

THE RELATIONSHIP BETWEEN THE DEPLOYMENT OF SUSTAINABLE OPERATIONS MANAGEMENT PRACTICES AND REGULATORY COMPLIANCE OF PEANUT BUTTER PROCESSING ESTABLISHMENTS IN ZAMBIA

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Abstract:-

Peanut butter processing companies are facing challenges in meeting food safety regulations leading to product recalls by the regulators. There is a claim in literature that sustainability can improve company performance, despite the lack of there being no empirical study to establish whether there is a relationship between deployment of sustainable operations management practices and the level of regulatory compliance for peanut butter processing establishments in Zambia. The research utilized a descriptive correlational research design, where a 5-point rating scale was used to collect quantitative data, in a face-to-face interview from n=12 managers. The collected data was analyzed in IBM SPSS Version 21 to obtain means, standard deviations, and Spearman's correlation coefficients. The descriptive study showed a 'low' to 'average' extent of deployment in product and process design, procurement, and quality management. The descriptive study further showed a 'low' to 'average' level of compliance of the peanut butter for most establishments. The overall results of the correlational study indicate that improving the extent of deployment of sustainable practices can spur improved level of compliance. It is recommended that managers invest in deploying sustainable practices to spur an improved level of compliance in the areas of procurement, quality and product and process design. Further research is needed to establish reasons for not deploying practices and include operations decision areas such as capacity and organizational structures in the research.

Keywords:- Sustainable Operations Management, Sustainability, Regulatory Compliance, Sustainable Practices, Company performance

I. INTRODUCTION

Peanut butter is a food product made from roasted groundnuts which are mechanically crushed into a paste (Zambia Bureau of Standards, 2008). It is a rich source of nutrition for children and the sick (Ansari et al., 2015). While eating peanut butter has many benefits, the product can be contaminated with Aflatoxins, bacteria such as Salmonella and it can also become rancid if kept for a long time, conditions which can have negative health effects on humans, (Hayden, 2017). Aflatoxins can cause cancer, diarrhoea, and vomiting, while Salmonella can cause diarrhoea, vomiting and the same symptoms can be caused by rancid peanut butter (Hayden, 2017).

In Zambia, the production and supply of peanut butter is regulated to protect consumers from consuming unsafe products (Zulu, 2016). The Zambia Bureau of Standards (ZABS) is one of the government agencies mandated to regulate the production and supply of the product (Abegaz, 2006). Processors are required to have a licence also called a permit-to-supply from ZABS upon meeting the regulatory requirements (Gondwe, 2018). The requirements include the technical requirements of the standard ZS 723:2008 (Zambia Bureau of Standards, 2008) and other administrative requirements.

The performance of peanut butter processing establishments with technical regulation has been poor as seen from studies and product recalls conducted by the regulator, Zambia Bureau of Standards (ZABS). Lyons peanut butter of Zimbabwe worth 350 000 Kwacha was recalled from the market by the ZABS, due to high aflatoxin levels in the product (Zulu, 2016). Njoroge et al (2015), found high levels of aflatoxins in locally produced peanut butter and imported peanut butter on the Zambian market. Banda, Likwa, Bwembya, Banda, & Mbewe (2018) also found high levels of the same toxins in locally produced and imported peanut butter on the Lusaka market. Failure to meet the requirements of technical regulation results in peanut butter being confiscated, or recalled from the market, and disposed of by regulators. The processors suffer increased operational costs due to the product recalls and they also suffer reputational costs. An example of a loss of reputation is that of a named processor in Lusaka who was sued by a customer for allegedly selling them contaminated peanut butter which caused them illness as reported by (Sakala, 2018).

There are claims by business leaders that sustainable practices and sustainable manufacturing helps in reducing regulatory burdens and in staying ahead of regulation. This is highlighted in the report by (OECD, 2011). It is also found that meeting the regulatory requirements is one of the drivers and motivation for deploying sustainable practices (Golini et al., 2017), (Firouzabadi et al., 2010) and (APICS, 2011). Empirical studies have been done to establish the relationship between sustainability and company performance e.g. (Eccles, Ioannou and Serafeim, 2014), (Aggarwal, 2013) (Chen, 2015) and (Hasan, 2012), which found a positive relationship between the two concepts. From the review of the literature, no study has been done to establish whether there is a relationship between deployment of sustainable operations management practices and the level of regulatory compliance. Further, no study has been done to establish whether there is a relationship between deployment of sustainable management practices in a specific operations decision area and the level of regulatory compliance. Without knowledge on which operation decision areas to invest in sustainable practices, operations managers might deploy costly practices that might not improve the current level of compliance.

Walker, Klassen, Seuring & Sarkis (2014) have defined sustainable operations management as the pursuit of social, economic, and environmental objectives within operations of a specific firm and operational linkages that extend beyond the firm to include the supply chain and communities. Gunasekaran, Irani & Papadopoulos (2014) define sustainable operations management as the operations strategies, tactics and techniques, and operational policies to support both economic and environmental objectives and goals, their definition excluded social goals. Sustainable operations management decisions can be classified into decisions concerning 'system design', and 'system operations', Firouzabadi, Olfat & Khodaverdi (2010). System design decisions concern product and process design, location planning and analysis, and capacity planning. System operations decisions are concerned with procurement, production, and logistics.

The aim of this study is to establish whether improving the extent of deployment of sustainable operations management practices in peanut butter processing establishments can spur an improved level of compliance. The findings of the study will be important for operations managers and the establishments to decide whether to deploy practices or not, and in which decision areas to deploy the practices.

II. LITERATURE REVIEW

2.2 Theoretical foundations

The study is founded on two theories, the stakeholder's theory, and corporate social responsibility theory. The stakeholder's theory's view is that organizations should consider all stakeholders as they make decisions to be sustainable. The corporate social responsibility theory is a means of taking into consideration the needs of all stakeholders in decision making.

2.2.1 Stakeholders Theory

Hickman & Akdere, 2017 presents that, under the stakeholders' theory, organizations should consider the interest of its stakeholders as it makes decisions as they are critical to the sustainability or long-term survival of the organizations. Stakeholder theory is a reconceptualization of the firm that seeks to change business culture from being focused solely on profit and loss to being focused on creating value for the various stakeholders that are affected by or can affect the firm. The traditional definition of a stakeholder is "any group or individual who can affect or is affected by the

achievement of the organization’s objectives” (Freeman, 1984). Freeman (2004) gives a more practical definition of stakeholders as “those groups who are vital to the survival and success of the corporation”. Practical in the sense that organization cannot take care of every stakeholder in practice, but it must prioritize.

Literature has identified several possible stakeholders of a company. Fontaine et al. (2006) identified stakeholders such as customers, employees, local communities, suppliers and distributors, shareholders, the public in general, business partners, future generations, past generations (founders of organizations). Friedman (2006) included more i.e. academics, competitors, NGOs or activists – considered individually, stakeholder representatives, stakeholder representatives such as trade unions or trade associations of suppliers or distributors, financiers other than stockholders (debt holders, bondholders, creditors), Government, regulators, policymakers. Stakeholder management is thought to be fulfilled by the managers of a firm, who should on one hand manage the interests of stockholders and on the other that of other stakeholders (Fontaine, Haarman, & Schmid, 2006). Therefore, in order to survive in the long-term, it is important that functional departments such as the operations department supports the organization in meeting the needs of key stakeholders such as regulators, customers and shareholders by implementing practices that ensure the needs of stakeholders are met.

2.2.2 Corporate Social Responsibility Theory

Corporate Social Responsibility (CSR) has generally been associated with companies making donations on issues of public concern such as education and fighting poverty. The social responsibility is presented as the consideration of the expectations of the stakeholders and the fact, for the company, of “answering” to the consequences of its decisions to these stakeholders (Fontaine et al., 2006).

There are two ways of implementing CSR according to literature and making donations is just one of the two. According to (Fontaine et al., 2006), it can through actions of patronage and sponsoring causes or by integrating into strategy through which try to implement the social and environmental dimension in the economic decisions: investments, conception of products or process of production. Fontaine et al. further say that the second method often has the objective of decreasing the risks and to improve the economic medium-term performances.

Sustainable operations management has been defined by different literature sources. Sustainable operations management is defined as the pursuit of social, economic and environmental objectives within the operations of a specific firm and operational linkages that extend beyond the firm to include the supply chain and communities (Walker, Klassen, Seuring, & Sarkis, 2014). In sustainable operations management, concerns of the operations function will stop being inward looking only to being outward looking as well, looking at the needs of other key stakeholders affected by the operations (Bettley and Burnley, 2008).

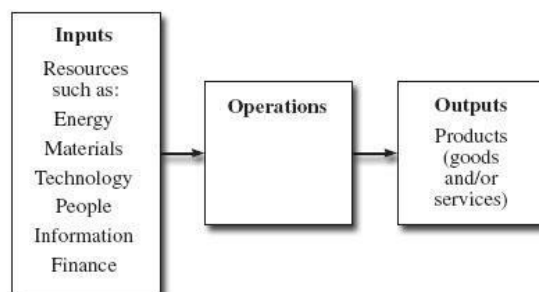


Figure 2. 1: Traditional Operations Model (ITO Model)

Source: Bettley and Burnley (2008)

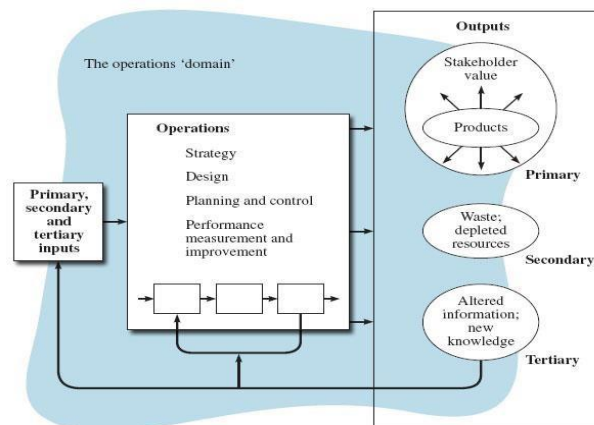


Figure 2. 2: The Expanded Transformation Model of Operations

Source: Bettley and Burnley (2008)

Gunasekaran, Irani and Papadopoulos (2014) defined sustainable operations management as the operations strategies, tactics and techniques, and operational policies to support both economic and environmental objectives and goals. Gunasekaran, Irani and Papadopoulos further say that operations should not only have cost reduction or economic interest as an objective but should also consider and protect the environment through reducing for instance the carbon footprint.

Like operations management decisions, sustainable operations management decisions can be classified into decisions concerning 'system design', and 'system operations. System design decisions include product and process design, location planning and analysis, and capacity planning. 'System operations' decisions include procurement, production (production planning, scheduling, and quality control) and logistics (Gunasekaran, Irani and Papadopoulos, 2014).



Figure 2. 3: Sustainable operations decisions areas

Source: Author (2018)

In sustainable operations management, environmental and social performance objectives, targets and indicators will need to be integrated with quality and cost and other conventional performance measures (Bettley and Burnley, 2008), i.e. the requirements of other stakeholders in addition to the customer must drive operations decisions. Different sustainable practices can be deployed in the operations decision areas to achieve sustainability goals.

2.2.3 Sustainable procurement practices

Sustainable procurement has been defined by different sources in literature. BCI (2012) defines sustainable procurement as an approach to purchasing products and services that considers the economic, environmental, and social impacts of an organization's buying choices, always. The ISO standard (ISO 20400:2017) defines sustainable procurement as the process of making purchasing decisions that meet an organization's needs for goods and services in a way that benefits not only the organization but society, while minimizing its impact on the environment. It can also be defined as the processes that businesses employ to purchase or receive goods that generate benefits to not only their bottom line, but also to society and the environment (Alberta Agricultural Forestry, 2017). Sustainably procured products are expected to have less safety concerns or other negative impacts on people and the planet and cost effective.

Several sustainable procurement practices have been identified in literature. Collaboration with supplier, supplier prequalification which allows for continuous improvement and an opportunity to share goals with suppliers and supplier development, specification of e.g. raw materials should include social and environmental specification (BCI, 2012). These are supposed to be practices that will lead to meeting social, economic, and environmental goals. ISO 20400:2017, a sustainable procurement standard also identifies some sustainable practices in procurement, the need to identify your suppliers, define how you will buy from them, and their level of risk i.e. social, economic, and environmental risks. Alberta Agricultural Forestry (2017) also identifies sustainable practices that can be deployed in procurement some which were also edified by BCI earlier, collaboration with suppliers, have code of conducts for suppliers, management commitment to sustainable procurement by coming up with policies, allocating resources for sustainability activities, evaluating and review suppliers performance on economic, social and environmental goals, identifying the suppliers, giving rewards to well performing suppliers. Alberta Agricultural Forestry brings out a very good point that there is need to identify a business case for implementing sustainable practices in procurement and then come up with the strategy. I agree that in doing so, it will enable the business to identify which practices to employ or not employ to meet the objectives of the business that is a targeted approach to deployments of the practices.

BCI (2012) and ISO (20400:2017), have identified benefits for implementing sustainable practices in procurement. It mitigates regulatory non-compliance, risk, and reputation (BCI, 2012). It influences performance, stakeholder relations and reputation of the company (ISO 20400:2017).

2.2.4 Sustainable inventory management practices

Literature on sustainable inventory management practices and their benefits is limited. According to Dashboard Stream Software (2016), some of the practices include using information technology to place orders, working with local vendors

and suppliers, using First In, First out (FIFO) inventory management approach, use of business analysis and forecasting tools.

The effective utilization of sustainable has many benefits. Using IT reduces manual work, working with local vendors and suppliers reduces transport costs, and time spent on the road, and gives the company ability to attend to stock issues, and the use FIFO approach reduces the amount of spoiled stock and forecasting tools help in understanding customer behavior (DashboardStream Software, 2016).

2.2.5 Sustainable practices in process technology choice

It is a well-known fact that the cost of the technology to be used in the manufacturer of products is the most important consideration when making a buying decision. Modak (2017) says that costs are given prime consideration as a selection criterion while meeting the required target of efficiency and yields. Meyer & Kiyamaz (2015) in their study to examine the impact of sustainability on capital investment decisions, found that the traditional financial measures, such as Net Present Values (NPV) or Internal Rates of Return are used for evaluation neglecting environmental considerations. However, when sustainability consideration is made in the buying decisions, social and environmental impacts need to be considered.

Some sustainable practices have been identified in literature that can be deployed in making process technology buying choices, which have been classified as either social, economic, or environmental practices depending on the goal of deploying the practice. Environmental consideration include the generation of waste and emissions which can be looked at as the cost of managing waste and emission generated by the technology, social considerations would include the ability to create local jobs, easy to operate, scale of technology, generation of noise, odor, safety concerns for operators, and instrumentation (Modak, 2017). According to Modak, this will give the true cost of the technology in the long run.

2.2.6 Sustainable practices in Facility location decisions

Facility location decision area is the other operations management decision area where sustainability considerations could be made. Facility location decisions concern the positioning of production facilities regarding international, national, regional, or local level (Dombrowki, Riechel and Doring, 2014). Further, according to Dombrowki, Riechel and Doring, these decisions are traditionally focused economic aspects, but environmental and social concerns should be put into consideration, a view shared by (Chen, Olhager and Tang, 2014).

Several sustainable practices have been identified in literature which can be deployed in making decisions on where to locate facilities. There is need to consider the air pollution of the location, the water quality, disease burden, and availability of waste treatment facilities in the location (Chen, Olhager and Tang, 2014). Chen, Olhager and Tang further suggest social practices such as general level of education of the people in the location, human rights issues and economic consideration are cost (Labor, Energy, material cost, facility costs and logistics), market, economic stability, and proximity to suppliers.

Chen, Olhager and Tang (2014) claim that making social, environmental, and economic considerations in deciding where to locate production facilities reduces risk. Nguyen and Olapiriyakul (2016) in their study of the impact of facility location decisions on local population's health conclude that there is need to strike a balance between the cost of the facility and human health impacts. Nguyen and Olapiriyakul findings seem to suggest a balance between the cost of the facility and compliance to regulation or other stakeholders' expectations such as consumers. This study will add to the gap in knowledge on whether the use of sustainable practices in making location decisions can spur improved compliance with food safety regulation.

2.2.7 Sustainable practices in product and process design

Process design has sustainability has sustainability implications the operations decision area has to do with the method of manufacturing. The process of manufacturing has different steps and these steps can have direct or indirectly influence the sustainability of the manufacturing process (Abdullahi & Abdullah, 2015). Literature is limited on the sustainable practices in process design. Abdullahi & Abdullah (2015) identifies low energy consumption, low environmental impacts in terms of waste generation, should have low negative impact on the personal health of operators and the community at large. Abdullahi & Abdullah seem to suggest the inclusion of social and environmental issues in choosing the steps to follow to produce a product or service.

Sustainability and sustainable practices in product design seem to have been discussed more in literature on sustainability in operations. There is need to consider cultural values of consumers e.g. Halal food for Arabian countries and Malaysia where this law (Abdullahi & Abdullah, 2015). Clark et al. (2009) and Valdes-Vasquez & Klotz (2013) suggests on stakeholder engagement in designing of sustainable products e.g. employees to be asked on how to better improve the products and regulators on the specifications to be met, local governments, users, and management considerations (risk control programs in place), impact assessments done. Valdes-Vasquez & Klotz further suggest the use of evidence-based design process, basing decisions on valid and reliable research.

2.2.8 Sustainable practices in quality management

To ensure long-term profitability, management attention should be directed in addition to profit, to respect legislation on social and environmental expectations for quality protection towards the responsibility for corporate accountability (Todorut, 2012). Todorut seems to be suggesting an extension of Total Quality Management (TQM).

Total Quality Management (TQM) has been defined by so many sources. It has been defined as a philosophy that focusses the firm on satisfying the customer by improving organizational processes to improve quality of products and services while meeting predetermined standards (Hickman & Akdere, 2017). Hashmi (2018), defines it as a description of the culture, attitude and organization of a company that strives to provide customers with products and services that satisfy their needs. Hashmi further gives characteristics of TQM. It requires quality in all aspects of the company operations, processes need to be done right the first time, and defects and waste should be eradicated from operations, all employees need to be involved in the continuous improvement of goods and services, and a need to have a processes view of the organization, processes which need to be improved. Its guiding principles include management commitment, employee empowerment, fact-based decision making, continuous improvement and customer focus (Hashmi, 2018).

How then can we make Total Quality Management (TQM) sustainable? Answering this will be key in understanding what sustainable quality management is, going by Todorut view that sustainability in quality management means increasing the scope of customers i.e. from the usual traditional customer to other stakeholders. Jasiulewicz-Kaczmarek (2014), introduced a term called sustainable quality management, to mean that the next stage of quality management will be different in that it will be more encompassing, by including more stakeholders than the traditional quality management which was focused more on customers than external stakeholders.

A brief history of the development of quality management given by Jasiulewicz-Kaczmarek gives some insight in the development of the new quality management. Quality management started with quality inspection after production, quality control which happens during production, then quality assurance before production, then TQM (before, during and after production) and then suggested sustainable quality management (SQM) which just extends the scope of TQM from customer focus to increasing scope of customers (regulators and their specifications, suppliers, customers). Total Quality Management which is informed by the stakeholder theory moves the focus of quality efforts from being narrow minded and internal process-focused to a more holistic and systems-oriented approach (Hickman & Akdere, 2017).

III. RESEARCH METHODOLOGY

The population of managers, operations managers $N=20$ was used and a sample size of $n=12$. Names and addresses of the establishments obtained were from ZABS data base. Convenience sampling was used a non-probability sampling method based on judgment (Sharma, 2017) It is also used when we limited with resources, time, and workforce (Etikan, 2016). It is cheaper and can be implemented quickly (Battaglia, 2008). Proximity of subjects was the motivation, for sampling Lusaka Managers. A face-to-face structured interview was used as the data collection method, which allows one to clarify more (Abawi, 2014) and have higher response rates.

The data collection tools used were interviewer (researcher)-administered sustainability and regulatory performance rating scales. It did not require the study population to be literate on the topic. The rating scales were prepared and tested for validity (Accuracy). (Construct validity checks on literature on SOMP's and Literature on regulatory requirements of ZABS and Predictive validity = 0.880243. Reliability (consistency) was tested using cronbach's $\alpha = 0.81476$ for sustainability and 0.81476 for regulatory performance scale.

A 29 Item, 5-point likert scale, sustainability rating scale, were the rating scale required the ratter to indicate on a scale of 1-5 the extent of deployment of a particular sustainable operations management practice e.g. the use of supplier code of practice in sourcing, where 1=very low, 2=low, 3=average, 4=high and 5=very high, was administered first followed by the 2 items, 5 point regulatory performance rating scale, were the ratter was to indicate on a scale of 1-5 the compliance levels e.g. compliance with technical requirements, where 1=very low, 2=low, 3=average, 4=high and 5=very high.

A cross sectional descriptive correlational research design was used. Informed by quantitative research methodology. Data was entered in IBM SPSS V.21 and means; standard deviations and Spearman's correlation coefficients were obtained using the SPSS.

IV.RESULTS

1. The extent of deployment of deployment of sustainable operations management practices in peanut butter companies

Regulatory requirements	N	Minimum	Maximum	Mean	Std. Deviation	Level of compliance
Product complies with chemical and microbiological requirements of ZS 723:2008	12	2.00	3.00	2.5000	.52223	Low-average
Factory complies with Codes of Practice – General Principles of Food Hygiene	12	2.00	3.00	2.7500	.45227	Average-high
Valid N (listwise)	12					

2. What is the current level of regulatory compliance of peanut butter processing establishments?

Decision Areas	N	Minimum	Maximum	Mean	Std. Deviation	Extent of deployment
quality practices	12	2.00	3.00	2.5167	.37618	Low-Average
Inventory management practices	12	3.00	3.80	3.4000	.24121	Average-high
facility location practices	12	2.75	4.00	3.3333	.38925	Average-high
Product & process design	12	2.57	3.71	3.1792	.32293	Low-Average
process technology	12	2.50	4.00	3.5833	.51493	Average-high
Procurement practices	12	2.00	3.00	2.5278	.28279	Low-Average
Valid N (listwise)	12					

Table 2: level of regulatory performance of processing establishments

3. What is the relationship between the extent of deployment of sustainable operations management practices and level of regulatory performance?

Table 3: The relationship between deployment of sustainable operations management practices and regulatory performance

Operational decision areas	Spearman's rho	P-value	Significance
Overall	0.841	0.01	*Significance strong positive overall relationship between deployment of SOMPs and regulatory compliance
System design	0.594	0.05	*Significance positive relationship between deployment of SOMPs and regulatory compliance
System operations	0.835	0.01	*Significant strong positive relationship between deployment of SOMPs in system operations and regulatory compliance
Product & process	0.841	0.01	*Significant strong positive relationship between deployment of SOMPs in procurement management and regulatory compliance
Facility location	0.006	Not significant	*No significant relationship between deployment of SOMPs in facility location decisions and regulatory compliance
Process technology	0.757	0.01	*Significant strong positive relationship between deployment of SOMPs in process technology choices and regulatory compliance
Procurement	0.696	0.01	*Significant strong positive relationship between deployment of SOMPs in procurement management and regulatory compliance
Quality management	0.629	0.05	*Significant strong positive relationship between deployment of SOMPs in quality management and regulatory compliance
Inventory	0.622	0.05	*Significant strong positive relationship between deployment of SOMPs in inventory management and regulatory compliance

V. DISCUSSION

The primary objective of the study was to determine the relationship between the extent of deployment of sustainable operations management practices and level of regulatory compliance. The secondary objectives were to determine the extent of deployment of sustainable practices, the level of regulatory compliance of the establishments and also determine the relationship between the extent of deployment of sustainable practices in a particular operations decision area and the level of regulatory compliance.

The descriptive study showed a 'low' to 'average' extent of deployment of sustainable practices in product and process design, procurement and quality management, and a 'average' to 'high' extent of deployment in inventory management, process technology choice and facility location decision. It was found that in procurement management, the performance of suppliers is not reviewed after being given a contract in terms of social and environmental performance, codes of conduct for suppliers are not developed, training of procurement personnel in best practices is not done and supplier pre-qualifications are not conducted. Quality management is not focussed on all stakeholders e.g. regulators are not incorporated through aligning product specifications with requirements of the regulator, there is lack of commitment by managers in deploying quality practices; training of personnel on quality management is not done. Further, managers do not use statistical tools for monitoring performance and there is a lack of a continuous improvement culture. Impact assessments are not done prior to development of processes and products. As a result, risk control programs are not implemented to ensure that the negative impacts of the products are minimized, risks such food safety risks. Valdes-Vasquez & Klotz (2013) suggests that a stakeholder analysis is done to ensure that risks are managed. The study found that the extent of deployment of sustainable operations management practices in inventory management, in facility location decisions, and in process technology decisions to be 'average' to 'high'.

From the descriptive study, it was found that the level of compliance of peanut butter with regulation for most establishments was 'low' to 'average'. This is consistent with the studies by (Njoroge et al., 2015) and (Banda et al., 2018). The level of compliance with the codes of practices for most organizations was found to be 'average' to 'high'.

The correlational study showed a significant positive relationship between the extent of deployment of sustainable operations management practices and the level of regulatory compliance. This means that the effective use of sustainable operations management practices can spur an improved level of regulatory compliance, the finding which is consistent with the findings of (Chen, 2015) and (Hasan, 2013). Alzawawi (2014), APICS (2011) cited the need to comply with regulation as the reason for and the business case for deploying sustainable practices in operations. The findings are also supported by the corporate sustainability theory (Freeman, 1984) and stakeholder theory (Fontaine et al., 2009).

Further, the correlational study showed a significant positive relationship between the extent of deployment of practices in system design decisions and the level of regulatory compliance. Further, the correlational analysis showed a positive correlation between the extent of deployment of practices in product and process design and in process technology decisions, and the level of compliance. Kiyamaz (2015) and (Modak, 2017) recommended that environmental costs and social costs need to be factored in when making capital expenditure decision such as the choice of process technology to buy. Abdullahi & Abdullah (2015) says that process design has sustainability implications which then ensure that the process has fewer negative impacts on communities. Deploying sustainable practices in product design ensure compliance with the law, Abdullahi & Abdullah (2015). There was no positive correlation between the extent of deployment of practices in facility location decisions and the level of compliance. Nguyen and Olapiriyakul (2016) found that deploying practices in facility location decisions can minimize risks including regulatory risks, which is inconsistent with the findings of the study. Nguyen and Olapiriyakul suggests that we need to strike a balance between economic motivations for choosing a location and social and environmental concerns.

The correlation study found a significant positive relationship between the extent of deployment of practices in system operations decisions and level of regulatory performance. Further, it shows that in system operations decision area, there was a positive correlation between the extent of deployment of practices and the level of compliance in procurement management, quality management and inventory management. According to the Business in the Community Ireland (2012), implementing sustainable practices in procurement has many benefits; it helps in risk management with the potential positive impact on corporate reputation and/or ability to mitigate any regulatory non-compliance. Sustainable procurement does just generate benefits for the company but society and the environment (Aleberta Agriculture and Forestry, 2017). This supports the findings of the study. Sustainable practices in inventory management reduce spoilage of raw materials and product (Dashboard Software, 2016). On quality management, the findings of the studies are consistent with, Hickmen and Akadere (2017) view that Total Quality Management informed by the stakeholder's view is likely to lead to a sustainable operation, one that will be able From the findings of the study, it can be recommended that managers need to deploy sustainable operations management practices to spur improved level of regulatory compliance. Managers should invest in deploying practices in procurement management, quality management and in product and process design where descriptive analysis results show that extent of deployment is 'poor' to 'average'. From the findings of the study, by putting into consideration the interest of its stakeholders, the companies can ensure its long-term sustainability. The establishments should put in the interest of key stakeholders in procurement of its needs, in quality management and in product and process design. It is important that managers safeguard the interests of key stakeholders as they manage the companies. The peanut butter processing establishments need to integrate social and environmental concerns in their business operations and integrate stakeholders' expectations in their operations practices, to meet the needs of key stakeholders such as regulators and customers.

VI. CONCLUSION AND RECOMMENDATION

The aim of the study was to establish if improving the extent of deployment of sustainable operations management practices can spur an improved level of compliance. The study has shown that improving the extent of deployment of sustainable operations management can spur an improved level of regulatory compliance. Therefore, managers need to invest in deploying practices in procurement, quality management, product, and process design where the descriptive study has shown that the deployment of practices is generally poor. With improved regulatory compliance, customers will be protected from the consuming unsafe peanut butter which can cause cancer, diarrhoea, fever, and abdominal pains. If implemented, the findings will help manage regulatory risk and reputational risk of the peanut butter establishments. The Deployment of sustainable operations management practices will also help improve operational performance through reduced product recalls. The findings of the research have implications for resource allocation for improving regulatory compliance, were managers will have to ensure that they provide resources in the procurement, quality management and in process and product design decision areas to improve compliance.

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