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An investigation into sustainable product packaging practices and performance in the pharmaceutical industry in Ghana

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Abstract

Given the growing concern for businesses to give adequate attention to green issues, and the lack of empirical research on this area in the country, it became necessary that this present study examine the extent to which the pharmaceutical industry in Ghana adheres to sustainable product packaging practices, the benefits that accrue to such initiatives and also the challenges that the industry faces in pursuing this course. The study relied on data collected using questionnaires from 36 employees of 4 locally-based manufacturers, 6 distributors, 16 retailers, and 5 health facilities operating within the Ashanti Region. Statistical tools like the descriptive and inferential procedures were employed in analyzing data collected. The outcome of the study points out that, the parties in the industry were found to make efforts in adhering to general environmental standards as well as standards relating to effective product packaging in their supply chains (SCs). Notwithstanding, the study finds out that coordination and collaboration efforts relating to sustainable product packaging is less manifest between manufacturers and downstream members in the industry. Given these findings, it was recommended that stakeholders in the country effectively collaborate to promote sustainable product packaging.

Keywords: Sustainability, Packaging, Supply Chain, Pharmaceutical Industry

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1. Introduction

Sustainability is a hot global issue and has been a topic of interest over the years. This international focus has led to the enactment of a regulatory guidance. These measures have been developed with sustainable dimension product and service assurance, process validation, and regulatory compliance. It has therefore become a critical factor in the design of healthcare facilities, equipment, products, and packaging of pharmaceutical products. It is not surprising to identify the growth of discourse of sustainability in packaging especially across and between governments, industry, universities, and regulatory bodies (Path, 2011).

The continuing depletion of the environment and deteriorating of environmental quality has been met with a global agenda and drive towards green environment. As a result, national bodies and standard control authorities are constantly implementing policies and laws to be able to fight environmental pollution and resource destruction. The World Health Organization (2003) reports that when the term pharmaceutical packaging is applied as a collective unit, it constitute the knowledge, art and know-how of shielding products for allotment, storage, transaction and use which includes written materials used in the final product. The Pharmaceutical industry constitute a critical area that produces all manner of waste emanating from liquid, gaseous, semi -solid and to solid waste. Industrial packaging is done to keep the life span of most of the drugs and other related medicines produced. Through packaging, the life span of the pharmaceutical products is elongated and as well do not compromise the health of people who patronize such pharmaceutical products.

The materials used in the packaging of pharmaceutical substances together with the containers serving as preservers are mostly harmful to the environment. Unfortunately, since most industries do not track the end user medium of disposal of these products on the supply chain continuum, there is nothing being done about how these packages when disposed affect the sustainability and eco friendliness of the environment. Little or scanty research in Ghana specifically examine Pharmaceutical industries' compliance in tracking how the packaged products are finally disposed. More to this problem, the issue of how the pharmaceutical companies manage their waste generated during packaging in their production process is scanty in terms of research.

The study of Saghir (2004) proposed the following definition of packaging in logistics: "The process of planning, implementing and controlling the coordinated packaging system of preparing goods for safe, secure, efficient and effective handling, transport, distribution, storage, retailing, consumption and recovery, reuse or disposal and related information combined with maximizing consumer value, sales and hence profit.". The key fact in this definition is that packaging in logistics should be seen as an incorporated strategy, with the packaging systems together interacting, adapting and complementing each other to achieve the desired results.

The use of efficient and effective reusable materials for environmental sustainability is therefore crucial to meet the sustainable goals that Ghana and the world in general seek to achieve (Singh et al., 2011). The statistics in Ghana with regards to sustainable packaging and the market share of pharmaceutical companies is quite weak unlike the advanced nations where market research companies have established data collection system at critical points of sales outlets. The growth rate of the Ghanaian pharmaceutical industry

is estimated at between 6% to 8% and with a total market of about $250 million USD in the year 2005 (Grupper et al., 2005).

The main objective of this study is to investigate sustainable product packaging practices and performance of the pharmaceutical industry in Ghana. The specific objectives are;

1. To investigate into environmental sustainability awareness and compliances in the pharmaceutical industry in Ghana.
2. To examine sustainable product packaging policies and practices within the pharmaceutical industry in Ghana.
3. To assess the benefits and challenges of sustainable product packaging in the pharmaceutical industry in Ghana.

2. Materials and methods

The descriptive cross sectional design was adopted in this study. This is justified on the basis of the nature of the study and the extent of involvement for the various Pharmaceutical industries. The research approach was both qualitative and quantitative. Data together were sought from the primary and secondary sources. Primary information refers to all data obtained from the field through the use of questionnaires, observation and interview guide. Secondary data refers to data from books, journals, reports, newspapers and internet among others. Table 1 shows the summary of data collection and Table 2 shows the Demographic background of the downstream channel members.

Table 1. Summary of data collected

Target respondent		Sample size	Response rate	
Manufacturer (4 firms)	Management	4	4	100.0%
	Employees	40	36	90.0%
Wholesalers/distributors		10	6	60.0%
Retailers		20	16	80.0%
Health facility		5	5	100.0%
TOTAL		79	67	84.8%

Table 2. Demographic background of the downstream channel members

		Count	Percent
Stage in the downstream SC	Retailer	16	59.3%
	Distributor/Wholesaler	6	22.2%
	Health facility	5	18.5%
Number of years in operation	Less than 1	1	3.7%
	1 to 3	8	29.6%
	4 to 5	5	18.5%
	More than 5	13	48.1%

These formed the theoretical and conceptual basis of the research. The main tools that were used in collecting the primary data were questionnaires. Questionnaires were designed to have both open and close ended questions and were used when a wide range of responses was solicited for or anticipated. The aim here is to maintain the originality and intensity of responses. With respect to data analysis, both quantitative and qualitative techniques were used. The results of the research were analyzed using the Statistical Packages for Social Sciences (SPSS). Thus, whiles quantitative data was analyzed descriptively, the thematic analysis formed the basis for analyzing the qualitative data.

The study employed the case study and a survey. The case study research strategy is appropriate since it involves empirical investigation into a particular situation or phenomenon within an organization. (Cooper and Schindler, 2000) The study adopted the multiple case studies. Yin (2003, p.1) asserts that case studies are the favored approach designed to answer "when 'how' and 'why' questions that are being posed and when the focus is on a contemporary phenomenon within some real-life context". A case study strategy is important to gain the rich view of the study and its processes (Eisenhardt and Graebner, 2007).

A multiple case study approach was adequate for this study to investigate 'how" various Pharmaceutical companies have adopted sustainable product packaging. This study used a mixed method research process to determine the level of compliance of these manufacturing pharmaceutical companies for sustainable product packaging in the industry. (Saunders, 2012)

The survey was used to complement the multiple case studies. A survey uses deductive research approach used to often answer 'what', 'who', 'where', 'how much', and 'how many' questions. Survey adopting questionnaire are popular for the compilation of consistent data from a considerable population in an extremely inexpensive means which allow for easy evaluation.

The study employed both qualitative and quantitative approaches. According to Blaxter et al. (1996: 61) quantitative approach is an approach where the compilation and scrutiny of data is in numeric form which often have the tendency to be carried out on a larger scale with sets of representative data that are presented and perceived as being about the gathering of facts. Qualitative research approach primarily focuses the gathering and analyzing data in many methods, which are mostly non-numeric or subjective in nature. This approach tend to focus on smaller numbers but with a focus to explore to gain an 'in-depth rather than breadth' (Blaxter et al., 1996).

Questionnaire was the main data collection tool for the primary data. The data were collected from the following stages within the industry's supply chain:MANUFACTURER LEVEL– (from MANAGEMENT & EMPLOYEES), andDOWNSTREAM Portion also constituted - (WHOLESALERS/DISTRIBUTORS, RETAILERS, HEALTH FACILITIES).

In summary, these were the category of the various respondents:

- 10 employees each × 4 pharmaceutical companies = 40 responses,
- 1 management member × 4 pharmaceutical companies = 4 responses
- For distributors or wholesalers down the supply chain = 10 responses
- Number of retailers= 20 responses
- Clinics or health facilities who are end users = 5 responses.

- Hence our total sample size or expected responses is (40+4+10+20+5) =79 responses.

3. Results

Data for the study were collected from two broad stages within the pharmaceutical supply chain, that is, at the manufacturer stage and the downstream portion. At the manufacturer stage, four manufacturers who operate within the Ashanti Region were considered. For each firm, data were collected from management and employees using questionnaires respectively.

At the downstream portion, data were collected from distributors or wholesalers, retailers, and health facilities using questionnaires. Given the time frame for the field study, an overall response rate attained was 84.8%. The non-response rate attained was due to failure of some respondents to provide response on time. For instance, the wholesalers or distributors had a low response rate of 60% because 6 out of the 10 respondent who are wholesalers or distributors failed to administer their questionnaire for data analysis. This was a limitation or a challenge to the study. The management level notwithstanding this had a 100% response rate with all the 4 respondents fully partaking in the study.

3.1. Employees' awareness and knowledge on sustainability practices

Further, in order to know the knowledge and awareness that the employees have on the issues being investigated into in the study, data were accordingly collected. Per the results shown in Table 3, less than half of them (30.6%, n=36) have had education/training on sustainable issues in the industry in which they work. Out of this, 54.5% (n=11) had assistance from their current firm to undertake such training while 27.3% (n=11) provided funds for the training themselves. Their responses also reveal that such training/education was mostly formal.

Table 3. Extent of training & education for employees on sustainable issues

		Count	Percent
Education and training on sustainable issues?	No	25	69.4%
	Yes	11	30.6%
Source of fund/assistance for the training	Myself	3	27.3%
	My current firm	6	54.5%
	My previous employer	2	18.2%
	Others	0	0.0%
Form of training/education	Very informal	0	0.0%
	Informal	2	18.2%
	Semi-formal	0	0.0%
	Formal	4	36.4%
	Very formal	5	45.5%

Also, the responses summarized in Table 4 indicate that, an average respondent is quite aware on environmental issues in the industry (M=3.47, SD=.845, n=36) and the average respondent also understands that the kind of materials that the industry relies on in packaging its product has direct effect on the environment (M=4.09, SD=1.004, n=36). Further, for employees who have had training/education on environmental issues perceive that such training/education has brought a larger benefit to their organizations.

Table 4. Awareness and benefits of training employees on sustainable to firms

	N	Mean	Std. Dev.
1. Awareness of environmental friendliness[1]	36	3.47	.845
2. Impact of packaging on the environment[2]	36	5.08	1.826
3. Benefit of the training/education[3]	11	4.09	1.044

[1] measured as 1=not at all, 3=aware, 5=very much aware

[2] measured as 1=strongly disagree, 4=indifferent, 7=strongly agree

[3] measured as 1=not at all, 3=to a large extent, 5=to a much larger extent

3.2. Adherence to sustainability standards and nature of policies and practices at the industry level

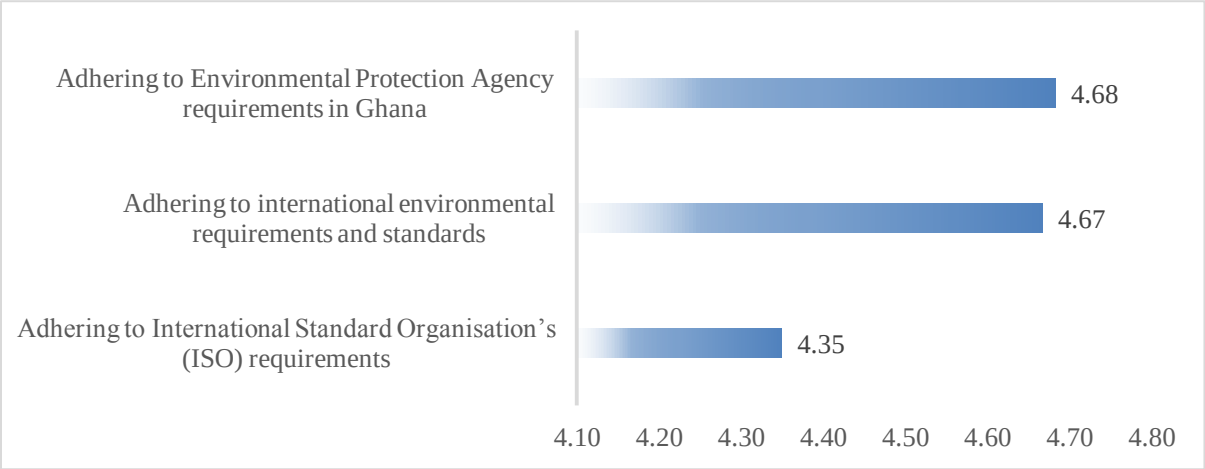
Although, theoretically, this study is limited to product packaging, the researcher believes that, effective product packaging activities carried out by firms or industries would be contingent on the kind of and the extent to which the operators adhere to general environmental standards as well as the policies and practices put in place. Accordingly, data were collected at the manufacturer level as well as at the industry level. The data on the manufacturer level were collected from the management of the firms while that for the industry level were collected from employees and the downstream channel members. This section focuses on analyzing the data collected at the industry level. The subsequent sections also present analysis at the manufacturer level.

At the industry level, the respondents (employees and downstream channel members) were asked to evaluate the industry in general with respect to these concerns. A 7 point scale which measured from 1=strongly disagree through to 4=indifferent/not sure to 7=strongly agree, was employed for this evaluation measured. The responses gathered are discussed and presented as follows:

3.3. Adherence to standards at the industry level

Per the results shown in Figure 1, it can be seen that an average respondent 'somehow' perceives that the pharmaceutical industry adheres to general environmental standards set by the Environmental Protection Agency (EPA–Ghana) (M=4.68), international environmental requirements and standards (M=4.67), and international standard organization (ISO) (M=4.35), given that the mean scores were a little above the cut-off point of 4.00, which measures a state of indifference in the respondent's responses. However, given that the

mean scores were very far from 7.00, it can be said that the respondents generally perceive the industry is not doing that much in adhering to the sustainability standards.



N=63; Scale: 1=strongly disagree, 4=neither agree nor disagree, 7=strongly agree

Figure 1. Industry's adherence of standards

3.4. Policies and practices at the industry level

Referring to the results in Figure 2, the respondents to some extent agree that, the industry generally makes efforts to minimize the negative effects of its operations on the environment (M=5.08). Notwithstanding this, the means scores obtained on other issues indicate that the respondents somehow perceives that the industry does not do much well in coming out with policies that are in line with environmental requirements (M=4.81), using packaging materials that have less negative effects on the environment (M=4.79), encouraging channel members to manage product package materials effectively (M=4.79), aligning & interest that maximize benefits derived from product packaging, and supporting and encouraging channel members to be environmental (M=4.95).

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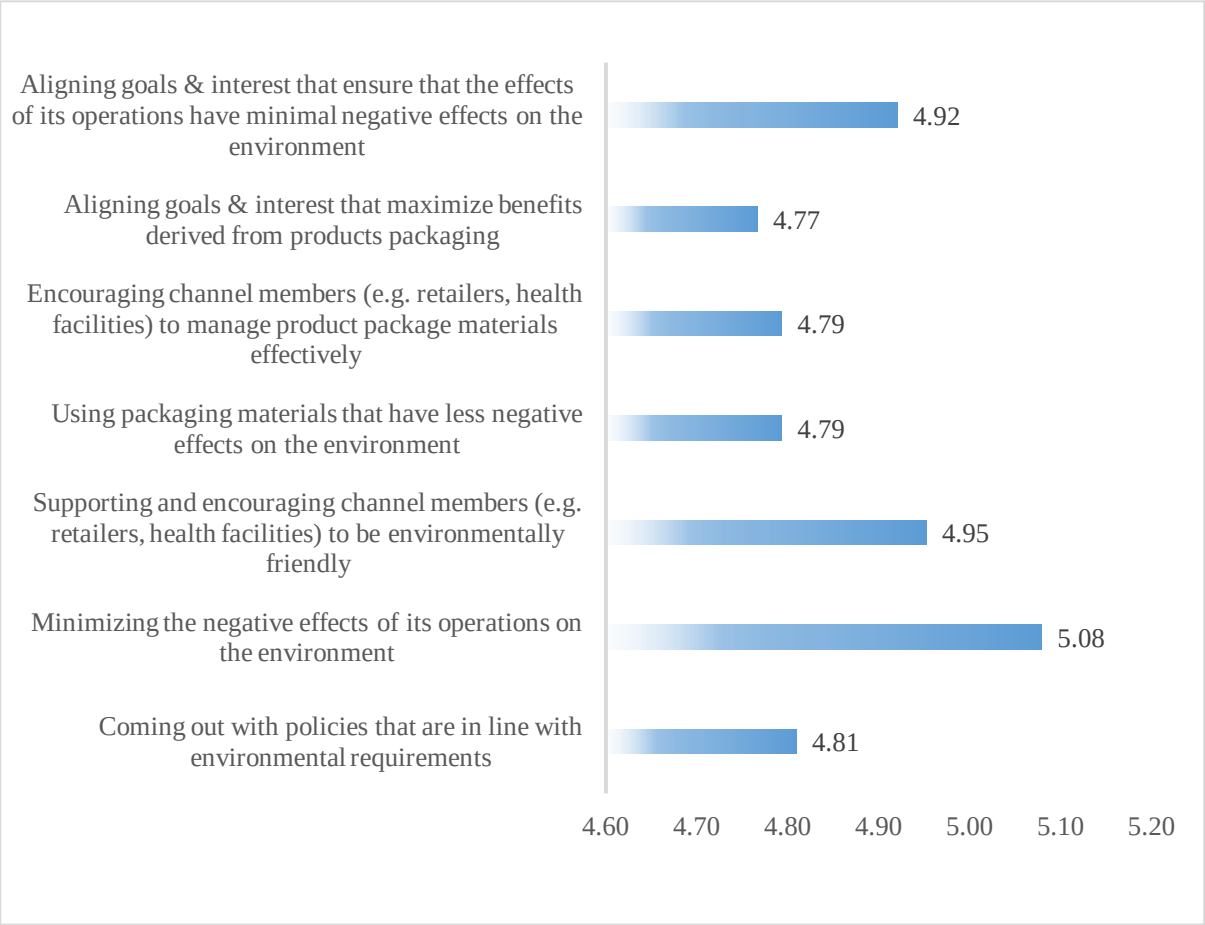


N=63; Scale: 1=strongly disagree, 4=neither agree nor disagree, 7=strongly agree

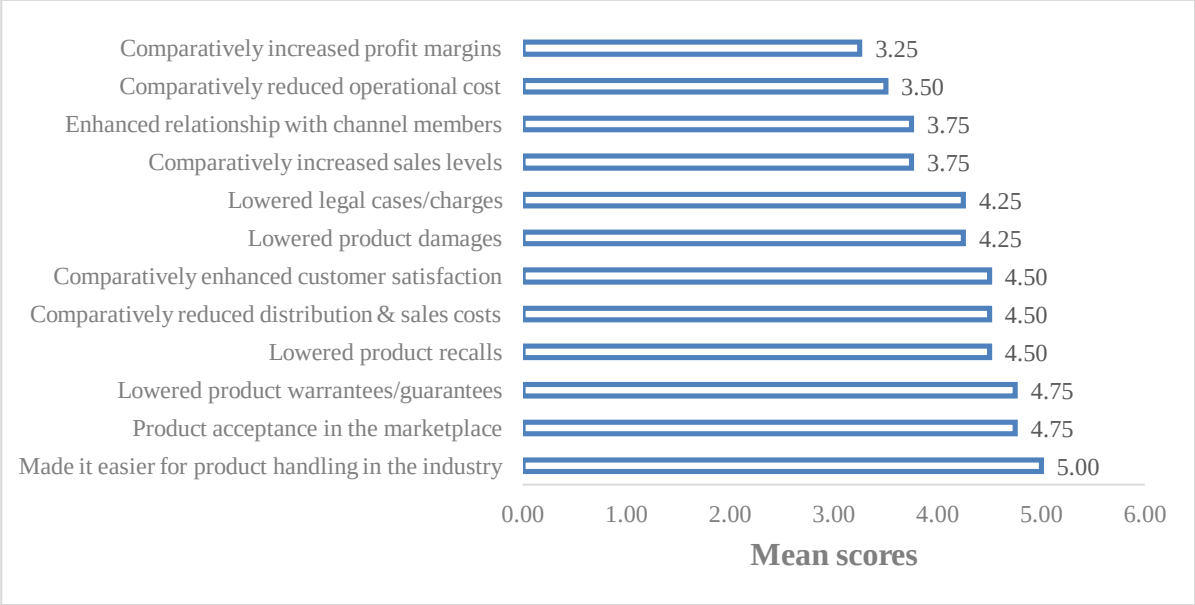
Figure 2. Industry's sustainability policy and practices

3.5. Benefits of sustainable product packaging to manufacturers

From economic perspective, SPA (2002) points out those firms could benefit when they engage in sustainable product packaging. Accordingly, the researcher was interested in evaluating the perceived benefits that manufacturers in the industry have gained over the years by engaging in sustainable product packaging. This assessment was done by employing 12 items. 5-point scale was adopted for this assessment. The scale measured from 1=not at all, 2=somehow, 3=to some extent, 4=to a large extent, to 5=to a larger extent. The result of this assessment is shown in Figure 3 and 4.

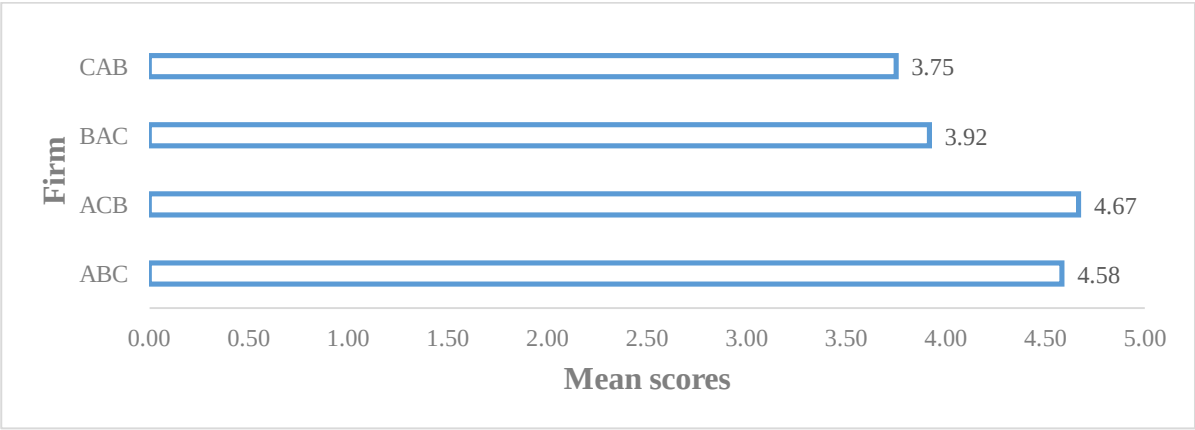
The results shown in Figure 3 generally revealed that an average firm who participated in the study is largely believed that its efforts and adherence to sustainable product packaging in the industry has improved product handling (M=5.00), increased product acceptance in the market (M=4.75), lowered product warrantees (M=4.75), lowered product recalls (M=4.50), comparatively reduced distribution & sales costs (4.50), and enhanced customer satisfaction (M=4.50). In comparison to the above results, the firms believe

that sustainable product packaging practices have not adequately contributed to increasing profit margins (M=3.25), reduction in operational cost (M=3.50), enhancing relationship with channel members (M=3.75), and increasing sales levels (M=3.75).



Scale: 1=not at all, 2=somehow, 3=to some extent, 4=to a large extent, 5=to larger extent

Figure 3. Extent to which sustainable product packaging has benefited manufacturers



Scale: 1=not at all, 2=somehow, 3=to some extent, 4=to a large extent, 5=to larger extent

Figure 4. Extent to which sustainable product packaging has benefited firms

Notwithstanding the differences in the area of benefits perceived to be associated with practicing sustainable product packaging, it is still seen that the least mean score is above 3.00 for each item, which still

indicates that the firms believe that being environmentally concerned in packaging products can improved firm performance in diverse ways.

3.6. Challenges of sustainable product packaging to manufacturers

With respect to factors that constrain the firms' sustainable product practices, it was revealed by most of them that, it is more costly to implement sustainable product packaging practices. To them, cost of building recycling plants is high in the industry. Elsewhere, Zweep (2009) indicates that, cost is a huge reason for which a company may not want to stray from going green in the operations. Further, it was also revealed that there is no adequate collaboration in recovery of product packaging materials in the industry.

4. Discussion and conclusions

This study set out to investigate sustainable product packaging practices and performance in the pharmaceutical industry in Ghana. Data required to address this objective were collected using questionnaires from members in the industry's supply chain. Data gathered and the relevant analyses performed revealed that the industry to some extent embraces sustainable product packaging practices and perceives that such efforts at both the manufacturer level and industry level have had some positive impacts on the firms' performance as well as minimizing the negative effects of their operations on the environment and consumers.

The first specific objective of the study was to investigate the extent to which stakeholders in the pharmaceutical industry are aware of and adhere to environmental sustainability standards. Responses from employees at the manufacturer-level revealed that awareness and knowledge on environmental issues and how firms' operations in the industry can threaten sustainability is much acknowledged.

Data collected at the industry level indicated that adherence to standards set by national and international environmental bodies are moderately complied with. The responses summarized earlier in the discussion with regards to the awareness of environmental sustainability issues indicated that, an average respondents are quite aware on environmental issues in the industry and the average respondent also understands that the kind of materials that the industry relies on in packaging its product has direct effect on the environment.

At the manufacturer level also, it was found that none of the case firms who participated in the study is currently certified by the International Standard Organization (ISO). Notwithstanding this, the firms indicated that they adequately adhere to standards set by the Environmental Protection Agency of Ghana and that their operations are regularly monitored and assessed by the Agency in a close collaboration.

Per the results as earlier discussed it was noted that an average respondent 'somehow' perceives that the pharmaceutical companies adhere to general environmental standards set by the Environmental Protection Agency, International environmental requirements and standards and international standard organization (ISO). It can be said that the respondents generally perceive the industry is not doing that much in adhering to the sustainability standards.

As put by Anne Johnson, Director of the Sustainable Packaging Coalition in the webinar," Sustainability in Packaging: A Deeper Shade of Green" convened on December 16, 2010 concluded that sustainable packaging should be a corporate initiative rather than regulation or consumer driven which according to her is unlikely to happen.

4.1. Sustainable product packaging policies and practices within the pharmaceutical industry in Ghana

Secondly, the study sought to examine sustainable product packaging policies and practices within the pharmaceutical industry in Ghana. Findings of the study indicated that at the manufacturer level, firms have policies regulating their operations as well as on how they package their products so that it would not have huge negative impacts on the environment. However, the study revealed that such product packaging policies are mostly communicated at the firm-level and also to suppliers and not to other channel members at the downstream portion of their supply chain.

Additionally, the study revealed that most manufacturers engage in continuous improvement by constantly identifying better ways of packaging their products. In so doing, their search has focused on making materials used for packaging the industry's products more bio-degradable, easy to be recovered, recycled, and reused. It was also found that some of the firms constantly make efforts to reduce the volume of materials used for packaging products.

At the industry level however, responses collected indicated that there is inadequate effort to support and encourage other channel members and to align goals and interest that seek to maximize benefits derived from product packaging. In a related sense, the study found that little training and development is given to employees on environmental and sustainable product packaging issues.

4.2. Benefits and challenges of sustainable product packaging in the pharmaceutical industry in Ghana

Lastly, the study also found out that manufacturers in the industry level largely associate their adherence to sustainable product packaging standards and practices implemented with improved product handling, increased product acceptance in the market, lowered product warrantees, lowered product recalls, comparatively reduced distribution & sales costs, and enhanced customer satisfaction.

Notwithstanding the benefits perceived to be derived from sustainable product packaging, the study also indicates that it is more costly to implement sustainable product packaging practices. For example, to some of them, cost of building recycling plants is high in the industry. Further, it was also revealed that there is no adequate collaboration in recovery of product packaging materials in the industry.

In conclusion, Ghana which is one of the few countries in the sub-Saharan part of Africa has gotten the best institutions and the best laws when it comes to the protection of the environment but the lack of political will and dysfunctional laws and regulations for the protection and preservation of the environment

has bewildered such efforts to even meet the targets of the Millennium Development goals (7 and 8) which are set to expire in 2015 (Environmental Protection Agency, 2015).

There should always be a close collaboration along the supply chain from the manufacturer level down to the consumer or customer level to ensure the alignment of goals since as the name 'chain' implies the break in any part of the 'chain' is tantamount to the failure of the total supply chain because each network or member of the supply chain does not function in silo but coordinate to ensure the satisfaction of customer needs whiles safeguarding the environment as well (Chopra et al., 2007).

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