

Green Drivers and Green Manufacturing Practices Integration in Agro Processing Industry: Moderating Effect of Sustainability Orientation

William Gyasi-Mensah* Hu Xuhua
School of Finance and Economics, Jiangsu University, No. 301 Xuefu Rd.,
Zhenjiang, Jiangsu, P.R.C. 212013
E-mail of the corresponding author: gymmensah@yahoo.com

Abstract

Developing a balance between manufacturing and ecological preservation is considered a major issue in every society and so attention must be paid to this relationship to protect plant, animal and human lives. Pressure for manufacturing firms to become green has risen greatly. Green manufacturing has been encouraged, practiced and researched for years but mostly in developed nations, but low in developing countries. This is a follow up study on a previous one conducted by the authors on the direct effects of green drivers on green practices, and this current one aims at the moderating role of sustainability orientation on the effects of driving factors on green practices in Ghana. Analysis was done using structural equation modeling (SEM). Evidently, sustainability orientation (SUO) moderated significantly between driving factors and green design practices, green purchasing practices and green promotion/selling. Green design practices adoption was facilitated most by SUO. Green management practices and green logistics practices were not moderated by SUO. Outcomes of this work could serve as a guide towards decision making by industry actors and government of Ghana on policy formulation and better processes for integrating green practices, not just in the agro processing industry but all others with activities of possible damage to the environment.

Keywords: Green drivers, green practices, agro processing, sustainability orientation

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1. Introduction

Over the few recent years issues of environmental safety have become a subject of concern for policy makers and industry actors across the world. As result, manufacturing firms of all sizes across the globe and in all industries have been urged to apply initiatives that are friendly to the environment through adoption of certain practices. Adoption of green initiatives such as green manufacturing have gained enormous attention because, it is the expectation of policy makers it is one way minimizing or ending the dangerous effects of manufacturing activities while gaining benefits (Zhang and Fang, 2016). Of course as countries seek to industrialize, manufacturing cannot be underestimated for its benefits such as potential creation of employment and wealth (Thurner and Roud, 2016; Seth et al., 2018). Achieving any of these benefits can be challenging if policy makers and industry players fail to implement long term eco-friendly initiatives through methods such as green manufacturing (Wang and Sarkis, 2017; Moktadir et al., 2018). These approaches to green the manufacturing process can arise from activities aimed at resource reduction, minimizing waste and less generation of toxins into the environment. Aside the urge for firms to be environmentally sustainable while enjoying economic benefits, groups and organizations with interest in the environment have also been drawing attention for firms to be devoted towards eco-friendly approaches in their operations. Business enterprises of different sizes have recently facing compelling pressure from various stakeholders to integrate eco-friendly attitude in their businesses (Amankwah-Amoah and Syllias, 2019).

Green manufacturing is linked with the production processes that apply extensive eco-friendly materials and as well churn out higher products with minimized or no pollution from the manufacturing process (Baines et al. 2012; Dubey et al. 2015). Adoption of green manufacturing enables firms to reduce the consumption of raw materials, minimize energy consumption, minimize cost incurred from environmental and occupational hazards, as well as building a good corporate image in the eyes of the society (Porter and Van der Linde, 1995). Despite these advantages perceived to be gained from adopting and implementing green manufacturing practices, there are barriers that may hinder the smooth adoption and implementation of green phenomenon such as limited technology for implementing green manufacturing, insufficient funding for green adoption (Jabbour et al. 2016), resistance to change, reluctance to manufacturing disruption (Mittal et al. 2016). In the face of these benefits and challenges to adoption, it has become necessary to investigate what will drive firms to adopt the environmentally friendly methods of manufacturing especially in the developing world where many of these barriers are likely to be encountered. It is also necessary to ascertain the extent to which the orientation of firms on eco sustainability will affect its adoption and integration into their operations.

The impact of SMEs in the economy of Ghana cannot be underestimated as they create huge amount of jobs and minimize post-harvest losses (Baumann-Pauly, et al., 2013, Hamann et al. 2017). According to Ampadu-Ameyaw and Omari (2015), the agro processing industry performs a major function in through the creation of income and job opportunities in Ghana. The agro processing sub sector in Ghana comparatively exists as the sub sector of great importance in the manufacturing industry because they are in the middle of the agro food value chain, existing as a link between both producers and marketers in the industry.

Often times the environmental effects of manufacturing activities have been underrated especially among developing nations. However, since manufacturing has a direct effect on the environment, green the process cannot be underestimated and hence necessary. Whereas this issue of concern has been studied many time from developed and industrialized nation context, developing and less industrialized nations perspective is still new and under researched (Seth et al., 2016). Again, since many of studies on this subject have been in developed nations, applying their outcomes in developing nations like Ghana may be impossible. It is also not confirmed if these driving factors will drive firms to integrate green manufacturing practices fully or some other factors will facilitate this integration.

2. Review and Hypotheses

Among the motivations of a firm that uses conventional methods in its operation to develop and integrate eco-friendly methods in its processes is the awareness and commitment of management of the firm (Leonidou, et al, 2015). According to Christensen et al. (2014), the responsibility for developing aims, firm policies and organizational cultures that facilitate appropriate methods for adoption of eco-friendly practices lies on the managers or owners of the firm. In the opinion of Pinto and Allui (2016), driers that are internal to the firm exert higher effect on environmentally-friendly practices. Bahnot et al. (2017) supports this view with the assertion that, top management or owner commitment towards eco-friendly has been seen to be requirement without which integration of eco-friendly processes become a challenge. The critical importance of management or owner and staff commitment to green initiatives become even pronounced when their products are export oriented due to difference in political, legal and socio-cultural environments (Leonidou et al. 2015).

From the context of Resource-Base View (RBV), resources in relation with products are grounds for competitive edge for a firm (Barney, 2017). Modern definition puts it as the materials injected into the production processes such as skilled staff, know-how, financial capital, equipment and others (Kozlenkova et al. 2014). Firm resources may be considered as tangible such as equipment and financial capital or intangible such as experience and technical knowledge. These are inputs that enable the green agenda of the adopting firm (Lin and Wu, 2014). Theory suggests that, for resources to be well used in processes for success in the implementation of green practices to achieve its advantages, it ought not to be substitutable, not to be imitated, must be difficult to find and of high value (Vomberg et al. 2015, Cousins et al. 2019). In the opinion of (Leonidou et al.2016), firm resources play a vital role in environmental through for instance, making available a sound technological grounds to integrate environmentally friendly methods, finding new methods of green applications. Small enterprises mostly possess fewer resources, however those who have the few and use them strategically for ecologically friendly reasons, have a chance for high green performance (Klewitz and Hansen, 2014).

With the profiteering motive of every firm, the perceived benefit a firms expects to achieve from the integration of green practices motivates firms to adopt such practices. When a firms applies different methods to reduce waste, it is able to use less inputs for production, such as reducing packaging materials thereby, minimizing cost by the firm (Barzegar et al. (2018). Recycling of waste is one aspect of greening within en enterprise and this can help to cut down on excessive expenditure on new manufacturing inputs. Extant literature reveals that, a number of firms are not aware of the benefits of adopting green practices, such as saving on expenditure (Font et al. 2016; Yin et al., 2019), improved firm image (Park & Kim, 2014; Aripin et al. 2018), higher profits (Bonini and Swartz, 2014; Wiesner et al., 2018). Value addition to products has a way of bringing in returns to the firm as suggested in (Prieto - Sandoval et al. 2019). Value chain theory context asserts that, bodies in the value chain that contributors in the value addition process at different stages adds some value to the product before it gets to the consumer who pays a fee for it (Mwirigi et al., 2016). The works of Bossle et al., (2016) and del Mar Miras-Rodriguez et al. (2018) have shown that, cost savings is one of the motivators for which firms choose to integrate eco-friendly processes in their activities. Despite these driving factor, Gandhi et al., (2018) in their study asserted that, it is not in all cases that, adoption of eco-friendly practices among SMEs should be seen as being a drain on firms but as a responsible manufacturing strategy.

As far as firm's attitude relating to ecological initiatives is concerned, past literatures have expressed the impact of consumer awareness on firm's decisions (Weng, et al., 2015). The expectations of consumers from manufacturers have has come to be one of the drivers of environmental responsibility among firms (Hsu, et al., 2013). A lot of consumers have developed intensive awareness on the environmental responsibility by firms and that; choose to purchase eco-friendly goods (Vilchez et al., 2017). Whether firms have been moved to go green by the green product demands of consumers is something that has been studied in previous studies. Again, from the

context of supply chain past literature have shown that, regular pressure from players in the supply chain also coerce firms to become ecologically responsible supply chain initiatives (Wolf, 2013; Zhang et al. 2018). In order for firms to keep their customers, they are forced to pay attention to the feedbacks of their customers to gain. Their increased environmental concerns compel businesses to be eco-friendly in their business operations (Weng et al. 2015). Customers who purchase from overseas markets may require reliable signs such as ISO 14001 indicating the commitment of product manufacturers towards safe environment (Testa et al., 2018), thus affecting strategies of firms towards environmental protection.

Businesses do not operate in isolation and thus, operate with other competing firms in the same industry. When one firm adopts new environmental initiative, competitors are likely to feel pressured to re-assess their own processes concerning eco responsibility and conclude whether to make changes to their environmental initiatives (Marano and Kostova, 2016). In several business environments where businesses exist, there is some amount of pressure from competing companies in the industry that moves other businesses to accept and integrate eco-friendly practices with the aim of surviving in the industry (Ogunlela, 2018). Continuous influence from competitors force firms to implement environmentally safe initiatives such as eco-design not in the product design phase only, but also in their role as actors in the supply chain (Tamayo-Orbegozo et al. 2017).

From institutional theory context, the pressure from competitors on the firms to adopt certain green initiatives is referred to as mimetic (Tachizawa et al. 2015). This form of influence is seen at the times that enterprises imitate that activities of their competing enterprises when they observe them and realize the successes of those initiatives, they tend to copy these in order to gain positive image and survive in the industry (Govindan, 2018). To continue to enjoy advantages in the market, firms may resort to doing what competitors are doing and even better concerning environmental initiatives (Galeazzo and Klassen, 2015; Dangelico, 2016). Regulations regarding the environment and its adherence as a driving factor present some form of legal confines within which enterprises need to operate for environmental sustainability in their operations. Several researches have delved into the link between state regulations and environmental initiatives and have opined that, governmental pressure or influence through environmental regulations remains one major driver of green manufacturing initiatives adoption (Wolf, 2013; Dixon-Fowler et al. 2017). Regulations and its strict adherence by the state through agencies and bodies influence the activities of firms on environmental management (Hsu et al. 2013; Lin et al. 2014) and thereby stay in business. Again, to be competitive in the global market space, firms may have to adhere to both global and local regulations aimed at preserving the environment. From the context of institutional theory, the compulsion from regulations on firms to be environmentally responsible is referred to as coercive isomorphism aimed at making a firm engage in green initiatives. According to Thaib (2020), for a firm to adopt and integrate environmental management initiatives, such as eco-design, reverse logistics and others, it requires some amount of coercive pressure. In the opinion of Wang et al. (2019), the extent to which regulations are enforced in industrialized nations erupt some level of institutional pressure for enterprises in developing countries towards improving their responsible practices towards the environment. In the nutshell, support from the state and compliance to regulations is seen to influence greatly the policies and implementation of environmentally benign initiatives (Singh et al., 2014; He et al., 2016).

Sustainability orientation (SUO) refers to the overall proactive strategic stance of small firms towards the integration of natural environmental concerns in their business operations. Firms with higher levels of SUO are likely to have institutionalized in its overall strategy, structure, processes and activities a wide range of measures designed to either reduce the firm's negative impact on the natural environment or to positively contribute to environmental protection, preservation or re-generation. Recently, sustainability researchers have demonstrated that a firm's sustainability orientation is deeply rooted in values and beliefs that provide behavioural norms that trigger or shape its sustainability activities and, thus, enhance employee behaviours in new product development activities (Claudy et al. 2016; Varadarjan 2017). It may be described as intrinsic values and ethical standards of company commitment towards environmental protection (Chen et al. 2015). Sustainability orientation accordingly has an impact on the integration of the new product design and processes into the organizational structure (Klewitz and Hansen, 2014).

Moreover, sustainability orientation positively affects the practices included in firm's sustainability strategies (Kirchoff, et al., 2016) and actively influences firm behaviour in practice (Johnson, 2015). Sustainability orientation is typically reflected on the redesign of firms' products and production processes through green adoption according to the environmental and social regulations that ultimately generate competitive advantage (Aikenhead et al., 2015). The business enterprise is perceived to possess enormous degree of orientation and commitment towards environmental responsibility when they decide to implement ecologically safe manufacturing activities motivated by an enterprise-wide feeling of responsibility and accountability for the potential effect of the activities of the business enterprise on the environment (Roxas et al. 2017). Considered as a firm-level strategic orientation, sustainability orientation ought to be ingrained in the grand business philosophy of the business and become part of the overall strategic configurations which directs the business or operational plans, programs and practices of the firm (Carroll, 1979). Through several ways, firms demonstrate their sustainability orientation, such as pollution prevention or minimization (Kraus et al. 2018), investment in eco-

friendly technologies (Torkkeli et al. 2017). A study posits that adoption of green activities in an organization differs between large and small firms given the difference in their characteristics (Tyler et al. 2018). Therefore, the current research seeks to investigate how sustainability orientation mediates or facilitate the adoption of green manufacturing initiatives among small and medium agro processing firms in Ghanaian business environment. We propose that:

H1a: Sustainability orientation significantly moderates the adoption of: Green management practices

H1b: Sustainability orientation significantly moderates the adoption of: Green design practices

H1c: Sustainability orientation significantly moderates the adoption of: Green purchasing practices

H1d: Sustainability orientation significantly moderates the adoption of: Green promotion/selling

H1e: Sustainability orientation significantly moderates the adoption of: Green logistics practices.

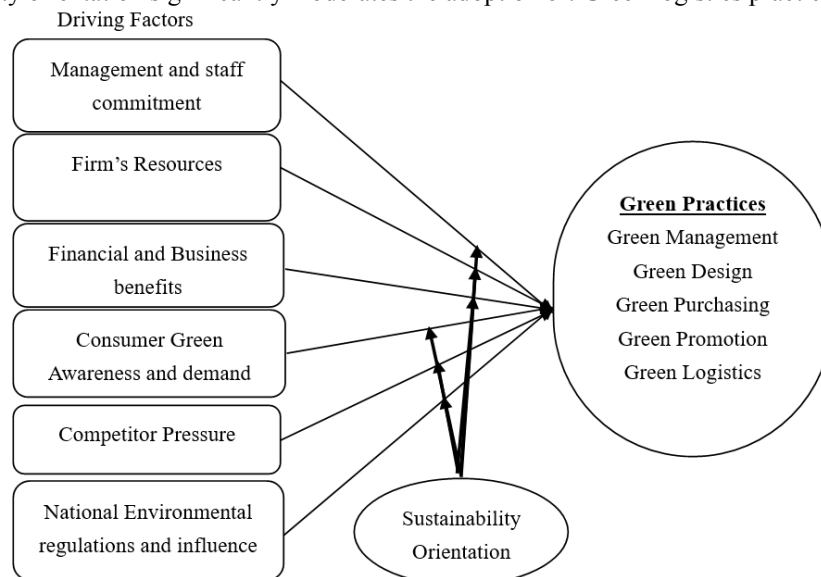


Figure 1. The research framework

3. Methods

3.1 Sample choice and characteristics

The agro processing sector of the manufacturing industry was chosen as the population. The reasons as assigned are two folds. Firstly, few studies have been conducted on other industries and sectors such as green orientation, customer based brand equity and competitive advantage in Ghana (Amegbe and Hanu, 2016), reverse logistics practices in Ghana's pharmaceutical industry (Kwarteng et al. 2014), but less attention has been paid to the agro processing industry which is a major contributor to Ghana's economy. Secondly, this industry is mostly dominated by small and medium enterprises on which this investigation is based, thus making it the appropriate choice of industry for this study.

3.2 Instrument design

In order to solicit the responses of our sample size firms, a survey was conducted using a set of questionnaire to investigate the proposed framework. Premised on review of past studies, the researcher designed a structured questionnaire with seven constructs to measure how the sampled firms find sustainability orientation to moderate or facilitate between the driving factors and their adoption of green manufacturing initiatives. With the aim of getting more precise data from respondents in this study, a pilot study was conducted among 50 SMEs observe the understanding of the concept, as well as to notice any ambiguities and suggest improvements to the survey questions. A close look at the feedback resulted in reassessment and finally the set of questionnaire was developed. The various constructs were measured on a five-point likert scale (1=strongly disagree to 5=strongly agree).

3.3 Data collection

This study was premised on green manufacturing practices and the factors that drive its adoption among agro processing SMEs in Ghana. Targeted respondents to the set questionnaire were manufacturing managers or supervisors of sampled firms. The reason is that, they are personnel in these firms who are seen to be closer to the processes involved in the production process and likely to be privy to any new initiatives implemented in the manufacturing process. One peculiar feature of SMEs is that, they are usually owned and managed by one or two people who make all decisions concerning the firm (Wiltshire Committee, 1971) and have thorough knowledge of the firm's practices and strategies. To avoid ambiguity in our results, a pre-test exercise comprising 60 firms was

carried out to assess first-hand the relationship between our independent and dependent constructs. No discrepancies of high magnitude were observed at the 0.05 significance level after all questionnaires were received; hence biases in responses were not seen as obstacle. To encourage committed participation, the researchers presented green manufacturing branded souvenirs to each respondent. Also, respondents were given the fullest assurance of their responses being used for research purposes only. In all 415 SMEs in Eastern, Greater Accra and Ashanti territories of Ghana were the locations for sampling because they shared similar features of our target firms.

3.4 Analysis approach

This study is a follow up study to the work of Gyasi-Mensah and Hu (2019) and so a similar analysis approach was adopted, using structural equation modelling with AMOS 24.0 to test the moderating effect of sustainable orientation. All procedures in Gyasi-Mensah and Hu (2019) were followed and then the mediating effect of sustainability orientation was also analyzed. In addition to the approach followed in the initial study in which the relationship between independent variables comprising MSC, FBB, FRS, CAD, CIP and NEI with their constructs were analyzed as first order factors (ee1-ee22), with dependent variables comprising GMP, GDP, GPP, GPS and GLP as second order factors (ee23-ee40), the moderating variable represented by sustainable orientation which is denoted by 'SUO' in the subsequent parts of this study, and its' effect was also analyzed. Together they measured the relationship among the latent variables as seen in the research framework.

4. Results

4.1 Descriptive statistics

Table 1. Descriptive statistics showing category, frequency and percentages of descriptive items

Number	Variable	Category	Frequency	Percent (%)
1	Years of Operation (N=415)	<10	108	26.0%
		10 - 20	174	41.9%
		>20	133	32.0%
2	Environmental management body registration Status(N=415)	Registered	275	66.3%
		Unregistered	140	33.7%
3	Environmental management unit (N=415)	Have	279	67.2%
		Do not Have	136	32.8%
4	Environmental management policy (N=415)	Have	263	63.4%
		Do not Have	152	36.6%

Table 1 above expresses the description and characteristics of the various samples that were used in this study in relation to their environmental responsibility and management.

In Table 2, the outcome of factor analysis is presented. Reliability and validity of data used in this study were obtained using Cronbach alpha and average variance extracted (AVE) respectively. The figures representing all individual models recorded above 0.7, indicating a firm and approved reliability for the scale used, in consonance with the techniques of Hair Jr. et al., (2014). On validity, the results showed that all figures of AVE were greater than the standard value of 0.5, hence making all variables valid for analysis (Hair et al. (2014).

Table 2. Factor analysis of construct items, factor loadings, AVE and Cronbach's alpha values for variables

Variable	Factor Loading	AVE	Cronbach's Alpha
Management and Staff's GM Commitment (MSC)			
MSC1	0.860	0.682	0.840
MSC2	0.816		
MSC3	0.716		
MSC4	0.639		
Financial and Business Benefits (FBB)			
FBB1	0.754	0.646	0.724
FBB2	0.651		
FBB3	0.651		
Firm's Resources (FRS)			
FRS1	0.803	0.667	0.749
FRS2	0.680		
FRS3	0.644		
Consumer awareness and demand (CAD)			
CAD1	0.749	0.550	0.781
CAD2	0.699		

Variable	Factor Loading	AVE	Cronbach's Alpha
CAD3	0.686		
CAD4	0.589		
CAD5	0.582		
Competitor influence or pressure (CIP)			
CIP1	0.815	0.679	0.761
CIP2	0.714		
CIP3	0.634		
National environmental regulations and Civil Society Groups' influence (NEI)			
NEI1	0.755	0.585	0.763
NEI2	0.695		
NEI3	0.659		
NEI4	0.562		
Green Management (GMP)			
GMP1	0.632	0.505	0.772
GMP2	0.577		
GMP3	0.569		
GMP4	0.554		
Green Design Practices (GDP)			
GDP1	0.853	0.588	0.767
GDP2	0.677		
GDP3	0.586		
GDP4	0.568		
Green Purchasing (GPP)			
GPP1	0.762	0.599	0.788
GPP2	0.634		
GPP3	0.506		
Green Promotion/Selling			
GPS1	0.871	0.650	0.811
GPS2	0.803		
GPS3	0.790		
Green Logistics Practices (GLP)			
GLP1	0.811	0.637	0.810
GLP2	0.637		
GLP3	0.628		
GLP4	0.593		

4.2 Analysis

Table 3. Results of moderating effect of sustainability orientation on green practices

Path of influence			Estimate	S.E.	C.R.	P	Supported
GMP	<---	SUO	0.051	0.066	0.77	0.442	No
GDP	<---	SUO	0.15	0.068	2.226	0.026	Yes
GPP	<---	SUO	0.115	0.055	2.1	0.036	Yes
GPS	<---	SUO	0.091	0.042	2.182	0.029	Yes
GLP	<---	SUO	0.094	0.08	1.173	0.241	No

It is worth reminding that, this study is a follow up study to Gyasi-Mensah and Hu (2019) and for that matter, there may be reference to that study when necessary. Therefore in this analysis, results on the non significant direct relationship between driving factors and green practices adoption only will be compared after introducing the moderation variable of SUO. In reference to our previous work (Gyasi-Mensah and Hu, 2019), we realized that, the direct relationship between the drivers and green practices had statistically non significant p values as follows (MSC-->GMP, 0.548), (CAD-->GMP, 0.848) and (FRS--> GMP, 0.949). The rest being FBB, CIP and NEI had statistically significant relationship with GMP. From table 2, it was observed that, SUO had a statistically non significant relationship with green management practices which from now will be represented by GMP with p-value of 0.442 at 0.05 significant levels. This implies that, the moderating effect of GMP between the non significant independent variable and the green practices could not be validated, hence H1a was not supported.

The direct relationship between FRS-->GDP and CAD-->GDP were statistically non significant with p-values of 0.708 and 0.497 respectively. The remaining drivers all recorded statistically significant relationships with GDP.

The statistically significant connection between SUO and green design practices (denoted by GDP) was seen to be statistically significant with p-value of 0.026 at 0.05 significant levels. This validated the significant moderating role of SUO. Hence, our hypothesis 1b was supported.

On the part of GPP, the direct correlation between MSC-->GPP, FRS-->GPP, CAD-->GPP, CIP-->GPP were all statistically non significant with p-values of 0.076, 0.407, 0.197 and 0.19 respectively. All other driving factors had a significant relationship with GPP. A statistically significant relation existed between SUO and GPP with 0.036 at 0.05 significant levels, thereby suggesting a significant moderating role of SUO towards adoption of GPP. Thus, H1c was supported.

Concerning GPS and the independent variables from direct relationship context, we observed that, there was statistically non significant relationship between MSC-->GPS, FRS-->GPS, CAD-->GPS and NEI-->GPS with p-values of 0.282, 0.913, 0.611 and 0.213 respectively. On the other hand, FBB and CIP had significant relationship with GPS. Our results showed a significant correlation between SUO and GPS with a p-value of 0.029 at 0.05 significant levels, thus showing that, a firm's SUO will improve adoption of green promotion practice, when driven by especially the factors with non significant relationship. Thus H1d was supported.

From our results, it was realized that directly, the relationship between the driving factors and GLP, that is, MSC-->GLP, FRS-->GLP, and CAD --> GLP were not significant statistically as they recorded p-values of 0.109, 0.074 and 0.43 respectively at 0.05 significance levels. However, FBB, CIP and NEI statistically correlated significantly with GLP at 0.05 significance levels. From table 2 above, it evident that the moderating relationship between SUO and GLP was statistically non significant with p-value of 0.241 at 0.05 significance levels, thus invalidating a possible capacity to improve the effect of the independent variable factors on GLP and its integration in the agro processing industry. This implies H1e failed to be supported.

4.3 Discussion

This study exhibits that sustainability orientation generally has effect on the acceptance and integration in the business operations of SMEs in the agro processing industry in Ghana. The present study widens the discussion and for that matter literature on the drivers of eco friendly manufacturing and green practices adoption, especially in the developing world. We developed a framework to test the mediating effect of sustainability orientation on green practices within agro processing SMEs in Ghana. Having summarized the results of the direct effect of green drivers on green practices adoption as in Gyasi-Mensah and Hu (2019), we proceed to discuss the moderating role of sustainability orientation between green drivers and green practices.

The findings in this study shows that SUO could not establish a good relationship between green driving factors and green practices. However, this assertion contradicts the findings of Kirchoff et al. (2016) who found a positive relationship between SUO and green management. Again, the study of Yu and Huo (2019) shows that, sustainability orientation has a significant impact, and thus facilitates green management practices especially in relations to supplier. The reason for this disagreement between the current and previous studies could be that, most of these firms are driven by external factors directly than by internal factors (Gyasi-Mensah and Hu, 2019).

Our results showed that there exist a positive relationship between SUO and green design practice. In other words, with a strong SUO, firms are greatly driven toward green design practices in the SME industry. This is consistent with the findings of Shashi, Cerchione, Centobelli and Shabani (2018) who suggested that, SUO will lead to green or sustainable design in SMEs. It is again supported by the findings of Feng et al. (2018) which concluded that, internal and external sustainability orientation positively affects the green product and process developments which are offshoots of green design practices. Thus, the moderating effect of SUO between drivers and green practices is validated.

The outcome of this study which is supported by a dataset comprising 415 Ghanaian SMEs, expressed that, SUO is very vital phenomenon towards the green practices of the agro processing industry, specifically green purchasing. In congruence with the findings of Shashi et al. (2018), our findings posit that SUO will highly lead to green purchasing among SMEs in the industry under consideration in this study. Therefore, it is necessary for SUO to be encouraged in the industry for improved green effect. Our results are also in consonance with the findings of Ghosh (2019) which posited that, firms that pay attention to environmental concerns or have environmental orientation are very well leaned towards green purchasing practices in their operations.

On the green promotion/selling practice, sometimes referred to green marketing, our results found a favourable relationship between SUO and GPS, thus confirming a significant moderating role for SUO. Our findings are supported by previous work of Joshi and Rahman (2019). Their work expressed that environmental concerns was a major driver of green purchasing of products in SMEs. Alabdali (2019) considered the change in senior management's stance towards implementing green initiatives as an emergence of orientation on greening the product marketing process and thus posits that, the manager or supervisor's SUO affects GPS implementation. However, this is in disagreement with the findings of Adawiyah (2018) who found that environmental consciousness does not have significant impact on effective GPS in SMEs, in that government in Indonesia fails to pressurize firms to be ecologically responsible.

Green logistics as well as reverse logistics form an integral part of green supply chain and for that matter considered in many studies from the context of green supply chain. The findings of Chu (2016) indicated that, internal and external sustainability orientation had a positive relationship with green supply chain (logistics). Again Marshall et al. (2015) described sustainability orientation as sustainability culture and asserted a positive relationship between sustainability culture (SUO) and green supply chain practice. However, our findings showed that SUO could not significantly relate with green logistics practices. In other words, the moderating effect of SUO in this study could not be validated. A possible reason could be the lack of enforced regulations and the absence of penalty or punishments when firms ignore the negative footprints of products on the environment throughout the supply or distribution process.

5. Conclusion

Green practices integration in business operations are seen as a major boost towards environmental preservation. By implementing these initiatives within forms and the industry as a whole, manufacturing SMEs can reduce their negative impacts on the environment, whilst reaping the accompanying benefits. The motive of manufacturing firms is to meet the demands of their consumers while making profit, but their effect on society cannot be ignored. It is for this reason that, studies are continuously being conducted on how their activities can be made as sustainable as possible and this study is no exception. This study has extended the debate on what among many other factors will be necessary for SMEs to go green through adoption of certain practices. It has presented and verified the specific green practices among those being applied in this study whose adoption is well moderated by sustainability orientation. In effect, the researchers believe that, further research may be required to further ascertain why the other practices could not be mediated by sustainability orientation.

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