INTELLECTUAL CAPITAL AND ORGANIZATIONAL SUSTAINABILITY IN MANUFACTURING FIRMS IN RIVERS STATE

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ABSTRACT

Over the years, the high mortality rate of the manufacturing firms has negatively affected the economy. This situation continues despite many scholarly efforts geared at ensuring continuous sustenance of the manufacturing firms. This study examines the relationship between intellectual capital and organizational suitability. The population for this study comprises of 266 supervisors and management staffs. The krejcie and Morgan (1970) table for sample size determination was used to arrive at a minimum sample size of one hundred and fifty seven (157) management employees. A conceptual model was developed and ten (10) hypotheses were formulated and tested with Kendall's tau statistical technique using the statistical package for social science (SPSS). Data were collected through personally administered questionnaire. The findings revealed a positive and significant relationship between intellectual capital and organization sustainability. Based on the findings, it was concluded that the dimensions of intellectual capital have significant relationship on the sustainability of manufacturing firms. Based on the conclusion, it was recommended that employees with new ideas should be encouraged so as to help secure the economic, social and environmental sustainability of the firm.

Keywords: Intellectual capital, human capital, organizational sustainability, environmental sustainability and economic sustainability.

1.1 Background to the Study

Organizational Sustainability has become a prominent concept in management and an important subject of discussion in the press, management meetings, political arenas, and academic community. Conversations and debates about what it is, how important it is, what should be done about it, and how quickly we should act are everywhere (Mohrman & Worley, 2010). Organizational sustainability is said to enhance the ability of business organizations to better understand their host communities, customers, employees, stockholders and proffer solutions to their peculiar needs which may lead to better cooperation with the organization (Epstein & Buhovac, 2011). Several scholars believed that trust is greatly enhanced between the organization and its stakeholders due to sustainability performance reporting (Epstein &Buhovac, 2011).

Osborne (1998) opined that economic sustainability is a critical factor for business partners, customers, employees, suppliers and the society at large with the rising cost of production, effective and efficient use of available resources through sustainable economic practices has become very imperative considering the future economic development and survival of manufacturing firms in the economy.

Hami, Mahamad and Ebrahim (2014) posit that, for any economy to survive for short term and long term purpose, then it must be able to meet the 'three bottom line' which has to do with the ability of the manufacturing firms to achieve sustainability in finance, natural environment and human. They should be able to positively affect its stakeholders' quality of life. As the manufacturing sector continues to experience expansion in its production, the managers have to strive to implement business strategies that will encourage sustainability and help in protecting the environment, creation of work opportunities and provision of healthy living environment for host communities.

Gillasp (2014) submitted that environmental sustainability is of immense importance to both the natural environment and the organization as it helps in preventing the diminution of mineral and other natural resources, while it ensures for short and long-term environmental sustainability. More so, it ensures that the meeting of aspirations of the present generation does not endanger the safety of next generation. That is, environmental sustainability has the tremendous ability to care for natural environment and sustain its viability.

Intellectual capital (IC) has been studied and revealed by many scholars to be an important asset to business organizations. Handy (1989) posits that "intellectual assets are three or four times the tangible book value of a company", that is, the value of any business is enhanced when it has highly developed intellectuals working in it. Simply put, the greater the intellectual asset the greater the book value of the organization. Burren (1999) also opined that the intangible assets (Intellectual Capital) represent more than seventy five percent of any organization's value. In the same point of view, Osborne (1998) indicated that 80 percent of an organization's worth is not physical but the intangible value of its intellectual capital.

1.2 Statement of the Problem

Organizational sustainability is a basic challenge confronting organizations in developing countries like Nigeria. The ability to provide affordable food, clean and portable water for the populace, electricity and shelter, road networks, security for present and future generation, and education for the citizens as well as creating rewarding working opportunities for present

and next generations is a task that organizations and countries cannot do without (Iganigan & Unemhilin, 2011).

Diamond (1997) submits that, "unless natural resource use is checked, modern global civilization will follow the path of ancient civilization that collapsed through over-exploitations of their natural resource based". This is major concern for both manufacturers and government institutions all over the world.

Interestingly, Adams and Jeanrenaud (2008) in their work on sustainability observed that, economic expansion has led to high degree of environmental degradation. As companies continue to expand their operations, the resulting effect is the decline in the natural environment. Unsustainable practices by manufacturers has been unambiguously likened to harmful expansion of a cancer, due to the fact that it eats the very system it derives it source of living, from thereby lowering the ability of the organization to survive.

Life as we know it, the high standard of living that many people have become accustomed to, is directly threatened by the very patterns of organizational activity that created our comfortable lives in the first place. We are confronted with how deeply held this pattern of activity is (Mohrman & Worley, 2010).

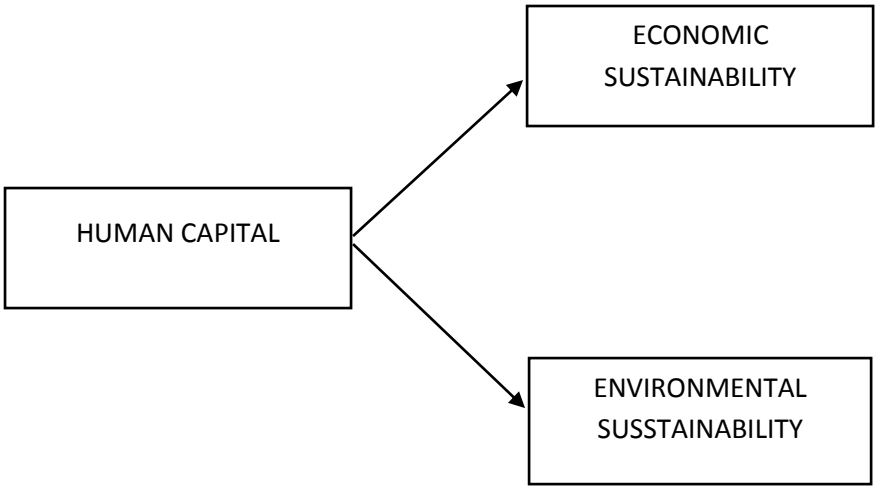
The issues concerning environmental sustainability have continued to satiate management and scholarly discussions, this has brought to fore the importance of environmental sustainability. The problem of lack of environmental sustainability was further expatiated by John (2001) who submitted that, "the physical, chemical as well as the biological integrity of our planet is being compromised daily", this is as a result of the activities of manufacturing and other business firms in the society.

Pathak (2015) while discussing the effect of unsustainable manufacturing practices opines that, though the great revolution in some European countries during the "Industrial Revolution" has an enormous impact on the countries' economies. It has also resulted in a lot of negative effects such as "the depletion of natural resources, carbon emissions, and environmental pollution". He further noted that the industrial revolution has brought upon the world untold environmental concerns.

In Nigeria's oil rich region of Niger Delta, there have been issues of Multi-National Corporations dumping their waste materials and chemicals in the waterways, thereby endangering the aquatic life as well as the life of the inhabitants and future generations of the affected areas. Another manifestation of unsustainable manufacturing practice is the ozone layer depletion which has led to the issue of climate change becoming a popular topic of discourse at several international conferences, while developed economies are moving towards green manufacturing, Nigeria is far from implementing sustainable developmental measures that will help curb the impact of climate change, this objectives will probably require managers to change their attitudes towards the environment (Pathak, 2015).

In order to forestall the eventual collapse/demise of the manufacturing sector, this study intends to investigate whether the appropriate harnessing of intellectual capital within the sector could help leverage the continuous unsustainable manufacturing practices in the country and place the sector on the fast recovery.

Operational Framework



1.3 Aim and Objectives of the Study

The purpose of this study is to examine the impact intellectual capital has on organizational sustainability among manufacturing firms in Port Harcourt. While it's specific objectives are as stated below:

i. To investigate the relationship between human capital and economic sustainability of manufacturing firms.
ii. To investigate the relationship between human capital and environmental sustainability of manufacturing firms.

1.4 Research Questions for the Study

In order to achieve the objectives of this study, the following research questions were developed from the aim of the study stated above;

i. Is there significant relationship between human capital and economic sustainability of manufacturing firms in Port Harcourt?
ii. Is there significant relationship between human capital and environmental sustainability of manufacturing firms in Port Harcourt?

1.5 Research Hypotheses for the Study

In order to provide answer to the questions raised in 1.4, the under-listed hypotheses were developed:

HO_1: Human capital has no significant relationship with economic sustainability of manufacturing firms in Port Harcourt.
HO_2: Human capital has no significant relationship with social sustainability of manufacturing firms in Port Harcourt.

2.1 Theoretical Framework

The theoretical foundation of this study is based on the Core Competence Theory (CCT) and the Resource-Based View (RBV). Most empirical studies have relied on these theories as the

baseline theories when discussing intellectual capital and sustainability (e.g; Peppard & Rylander, 2001; Cheng, Zhu & Xie, 2004; Cheng, et al. 2008).

The concept of Core Competence Theory was developed by Professors Garry Hamel and C.K. Prahalad in 1990. Gupta (2015) opined that, to deliver sustainable competitive advantage, organizations must adopt the concept of core competence. By definition, Core competency is "a unique capability acquired by a firm over a period of time in form of a resource, operations facility, specially skilled manpower, technology know-how or delivery of service which gives the firm sustainable competitive advantage in future in quality, design, production or distribution of a product/service or in cost of the product and is viewed as a relative value addition by a prospective customer" (Gupta, 2015).

Andriessen (2001) while discussing intellectual capital and sustainability refers to the Core Competency Theory as the baseline theory. The concept of organizational sustainability as well as the idea of intellectual capital which is concern with the development of intangible assets including human capital, organizational capital and social capital for sustainable organizational competitiveness.

The Resource-Based View (RBV) theory was first developed in 1959 by E.T. Penrose. The Resource-based view (RBV) has gained prominence in the field of management research over the last decades. It focuses on the human resources and the way they are deployed by management in the organizations, and how they contribute to the creation and development of value within the firm (Peppard & Rylander, 2001).

Core competencies and Resource-based view theories focuses on the combination of organizational knowledge and its technical capacities which allow an organization to compete favourably with its contemporaries. Theoretically, "a core competency should allow an organization to expand into new end markets as well as provide a significant benefit to customers. It should also be hard for competitors to replicate" (Andriessen, 2001). Firms in the manufacturing sector of the economy are advice to identify their core competence and they should pay attention to them and try to develop them more.

As submitted by Gupta (2015), core competencies best provide the "best chance for an organization's sustainable growth and survival, as these factors are what differentiate the company from competitors on the long-run".

2.2 Concept of Intellectual Capital

Intellectual capital has continued to attract exceptional attention from scholars all over the world due to its perceived benefits to organizational performance and sustainability. Empirical evidences have shown that, the overall success of a business could partly be explained by the usage of its available intangible asset (Hamzah & Ismail, 2008). The intellectual capital inherent in an organization could be an added advantage among its competitors. The proper alignment of intellectual capital in the strategic management philosophies through the formulation and implementation of favourable policies is a way of strengthening the human capital in the firm and may lead to enhancing organizational competency. In separate studies, O'Donnell et al (2003), Demediuk (2002), April (2002), and Mohd and Hamza (2008) found that knowledge is a distinguished and strategic economic resource and will soon take over from financial and physical assets as most strategic organizational assets.

Viedma (2007) in his study on Intellectual Capital Theory, submit that "intellectual capital has undergone extraordinary development since the beginning of the 1990s". This view may partly be explained by the fact that more practitioners and academics are increasingly subscribing to the fact that intellectual capital is a key factor for the creation of more value to the organization and its stakeholders.

The concept of intellectual capital (IC) was first coined by an economist, John Kenneth Galbraith, he came up with the term in the year 1969. Therefore he is regarded as the originator of the concept (Fadaei, Taleghani & Noghlebari, 2013). Stewart (1991) submitted that American firms could use the abundance of intellectual capital as a favourable and valuable instrument to compete with their contemporaries.

Although there appears to be no consensual agreement on the definition of intellectual capital, however, most scholars have based their definition on the Intellectual Capital Theorists definition, they defined the concept based on the three components making up the concept "human capital, relational or social capital and organizational or structural capital". Human capital is said to comprise "employee knowledge, competency and brain power", social capital is made up of "relations with customers, suppliers, distributors and other related parties", while organizational capital comprises "organizational systems, culture, structure, climate, strategies, practices and processes" (Demediuk, 2002; April, 2002; O'Donnell, et al, 2003; Mohd & Hamza, 2008).

Viedma (2007) defines intellectual capital as "the knowledge and other intangibles that produce or create value in the present and knowledge and other intangibles that will produce or create value in the future". This definition takes into consideration the present as well as the future values of the human capital inherent in the firm.

2.2.1 Human Capital

Contemporary scholars have submitted that human capital remains a strategic organizational resource despite its consideration as a sub-construct of intellectual capital (Hormiga, Batista-Canino & Sanchez-Medina, 2010; Johanson, 2005; Marr & Roos, 2005). In earlier studies by Bontis (1998) and Viedma (2001) human capital was said to be an organization's machine for the generation of innovative ideas, and remains a great asset for the organization. Likewise, lack of adequate human capital may lead to ineffectiveness in an organization (Edvinsson & Malone 1999).

In Chen, *et al.,* (2004) human capital was seen as the foundation of intellectual capital; they defined human capital as the employees' problem solving skills, that is, individual possession of knowledge to visualize and think of a possible way to create solutions for a problem or situation. Chen, et al (2004) further stressed that, these skills reside in the employees not the organization. In related studies by Johanson (2005), Marr and Roos(2005), and Hormiga, Batista-Canino and Sanchez-Medina (2010), human capital was described as a strategic component of intellectual capital which other elements depend on. While, Viedma (2001) noted that human capital is "a potential source of innovation and generation of ideas for the organization, thus providing added value of importance".

There are several definitions of human capital (HC), Chen, *et al.* (2004) defined it as "knowledge, skills, experience that employees utilize in their duties, and they go with it at the end of the working day and when leaving the organization". While Bontis (1996) defined human capital as the knowledge, skills, experience, intuition and attitudes of the workforce.

He further submitted that organizations can better their level of intellectual capital by increasing their employees' capability.

Human capital was defined by Sherrill (1998) as "the knowledge, skill and capability of individual employees providing solutions to customers". Human capital is the generalization of an organization's capability to bring out the best from its employees to proffer solutions from within. It should be a source of added competitive advantage and achievable through research and development, brainstorming sessions, re-engineering of company processes and procedures, enhancing employees' skills (Sherrill, 1998).

2.3 Concept of Organizational Sustainability

The concept of sustainability originated from the 1987 report of the World Environmental and Development Commission, popularly known as the Brundtland Commission, named after its chairperson, Gro Harlem Brundtland, who happened to be the Norwegian Prime Minister then (Nkamnebe & Nwankwo, 2010). The concept has evolved over the last few decades, from being mere regulatory necessity. It has grown to prominence in strategic management and decision making today, especially in the manufacturing sector (Hawken, Lovins & Lovins, 1999; Anderson, 1998; Prahalad & Hammond, 2002; UN Global Compact, 2004; Scientific American, 2005).

Sustainable manufacturing requires manufacturing firms to put into consideration long term economic, environmental, and social effects when formulating the production and other policies (Setia & Soni, 2013). Manufacturing firms should implement effective sustainability practices, this can drive competitive advantage for an organization and power it towards a more innovative, sustainable and green future.

The concept of organizational sustainability has gradually become an important rating factor, driver of growth, profitability, value creation, social relationship builder, a survival tool, for organizations around the world. Sustainability-led manufacturing enables manufacturing organizations to differentiate their products and services in a crowded marketplace (Setia & Soni, 2013).

2.3.1 Economic Sustainability

Economic sustainability has great implications for manufacturing firms, as submitted by Hami, Muhamad and Ebrahim (2015). The emergence of sustainable manufacturing concept shows a rising change in corporate world policies, this has ensured that manufacturing firms had to re-strategized and formulate policies that are in tandem with the global thinking of sustainable manufacturing. The current conditions and continuous awareness been created about sustainable manufacturing, has shown that any firm that hope to remain economically relevant, need to reconsider its production policies by inculcating sustainable manufacturing practices into their policies.

Khan, Dewan and Chowdhurry (2014) concluded that economic sustainability consists of several aspects including "employment, sales growth, income stability, profitability and return on investment". While in an earlier research, Doane and MacGilivray (2001) submitted that economic sustainability is "the most elusive component of the triple bottom line approach which includes the economic, social and environmental sustainability".

Economic sustainability is defined as "the degree to which a company actively and constructively use its resources to support the social and economic development of

communities, through direct investments of cash, in-kind support or staff time, or through company policies that generate community capital, such as local sourcing, hiring, partnerships and education" (Buried Treasure, Sustainability, 2001).

2.3.2 Environmental Sustainability

Kamara, Coff and Wynne (2006) opine that the concept of environmental sustainability can be traced as far back as the thirteenth century, however it has re-surfaced in management and environmental literature starting 1970's and since then it has drawn wide spread attention from several scholars with diverse opinion but all agreeing on its importance to the maintenance of the eco-system.

Pathak (2015) noted that the industrial revolution witnessed in Europe in the last century has "transformed society and its interaction with the environment, increasing the use of natural resources and the pace of development of new products and processes". The continuous exploitative nature of humans through production activities have left the natural environment depleted.

Roper (2012) stressed that "weak sustainability prioritizes economic development, while strong sustainability subordinates economies to the natural environment and society, acknowledging ecological limits to growth". Similarly, Khan, Dewan and Chowdhurry (2014) submitted that natural environment sustainability covers a wide range of indicators and that all firms contribute to the degradation of the environment through factors such as "water and energy use, waste and emissions, waste management, space management and hygiene factors".

There are several definitions of environmental sustainability; Goodland (1995) defined environmental sustainability as "the maintenance of natural capital, arguing that environmental seeks to improve human welfare by preserving the sources of raw materials used for human needs and ensuring that the sinks for human waste are not exceeded in order to prevent harm to humans".

United States Environment Protection Agency (2014) opined that environmental sustainability is defined as the creation and maintenance of good environment conditions for human habitation. That is, existing in a "productive harmony that permits fulfilling the social, economic and other requirements of present and future generations".

The continuous impact of human activities on the eco-system has negative effect on its sustainability. The manifestation of the negative effects of human activities on the environment includes global warming, depletion of the ozone layer. This has culminated in death of humans, plants and animals. Recently, most people have come to realized that our actions and inactions are responsible for the level of environmental degradation and its consequences are staring us in the face (Pathak, 2015).

3.1 Research Design

Nachmias and Nachmias (1982) defined research design as "a model which allows a researcher to draw inference concerning causal relations among the variables under investigation". In this study the cross sectional survey, which is a type of quasi-experimental research design, was used. The quasi-experimental design was adopted since the respondents were not under the control of the researcher, while the cross sectional design was adopted because the study has to do with the collection of data from respondents at different locations

and time, and because the study involves the analysis of interrelationships among variables (Levin, 2006; Samkange, 2012).

3.2 Population of the Study

As noted by Hassan (2016) a research population is "generally a large collection of individuals or objects that is the main focus of a scientific query". In other words, a research population can be said to consist of individuals having similar characteristics which is of concern to the researcher.

The population for this study consists of all the employees' of manufacturing firms in Rivers State. As reported by the Manufacturing Association of Nigeria (MAN) Rivers/Bayelsa States Chapter on their website (http://phmanufacturersnigeria.org), there are thirty two (32) manufacturing firms in Rivers State. In order to have easy accessibility, the researcher adopted thirteen of these manufacturing firms which are located within Obio/Akpor Local Government Area and Port Harcourt City Local Government Area, and are into plastic manufacturing as the target population for this study. The accessible population from the thirteen firms included managers, supervisors and foremen. Record shows that there are a total of two hundred and sixty six (266) managers, supervisors and foremen among the thirteen firms, as shown in the table below:

S/N	Name of Organization	Population Size
1	Ambrus Plastics	12
2	Dozie Plastic Company Nig.	19
3	Sunflower Manufacturing Company	35
4	Mrs Mercy Plastic Ventures	17
5	C and B Plastics Limited	16
6	Ace Toys & Plastics Nigeria Ltd	14
7	Belhope Plastics Industries Ltd.	26
8	Explosive & Plastic & Co Ltd	19
9	General Plastic Nigeria Ltd	25
10	Metal & Plastic Industries (Nigeria) Ltd	19
11	New China Rubber & Plastic Footwear Ind. Ltd	30
12	United Plastic Conglomerates Nigeria Ltd	21
13	Zenith Plastics Conglomerates Ltd	13
	Total	**266**

Source: The Researcher, 2017.

3.3 Sampling Procedure and Sample Size Determination

A sample is defined as "a finite part of a statistical population whose properties are studied to gain information about the whole" (Webster, 1985). In social sciences it can be defined as "a set of respondents (people) selected from a larger population for the purpose of a survey" (Mugo, 2002).

The Krejcie and Morgan (1970) table for determination of sample size was used to determine a minimum sample size of one hundred and fifty seven (157) respondents from the population of two hundred and sixty six (266). The research instrument was distributed using the random sampling technique to the respondents.

S/N	Name of Organization	Population Size	Sample size
1	Ambrus Plastics	12	7
2	Dozie Plastic Company Nig.	19	11
3	Sunflower Manufacturing Company	35	21
4	Mrs Mercy Plastic Ventures	17	10
5	C and B Plastics Limited	16	10
6	Ace Toys & Plastics Nigeria Ltd	14	8
7	Belhope Plastics Industries Ltd.	26	15
8	Explosive & Plastic & Co Ltd	19	11
9	General Plastic Nigeria Ltd	25	15
10	Metal & Plastic Industries (Nigeria) Ltd	19	11
11	New China Rubber & Plastic Footwear Ind. Ltd	30	18
12	United Plastic Conglomerates Nigeria Ltd	21	12
13	Zenith Plastics Conglomerates Ltd	13	8
	Total	**266**	**157**

Source: The Researcher, 2017.

HO_1: Human capital has no significant relationship with the economic sustainability of the manufacturing firms.

This null hypothesis was tested by correlating human capital and economic sustainability. The table below shows the results obtained:

			Human Capital	Economic Sustainability
Kendall's tau_b	Human Capital	Correlation Coefficient	1.000	.412*
		Sig. (2-tailed)	.	.024
		N	98	98
	Economic Sustainability	Correlation Coefficient	.412*	1.000
		Sig. (2-tailed)	.024	.
		N	98	98

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.1: Correlations between human capital and Economic Sustainability

As stated above, the Statistical Package for Social Sciences (SPSS) version 21 was used to examine the relationship between human capital and economic sustainability of the manufacturing firms using Kendall's tau_b statistical tool. This was done after prior analyses to ascertain that the data were distributed and the transformation of data to suit the technique. The analysis showed that human capital have a medium positive relationship with economic sustainability of the manufacturing firms, with tau_b = .412, n = 98, $p < .05$. This result shows that enhancing the human capital of the firm will positively influence their economic sustainability. Thus, the null hypothesis, which states that human capital does have significant relationship with economic sustainability, was rejected, while its alternative was accepted.

HO_2: human capital has no significant relationship with the Environmental sustainability of the manufacturing firms.

			Human Capital	Environmental Sustainability
Kendall's tau_b	Human Capital	Correlation Coefficient	1.000	.365**
		Sig. (2-tailed)	.	.000
		N	98	98
	Environmental Sustainability	Correlation Coefficient	.365**	1.000
		Sig. (2-tailed)	.000	.
		N	98	98

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.2: Correlations between human capital and Environmental Sustainability

The Kendall's tau_b correlational technique was used to test the correlation between human capital and environmental sustainability of the firms. The result as shown in the table above, reveals that, human capital has a medium positive effect on the environmental sustainability of the firms, with tau_b = .365, n = 98, and P < .05. Therefore, the null hypothesis that human capital has no significant impact on environmental sustainability was rejected and its alternative accepted.

5.1 Conclusion

Based on the results obtained from the analyses, it is concluded that the dimensions of intellectual capital have significant impact on the sustainability of manufacturing firms, especially those located within the Port Harcourt metropolis. Human capital has a positive significant relationship with economic and environmental sustainability of the manufacturing firms in Port Harcourt.

5.2 Recommendations

From the research analyses and conclusion above, the following recommendations are made:

1. Management should ensure that steps are taken to recruit qualified and competent human capital (resource) during the recruitment process so as to attract and maintain highly knowledgeable human capital that will help them drive the sustainability of their firms.
2. Management should design appropriate human capital developmental programmes to enhance the competences of its human resources so that they can be effective and efficient in the discharge of their duties, which will in turn ensure economic sustainability of the firms.

3. New and advanced processes and routines should be put in place to drive organizational capital of the firms.
4. Employees with new ideas should be encouraged so as to help secure the economic, social and environmental sustainability of the firms.
5. Complaints from all stakeholders (customers, host communities, etc) should be attended to promptly, so that a strong social sustainability can be built.
6. Host communities and other stakeholders should be incorporated in the schemes and plans of the firms, so as to enhance the social sustainability of the firm.
7. Policies should be formulated to guide against improper disposal of waste materials to safeguard environmental sustainability of the firms.
8. The organization should encourage a strong culture that will enhance the intellectual capitals inherent in their firms.

5.3 Contribution to Knowledge

This study has made an immense scholarly contribution to the burgeoning strategic management literature. The study provide an in-depth investigation of the concepts of intellectual capital and organizational sustainability, specifically as it concerns manufacturing firms located in Rivers State.

To the academic community, this work serves as a reference material, especially to strategic management students. The work is also of great importance to managers and policy makers in the manufacturing sector of the economy.

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