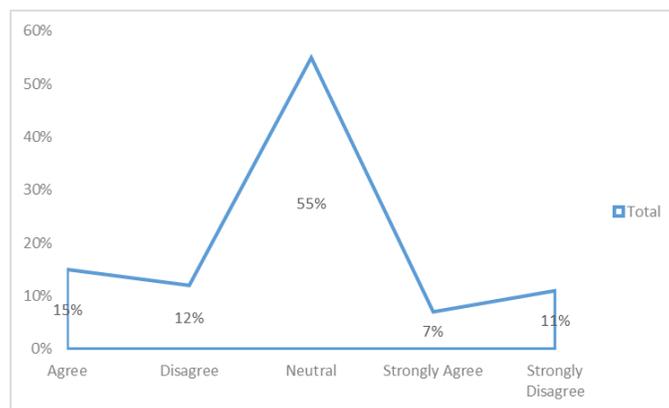


Figure 4: Management promotes and supports green procurement initiatives within the organization

5. Summary of key findings

The study found out that the majority of the participants indicated that Management practices (51%), Cost of green goods (55%) can greatly affect the implementation of green procurement. The greater majority of the participants

(72%) indicated Training and Awareness positively was the most important factor of green procurement implementation whilst 54% indicated that Bid Specification also plays an important role. Testa et al. (2014) found that training initiatives and the availability of information that increases the knowledge of green public procurement are strong drivers for adopting green procurement practices. Asked whether they knew about the existence of the environmental policy and green procurement policy, 60% of the participants responded yes to environmental policy and only 23% ticked yes to green procurement policy. The 23% could possibly be referring to the environmental policy since to the best of our knowledge the city of Johannesburg does not currently have an existing green procurement policy. Policies such as environmental policy, SCM policy, waste management policy and energy and climate change policies are used to make reference to green procurement. OECD (1996) recognized the significance of government involvement in integrating environmental criteria in public procurement. They recommend the development of procurement policies geared towards improving environmental performance, by governments. They also recommend that governments should establish effective platforms for consultation, training, awareness-raising programmes, and regulations among ministries and agencies so as to assist in the integration of environmental aspects in decision-making processes. The canonical correlations between Cost of green goods and Green Implementation was highly related with a value of 0.8325, Management Practices and Green Implementation was 0.20, Training and Awareness and Green Implementation was 0.4587, Bid Specification and Green Implementation was 0.086. These results show that the first three of the four canonical correlations are statistically significant at 5% level of significance. The results of the regression analysis indicated that the Cost of green products, Management Practices and Training and Awareness are significant factors of green implementation in the city of Johannesburg at 5% level of significance. Thus awareness campaigns on green procurement initiatives and tools would be highly significant in deciding to implement green procurement (Testa, Iraldo, Frey & Daddi, 2012).

6. Recommendations

The findings of this study recommends that the city of Johannesburg municipality to consider following the Supplier approach whereby the suppliers will be encouraged to evaluate their environmental performance and thereby being awarded a Green Certificate. Suppliers should be encouraged to promote their green products to demonstrate their quality and performance in comparison with conventional products. We also recommend the city to consider developing a programme of knowledge sharing for all employees to promote and raise awareness on green procurement, its benefits and external drivers, to increase interest. Have specific training for employees with responsibility for choosing goods, and for employees who vet contracts. Lack of awareness and information may be the cause of resistance to change, therefore ensuring that there are open and effective channels of communication may reduce the possibilities of resistance to change (Boohene & Williams, 2012). Develop a series of educational programmes to continually improve market awareness and keep up with the latest developments in green products and services. Build research and keeping up to date with new products into employees' training requirements through appraisal systems and Continuing Professional Development. Investigate joint tendering with other organisations to gain better prices for green products and services. Develop a formal green procurement policy, either as a stand-alone document or as part of the main procurement policy that is adopted at the organisation level and a regular review of the policy. This is one of the key ways to overcome barriers to green procurement, as it will provide clear aims and objectives for the organisation.

Buying Green (2004) advises the following criteria to implement green procurement:

1. Consider which products, services or works are the most suitable on the basis both of their environmental impact and of other factors, such as the information you have, what is on the market, the technologies available, costs and visibility.
2. Recognize your requirements and express them suitably.
3. Draw up clear and precise technical specifications, using environmental factors where possible (pass/fail conditions).
4. Consider environmental performances, such as the use of raw materials, sustainable production methods (where relevant for the end product or service), energy efficiency, renewable energies, emissions, waste, 'recyclability' and dangerous chemicals.

5. Establish selection criteria on the basis of the exhaustive list of criteria mentioned in the public procurement directives. Where appropriate include environmental criteria to prove technical capacity to perform the contract.
6. Advise potential service providers and contractors that they can utilize environmental management plans and declarations to demonstrate compliance with the criteria.
7. Establish award criteria: where the criteria of the ‘economically most advantageous tender’ is chosen, insert relevant environmental criteria either as a benchmark to compare green offers with each other (in the case where the technical specifications define the contract as being green) or as a way of introducing an environmental element (in the case where the technical specifications define the contract in a ‘neutral’ way) and giving it a certain weighting. Included in this step is the consideration of life-cycle costing.
8. Use contract performance clauses as a way of setting relevant extra environmental conditions in addition to the green contract.

7. Conclusions

The research aimed to determine the factors that affect the implementation of green procurement practices in local government in the City of Johannesburg and provide the recommendations to the council. The gap analysis conducted on Environmental Management System development indicates that the City of Johannesburg must reduce on its unsustainable consumption patterns. The literature review section discussed initiatives, activities, plans and projects that have been undertaken by different government authorities globally to implement green public procurement. The government is well positioned to promote environmentally-friendly products and business activities through GPP policies or strategies that would encourage development and diffusion of environmentally sound goods and services in the procurement process. The results of the regression analysis indicated that the Cost of green products, Management Practices and Training and Awareness are significant factors of green implementation in the city of Johannesburg at 5% level of significance. The research also concludes that although the city of Johannesburg has made significant progress in adapting to green transition through various initiatives, green policy documents has to be developed and adopted at organizational level.

Acknowledgements

I would like to thank the National Research Foundation (NRF) for making this research possible. My thanks goes to everyone at the city of Johannesburg municipality who responded to the research survey. And I would like to thank God and my family for the strength and wisdom.

References

- Arisa, E. & Muturi, W.2016.Constraints influencing the implementation of green procurement-a survey of public institutions in Kisii,Kenya: International journal of social sciences and information technology.
- Bailey, K.D. 1994. Methods of social research. 4thed. New York: Free Press.
- Bolton, P., 2006. Government procurement as a policy tool in South Africa. Journal of public procurement, 6(3), pp.193-217.
- Bolton, P., 2008, February. Protecting the environment through public procurement: the case of South Africa. In Natural Resources Forum (Vol. 32, No. 1, pp. 1-10). Blackwell Publishing Ltd.
- Boohene, R. & Williams, A. A. (2012). Resistance to Organizational change: A Case Study of Oti Yeboah Complex Limited. International Business and Management, 4 (1), 135-145. DOI:10.3968/j.ibm.1923842820120401.1040
- Bryman,A &E. Bell. 2015. Business Research Methods.International 4th ed.London: Oxford University Press.
- Buying Green – A Handbook on Environmental Public Procurement (2004), European Commission

- Carter, C. R., M. M. Jennings. 2004. The role of purchasing in corporate social responsibility: a structural equation analysis. *Journal of business Logistics*, 25(1): 145-186.
- Chang, S., Witteloostuijn, A.V. & Eden, L. 2010. Common method variance in international business research. *Journal of International Business Studies*, 4:178-184.
- European Commission. (2011). *Buying green! A handbook on green public procurement*. European Commission.
- Friend, G. 2009. *The Truth about Green Business*, 1st edition. New Jersey: Pearson Education
- Hair J.F.Jr, Black W.C., Babin B.J. & Anderson, R.E. 2014. *Multivariate Data Analysis*. 7th ed. Essex, England: Pearson Education Limited.
- Kipkorir, L.E. & Wanyoike, D.M. 2015. Factors Influencing Implementation of Green Procurement in multinational tea companies in Kericho County. *International Journal of Economics, Commerce and Management*, 3(6):431-444.
- Leedy P.D. & Ormrod, J. E. 2014. *Practical research planning and design*. 10th ed. Essex, England: Pearson Education Limited.
- Ninlawan, C., Seksan, P., Tossapol, K. & Pilada, W. 2010. The implementation of green supply chain management practices in electronics industry. *Proceedings of the international multiconference of engineers and computer scientists*, 3:17-19.
- OECD. (1996). *Recommendation of the Council on Improving the Environmental Performance of Government*. Retrieved February, 2018 from <http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=43&Lang=en&Book=False>
- Quinlan C., Babin E., Carr J., Griffin M. & Zikmund, W.G. 2015. *Business Research Methods*. London: CENGAGE Learning.
- Rogerson, J.M. and Sims, S.R., 2012, September. The greening of urban hotels in South Africa: Evidence from Gauteng. In *Urban forum* (Vol. 23, No. 3, pp. 391-407). Springer Netherlands.
- Seif, J. (2011). Interview, Executive Director, Fair Trade in Tourism South Africa, Johannesburg 17 October.
- Shen, L., Zhang, Z. & Long, Z. 2017. Significant barriers to green procurement in real estate development. *Resources, Conservation and Recycling*, 116:160-168.
- Smith, E.E. and Perks, S., 2010. A perceptual study of the impact of green practice implementation on the business functions. *Southern African Business Review*, 14(3).
- Smith, S.E. 2003. What is green business? [Online] Available at: <http://www.wisegeek.com/what-is-green-business.htm>. Accessed: 16 February 2010.
- Testa, F., Iraldo, F., Frey, M. & Daddi, T. 2012. What factors influence the uptake of GPP (green public procurement) practices? New evidence from an Italian survey. *Ecological Economics*, 82:88-96.
- Windapo, A.O., 2014. Examination of green building drivers in the South African construction industry: Economics versus ecology. *Sustainability*, 6(9), pp.6088-6106.

Biography

Mr Ernest Mutenda is an Assistant-Director of the Governance cluster committees in the City of Johannesburg municipality legislature, he holds a B Tech degree in Management Services from the University of Johannesburg (UJ), National certificate in Municipal governance (UJ), Monitoring and evaluation certificate of competence from the University Of Witwatersrand School Of Governance. He is a registered M Tech –Operations management student at (UJ).