
The Role of Carbon Accountant in Corporate Carbon Management Systems: A Holistic Approach

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Abstract: Carbon accounting consists of a combination of advanced cost allocation techniques such as activity-based management and life-cycle costing; that improve the identification and assignments of carbon-related expenses and overheads to such objects as products, services, customers and organizational processes. The study therefore sets out to find the role of carbon accountant in corporate management systems. Data used for this investigation were collected from primary and secondary sources. Primary data are first-hand information from respondents while Secondary data include textbook, Annual Reports and financial statements and internet facilities. The study employed descriptive survey and ex-post facto research design and the formulated hypotheses were tested by use of T-Test and OLS Regression. Based on the analysis and the hypothesis tested, it showed that there is a statistically significant relationship between carbon accounting and corporate performance of selected quoted Manufacturing Companies and based on this findings, it was recommended amongst others that, adaptation to conditions that include long-term changing dynamics of the natural environment should be encouraged and the focus of finance and accounting system should not only cover short-term outcomes and management of short-term costing, reporting and disclosure but also long-term climate risks.

Keywords: accountant, accounting, carbon, carbon accounting, manufacturing, Nigeria Stock Exchange.

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Introduction

There is growing unequivocal scientific evidence on the effects of human activity in general, and of Green House Gas (GHG) emissions in particular, on global warming that would worsen the already deteriorating ecological environment (IPCC, 2012); (Gunardi et al., 2016); (Rokhmawati et al., 2017). The 5th Assessment Report of the IPCC clearly stated that human interference with the climate system is occurring, and climate change poses severe risks for human and natural systems. The atmosphere and ocean have markedly warmed since the 1950s, the amounts of ice and snow have diminished, sea level has risen, and the concentrations of

greenhouse gases have increased (IPCC, 2014); (Rokhmawati & Gunardi, 2017). The negative impact of climate change on economy, social activities and people's health has already been emerging and the trend toward a low carbon economy has been beginning. Evidence points to the need to respond to the threats posed by climate change across businesses, industry and society (Linnenluecke & Griffiths, 2010); (Surminski, 2013), and to adapt to those changes that will occur even if GHG emissions were stopped immediately (Linnenluecke et al., 2015).

Corporate carbon reduction initiatives and emissions reporting have expanded rapidly across firms, particularly as a response to institutional demands and value creation considerations. Regulatory and market-driven changes are expected to have a major impact across a wide variety of industries (Tang & Luo, 2014). The Kyoto Protocol was the original international regulatory response to global warming, under which more than 150 countries agreed to strive to decrease carbon dioxide (CO₂) emissions (Ratnatunga & Balachandran, 2009).

Aside from mandatory compliance, firms need to cope with rising investor demands for transparent and credible exposure to carbon levels and associated abatement costs (PricewaterhouseCoopers, 2009) and incorporate the assets, liabilities and risks associated with managing GHG emissions into traditional accounting, governance and control mechanisms (CIMA, 2010); (Hartmann et al., 2013). The carbon footprint concept has emerged to measure the impact (measured in CO₂-equivalent) that a product, service or organization has on climate change (Finkbeiner, 2009); (Boguski, 2010); (Munasinghe, 2010).

Interest of accounting scholars on carbon emission and climate change initiatives is traceable to the discipline's longstanding interest in environmental reporting (Stechemesser & Guenther, 2012). Climate change and the need to reduce GHG emissions is an extremely broad issue, touching almost all aspects of human life and values (Hoffman, 2011a); (Hoffman, 2011b), and requires that millions of individuals and organizations change their production procedure, consumption patterns and life style (Levy & Egan, 2003); (Giddens, 2009). A few of the recommended carbon-reduction methods for business including changing light bulbs to low emission, switching off lights at quitting time, letting employees work close to home, and buying green power. A report by the Business Roundtable on Climate Change in Australia found that early action by companies to reduce CO₂ emissions would add the equivalent of US\$1.8 trillion to gross domestic product (GDP) by 2050 and create more than 250,000 jobs (Weekes, 2007). To achieve this goal will require the efforts of the entire society, and accountants and auditors are expected to position themselves as managers of carbon control and implementation of climate change strategy (Lovell & MacKenzie, 2011). Against this backdrop, this study investigates the role of carbon accountant in corporate carbon management systems.

Despite scientific warnings that climate change will have a significant impact on climate-exposed sectors such as water, agriculture, forestry, health and tourism (Hoffmann et al., 2009); (IPCC, 2012); (Linnenluecke et al., 2013), the corporate world has been slow to react, possibly due to lack of legislative guidance and formal changes to risk assessment, governance and disclosure requirements (Linnenluecke et al., 2015). Though, there is anecdotal evidence that suggests an increasing effort to incorporate carbon accounting into traditional decision and reporting processes (Hartmann et al., 2013), research with a carbon accounting focus is lacking. Corporate practice with collecting, managing and communicating corporate carbon related information is under researched (Kolk et al., 2008); (Hopwood, 2009); (Lohmann, 2009).

Studies have addressed the impact of global warming, carbon market and carbon regulations on corporate accounting practices (IETA, 2007); (Bebbington & Larrinaga-González, 2008); (Cook, 2009); (CIMA, 2010); (Hartmann et al., 2013). Authors address issues such as the market effects of carbon emissions (Chapple et al., 2013); (Matsumura et al., 2014); (Romi, 2014), carbon assurance and auditing (Simnett et al., 2009); (Olson, 2010); (McKinnon, 2010), carbon cost accounting and carbon management accounting (Ratnatunga, 2007); (Ratnatunga, 2008); (Ratnatunga & Balachandran, 2009); (Ratnatunga et al., 2011), carbon disclosure (Reid & Toffel, 2009), etc. in a study by He et al. (2013), they observed that voluntary carbon disclosure is a

rational choice that firms make to reduce the pressure exerted by legitimacy threats and to lower the cost of capital.

Previously, companies focused on adapting to short-term changing business conditions (including technological and legislative changes and changes in competitors and market demand), because finance and accounting systems are set up to focus on short-term outcomes and the management of short-term costing, reporting and disclosure, rather than on longer-term climate risks (Linnenluecke et al., 2015). As a result, considerably lesser attention been paid to adaptation to conditions that include long-term changing dynamics of the natural environment (Linnenluecke et al., 2013).

There is currently, scarcity of studies on the concept of carbon accounting in developing countries. More so there is a dearth of knowledge (Ratnatunga & Balachandran, 2009) and scant evidence on efforts required and expended by accountants in this regard (Hartmann et al., 2013). As noted by Young (2010), GHG accounting is a huge challenge to accountants and accounting academics. Accountants have viewed their role as largely technical and nonstrategic (Lovell & MacKenzie, 2011). Although attention directed to carbon issues in companies is on the increase, the amount of actual research conducted on information management practices in regard to carbon issues in companies to date remains limited (Okereke, 2007); (Jeswani et al., 2008). They study by (Matsumura et al., 2014) indicate that the markets penalize firms for their carbon emissions, but a further penalty is imposed on firms that do not disclose emissions information. This study is therefore set out to examine the role carbon accountants play in a corporate carbon management system.

The main objective of this study is to examine the role of carbon accountants play in a corporate carbon management system. The specific objectives of the study are to: 1) examine the awareness and extent of disclosure of carbon related information by manufacturing firms, 2) identify the role of accountants in setting-up a corporate carbon management system in manufacturing firms, and 3) investigate the relationship between corporate carbon emissions and disclosure and corporate financial performance of manufacturing firms.

This study would be beneficial to: 1) Accountants: Accountants are key providers of information for decision-support in organizations; creating carbon information by means of accounting techniques and systems enables managers to gain a relative advantage in performing their managerial tasks and attaining the corporate objectives (Zvezdov & Schaltegger, 2015). This study therefore highlights the role accountants need to play in this climate change era by considering measurements and strategies outside of conventional paradigms. 2) Businesses: Companies will increasingly and inevitably have to address climate change adaptation as an integral aspect of their business strategy and risk management (West & Brereton, 2013). Because failure to manage the impacts of climate change can expose organizations to considerable risk: infrastructure and supply chains are adversely impacted due to climate and weather extremes with resulting financial impacts, business models and their limits are exposed (e.g. insurance companies and investment funds facing changing risk profiles), and reputational, legal and regulatory obligations arise (Linnenluecke et al., 2015). The findings therefore would be of interest to corporate top management who are interested in improving corporate carbon emission reduction, reporting and management strategy. More so, this study contributes to the understanding of how social concerns for climate change affect corporate financial performance. 3) Contribution to Literature: This study also contributes to sustainability literature, with a particular focus on corporate carbon accounting and disclosure by providing an overview of the process.

This study focuses on Carbon Accountants and their role in Corporate Carbon Management Systems in Nigeria. The study focuses on manufacturing companies, with a particular emphasis on Brewery and Beverage firms quoted on the Nigerian Stock Exchange (NSE) in Nigeria. The study covers a period of six years, from 2011-2016 financial year. The Carbon Accounting considered in this study are Community involvement, Research and Development, and other environmental and social disclosures as seen in the study.

Methods

The focus of this study is on manufacturing companies listed on the Nigerian Stock Exchange (NSE). Manufacturing sector was chosen because it remains the most powerful engine for economic structure of countries (Jide, 2010). The quoted manufacturing companies are classified under several sectors, such as: Agriculture; Conglomerates; Construction/Real Estates; Consumer goods; ICT, and Industrial Goods. The selected companies are shown in Table 1.

Table 1 List of Selected Companies for the Study

A. G. Leventis	Dangote Sugar	Flour Mills of Nigeria	Nestle Nig Plc.
Ashaka Cem	Transcorp	GSK	Nigerian Breweries
Beta Glass	Arbico Plc	Guinness Nigeria Plc	SCOA
Cadbury Nigeria Plc	Berger Paints Nig Plc	Honeywell Flour Mills	UACN
CAP Plc	Pz Cussons	Julius Berger	Vitafoam
Chams	Champion Breweries	John Holt	Unilever Nig Plc
Chellarams Plc	Dangote Flour Mills	Livestock Feeds	Union Dicon Salt
Dangote Cement	First Aluminium Nig Plc.	Neimeth Int. Pharm.	7-Up Bottling Coy. Plc.
Nasco Plc.	UTC Nig. Plc.	International Brew. Plc.	Nig. Enamelware Plc.
Ps Mandrides Plc.	Premier Paints Plc.	May and Baker Nig. Plc.	Multi-Trex Intgrt. Prdt.

Source: NSE Fact Book (2016)

Dependent variable

Return on Equity (ROE): this is a profitability ratio, measured as net profit/equity. The return on equity ratio or ROE is a profitability ratio that measures the ability of a firm to generate profits from its shareholders' investments in the company.

Independent variables

Environmental and Social Disclosure (ESD): In measuring the corporate environmental disclosure, the study employed content analysis technique. This is a research technique for the objective, systematic and qualitative description of the manifest content of communication. It is clearly defined by as a method of coding the text or the content of a piece of writing into various groups or categories based on selected criteria. Smith (2003) describes content analysis as a technique employed to derive meaningful inferences from texts in a document based on a predetermined set of criteria. That content analysis is rigorously developed, widely used and a very useful method of measuring environmental disclosure is well documented in the literature (Beck et al., 2010).

Control Variable

Control variables are related to the target variables though, are not primary variable of interest the inclusion of a control variable(s) is meant to remove its (their) effect(s) from the study's model. This study has

added firm size as a control variable. Firm Size (FMS): Firm size is proxy with the logarithm of the Total Assets of the company for the financial year.

The data for the study were derived from primary and secondary sources; the primary data is derived from a structured questionnaire (see Appendix). The secondary data is obtained from annual financial statements of the selected companies.

A mean of 3.0 was used as decision thresh-hold in answering the research questions while the Sample Mean T-test was use in testing the formulated hypothesis. For the secondary data, the Ordinary Least-Squares (OLS) regression model was employed. It is a generalized linear modelling technique that may be used to model a single response variable which has been recorded on at least an interval scale. The technique may be applied to single or multiple explanatory variables and also categorical explanatory variables that have been appropriately coded (Hutcheson, 2011).

$$\text{TESD} = (\text{CI, EH\&S, CG, R\&D, OREI})$$

Where:

CI = Community Involvement

EH\&S = Employee Health and Safety

CG = Corporate Governance

R\&D = Research and Development

OREI = Other Related Environmental Information

$$\text{ROE (t)} = \alpha + \text{TESD (t)} + \text{FMS (t)} + \mu$$

Where:

ROE = Return on Equity

TESD = Total Environmental and social disclosure

FMS = Firm Size

α = Constant

μ = error term, technically known as the stochastic disturbance or stochastic error term.

Results and Discussion

Table 2 shows that 29 respondents are females (i.e. 33.7%), while 51 persons were males (i.e. 59.3%). Table 3 showed that 20 respondents (i.e. 23.3%) have between 0 to 5 years in service, 3 respondents (i.e. 3.5%) have 6 to 10 years in service, 5 respondents (i.e. 5.8%) have 11 to 15 years in service while 52 respondents (i.e. 60.5%) have 16 years in service and above. This is an indication that a good percentage of respondents have stayed long on the job making easy to give a valid opinion on the subject matter. Table 4 shows that 45 respondents (i.e. 52.3%) are in the mid-level management while 35 respondents (40.7%) are senior managers.

Cronbach's alpha was employed in checking for reliability of the instrument, section B showed α value of 0.764 (see Table 5) and section C showed α value of 0.703 (see Table 6), both were greater than a generally accepted threshold of 0.70. Thus, the measurement is reliable.

The Cronbach's alpha on the test of measurement reliability scale for role played by accountants in setting-up a corporate carbon management system in manufacturing firms showed an alpha level of 0.703 which is above the generally accepted threshold of 0.70. Thus, the measurement is reliable.

Table 2 Gender of Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	29	33.7	36.3	36.3
	Male	51	59.3	63.7	100.0
	Total	80	93.0	100.0	
Missing	System	6	7.0		
Total		86	100.0		

Table 3 Years of Work Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5	20	23.3	25.0	25.0
	6-10	3	3.5	3.8	28.7
	11-15	5	5.8	6.3	35.0
	16-Above	52	60.5	65.0	100.0
	Total	80	93.0	100.0	
Missing	System	6	7.0		
Total		86	100.0		

Table 4 Management Level of Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Staff Management	45	52.3	56.3	56.3
	Top Level (Line) Management	35	40.7	43.8	100.0
	Total	80	93.0	100.0	
Missing	System	6	7.0		
Total		86	100.0		

Table 7 showed the acceptance remark for all statements in response to investigative questions on the extent of manufacturing firm's awareness and disclose of carbon related information and a grand mean of 4.99 which is above the decision threshold of 3.0. Table 8 showed the t-test result to determine manufacturing firm's awareness and disclosure of carbon related information. Our analysis revealed a statistically significant result as shown in the above were ($t = 395$, $N = 80$ and $p = 0.000$) thus we reject the null hypotheses and conclude that Manufacturing firms are aware and disclose carbon related information.

Table 5 Cronbach Alpha Values for Section B of Structured Questionnaire

Cronbach's Alpha	N of Items
0.764	5

Table 6 Cronbach alpha values for section C of structured questionnaire

Cronbach's Alpha	N of Items
0.703	5

Table 9 showed the acceptance remark for all statements in response to investigative questions on the role played by accountants in setting-up a corporate carbon management system in manufacturing firms and a grand mean of 4.954 which is above the decision threshold of 3.0. Table 10 showed the t-test result to determine the role accountants play in setting-up a corporate carbon management system in manufacturing firms. Our analysis revealed a statistically significant result as shown in the above were ($t = 229.827, 280.330, 119.940, 229.827$ and 229.827 for investigative questions 6 to 10. $N = 80$ and $p = 0.000$) thus we reject the null hypotheses and conclude that Accountants play a role in setting-up a corporate carbon management system in manufacturing firms.

The results (Table 11) suggest that TESD have strong significant positive relationship with the ROE at 5% levels of significance indicating that any increase in the unit values of TESD will result to a corresponding increase in unit value of ROE. Finally, from Table 12, result revealed that there's a statistically significant F-statistic of 11.288 (also revealing from our ANOVA table is a p-value = 0.000, that is, $p\text{-value} < 0.05$). The coefficients table, (see Table 13), showed that we reject the null hypotheses and conclude that there is a relationship between corporate carbon emissions and disclosure and corporate financial performance of manufacturing firms.

Table 7 Descriptive Statistics for Hypotheses 1

	N	Mean	Std. Deviation	Remark
There is a global mandatory compliance on Carbon Management System to ease the effect of climate change	80	4.99	0.112	Accept
My firm has totally complied to this mandate and promotes disclosure of carbon emission and setting up of carbon management system	80	4.99	0.112	Accept
Carbon Accounting as a climate-change issues has been fully incorporated into accounting and reporting.	80	4.99	0.112	Accept
Carbon related information have received attention to research and development in my company	80	4.99	0.112	Accept
The Board of Directors has taken carbon disclosure as an integral part of my company's Annual report	80	4.99	0.112	Accept

Table 8 One-Sample Test

	Test Value = 0.05					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
There is a global mandatory compliance on Carbon Management System to ease the effect of climate change	395.000	79	0.000	4.938	4.91	4.96
My firm has totally complied to this mandate and promotes disclosure of carbon emission and setting up of carbon management system	395.000	79	0.000	4.938	4.91	4.96
Carbon Accounting as a climate-change issues has been fully incorporated into accounting and reporting.	395.000	79	0.000	4.938	4.91	4.96
Carbon related information have received attention to research and development in my company	395.000	79	0.000	4.938	4.91	4.96
The Board of Directors has taken carbon disclosure as an integral part of my company's Annual report	395.000	79	0.000	4.938	4.91	4.96

Table 9 Descriptive Statistics for Hypotheses 2

	N	Mean	Std. Deviation	Remark
Accountants uses Carbon Disclosure Project reports to examine empirically the implementation of systems by firms and evaluate firms true carbon performance	80	4.96	0.191	Accept
An objectives of carbon accounting is to assist managers to formalize climate change strategy	80	4.98	0.157	Accept
Carbon Management System brings about environmental effectiveness and economic efficiency	80	4.91	0.363	Accept
Firms with higher quality Carbon Management System have achieved better carbon mitigation.	80	4.96	0.191	Accept
Better performance in carbon management can lead to both tangible and intangible outcomes, such as lessen the financial burden and even bring profit for the company that does well	80	4.96	0.191	Accept

This work examined the role of carbon accounting in corporate carbon management system, and focused on 6 years period from 2011-2016. The first hypothesis which measured the extent of manufacturing firm's awareness and disclosure of carbon related information showed a strong support for the hypothesis. Respondents from most of the sampled firms showed that the firm has totally complied and promotes disclosure of carbon emission and setting up of carbon management system. This could be attributed to strong board support, as the respondents showed that Board of Directors took carbon disclosure as an integral part of my company's Annual report. Considering the problems that threaten the sustainability of the environment, companies need to be aware of the impact of their activities on the environment (Khoiruman & Haryanto, 2017).

Table 10 One-Sample Test

	t	Df	Test Value = 0.05			
			Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Accountants uses Carbon Disclosure Project reports to examine empirically the implementation of systems by firms and evaluate firms true carbon performance	229.827	79	0.000	4.913	4.87	4.96
An objectives of carbon accounting is to assist managers to formalize climate change strategy	280.380	79	0.000	4.925	4.89	4.96
Carbon Management System brings about environmental effectiveness and economic efficiency	119.940	79	0.000	4.863	4.78	4.94
Firms with higher quality Carbon Management System have achieved better carbon mitigation.	229.827	79	0.000	4.913	4.87	4.96
Better performance in carbon management can lead to both tangible and intangible outcomes, such as lessen the financial burden and even bring profit for the company that does well	229.827	79	0.000	4.913	4.87	4.96

Table 11 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.308 ^a	0.095	0.087	.992538147353655

a. Predictors: (Constant), FMS, Total (ESD)

Table 12 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	22.240	2	11.120	11.288	0.000 ^b
Residual	211.803	215	0.985		
Total	234.043	217			

a. Dependent Variable: ROE

b. Predictors: (Constant), FMS, Total (ESD)

Table 13 Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	0.289	1.054	0.274	0.784
	Total (ESD)	-0.596	0.153	-3.890	0.000
	FMS	0.281	0.084	3.335	0.001

a. Dependent Variable: ROE

The second hypothesis which identified the role of accountants in setting-up a corporate carbon management system in manufacturing firms found that accountants play a role in setting up a corporate carbon management system. The respondents agreed to the fact that carbon accounting as a climate-change issue were fully incorporated into accounting and reporting systems of these companies. One objective of seeking such information is to assist managers formalize a corporate climate change strategy. This is because companies need information that potentially can be used as primary analytical tools related to market share, cost competitors and sales volume (Honggowati et al., 2017).

The study also showed that implementing the carbon management system brings about environmental effectiveness and economic efficiency. Asmeri et al. (2017) showed that CSR and CSR reporting are tools of legitimacy for companies to demonstrate their obedience, also that environmental performance has effect on CSR disclosure.

The study further showed that there is a strong and positive relationship between carbon accounting and return on equity of manufacturing firms. This is because Carbon Management System is a veritable tool for sustainable development. A number of companies see sustainable development as capable of offering a wide range of emerging business opportunities and as such are creating or redesigning their business models (Jones et al., 2017). The study showed that firms with a quality Carbon Management System in place achieve better carbon mitigation, because it can lead to both tangible and intangible outcomes.

Conclusion

The findings of the study are summarized as follows: 1) manufacturing firms are aware and disclose carbon related information, 2) accountants play a role in setting-up a corporate carbon management system in manufacturing firms, 3) there is a positive and statistically significant relationship between corporate carbon emissions and disclosure and corporate financial performance of manufacturing firms.

Carbon cost management is a subset of the drive toward “environmental cost accounting” that highlights the cost impacts beyond those related to a specific cost object, such as a product. Carbon management accounting is one part of sustainability accounting designed to provide managers with information that will assist companies facing short and long-term decisions about carbon emission issues in a world where company activities are strongly implicated in the related ecological crisis. These are inevitable challenges to traditional accounting methodology because carbon accounting also covers non-financial (so-called ‘narrative’) disclosure of corporate climate impact and carbon benchmarking. This study was aimed at providing empirical evidence on the role of carbon accounting in corporate carbon management systems in Nigeria. The results show a positive relationship between carbon accounting and performance.

Based on the findings of this study, the following recommendations are here given: 1) adaptation to conditions that include long-term changing dynamics of the natural environment should be encouraged and the focus of finance and accounting system should not only cover short-term outcomes and management of short-term costing, reporting and disclosure but also long-term climate risks, 2) following the lack of research with a carbon accounting focus and scant evidence on efforts required and expended by accountants in that regard, Carbon management system should receive considerable attention of academic researches studies of empirical nature, 3) in addition to penalty for carbon emission, stronger penalty for failure to disclose carbon emission information should be employed.

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Appendix

Appendix: Questionnaire

Section A: Respondents Data

Please tick (✓) in the appropriate boxes provided

Name of Organization:

1. Sex:

Male	()
Female	()

2. Years of Experience:

0–5 years	()
6–10 years	()
11–15 years	()
16 years and above	()

3. Management Level:

Top level management	()
Mid-level management	()

Key:

SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree; UD = Undecided

Section B: To what extent are manufacturing firms aware and disclose carbon related information?

SN	Items/Suggestions	SA	A	UD	D	SD
1.	There is a global mandatory compliance on Carbon Management System to ease the effect of climate change					
2.	My firm has totally complied to this mandate and promotes disclosure of carbon emission and setting up of carbon management system					
3.	Carbon Accounting as a climate-change issues has been fully incorporated into accounting and reporting.					
4.	Carbon related information have received attention to research and development in my company					
5.	The Board of Directors has taken carbon disclosure as an integral part of my company's Annual report					

Section C: What role do accountants play in setting-up a corporate carbon management system in manufacturing firms?

SN	Items/Suggestions	SA	A	UD	D	SD
6.	Accountants uses Carbon Disclosure Project reports to examine empirically the implementation of systems by firms and evaluate firms true carbon performance					
7.	An objectives of carbon accounting is to assist managers to formalize climate change strategy					
8.	Carbon Management System brings about environmental effectiveness and economic efficiency					
9.	Firms with higher quality Carbon Management System have achieved better carbon mitigation.					
10.	Better performance in carbon management can lead to both tangible and intangible outcomes, such as lessen the financial burden and even bring profit for the company that does well					