

OPERATIONS MANAGEMENT ACTIVITIES AND ORGANIZATIONAL SUSTAINABILITY IN OIL AND GAS COMPANIES IN RIVERS STATE

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Abstract

The study investigates the relationship between Operations Management Activities and Organizational Sustainability in Oil and Gas Companies in Rivers State. The study adopted quasi-experimental research design as it is a cross-sectional survey. A sample size of 234 was determined from an accessible population of 565 heads of departments and Operational Managers using Krejcie and Morgan sample table. 234 copies of questionnaire were distributed out of which 191 copies were retrieved and analyzed using Spearman's Rank Order Correlation Coefficient Statistic with the aid of SPSS version 21.0. The findings revealed a positive and significant relationship between Operations management activities and Organizational Sustainability. Hence, the study concluded that Operations management activities affect Organizational Sustainability in oil and gas companies in Rivers State, and recommended that management should embark on effective aggregate planning on the economic, environmental and social sustainability issues. They should also develop proper maintenance initiatives to reduce costs and wastage of materials. The study emphasized that Organizational competence could only be achieved in the area of human capital development through training of Operational Managers for effective performance of Operations management activities to ensure Organizational Sustainability. These findings could not be generalized to all business organizations, and all dimensions of operations management activities were not discussed in this paper, hence the next future research study will be developed to cover those areas.

Keywords: *Operations Management Activities, Aggregate planning, Maintenance, Organizational sustainability, Economic sustainability, Environmental sustainability, Social sustainability, Oil and Gas Companies, Rivers State.*

INTRODUCTION

The challenges in managing complex and sophisticated organizational design and operations, ecology and industry, the wake of climate change and the challenges in the global environment are increasingly threatening business around the world. There is a great demand that management should look beyond financial performance, but to integrate economic, environmental and social concern known as ‘Organizational sustainability indicators’ (Cella-de-Oliveira, 2013; Epstein & Widner, 2010; Dyllick, 2002; Moneva, Archel, & Correa, 2006; Wentworth, 2012; Dyllick & Hockerts, 2013; Ekwueme, Egbunike & Onyali, 2013). Organizational Sustainability stemmed from the Triple Bottom Line as used by scholars (*see* Rogers & Roberta, 2001; KPMG, 2002; Mc Entyre, 2003; Norman & Macdonald, 2004; Jamali, 2006; Wang & Lin, 2007; Ho. & Taylor, 2007; Hubbard, 2009; Munck & Borim-de-Souaza, 2012; Borim-de-Souaza, 2010; Fauzi, Svensson, & Rahman, 2010). Sustainability is important to Oil and gas firms as the industry serves as a major source of income in the economic development of Nigeria (Ogbonna & Ebimobowei, 2012; Ayuba, 2012). Hence, the importance of organizational sustainability in oil and gas industry in Rivers State needs not to be neglected or treated with disregard.

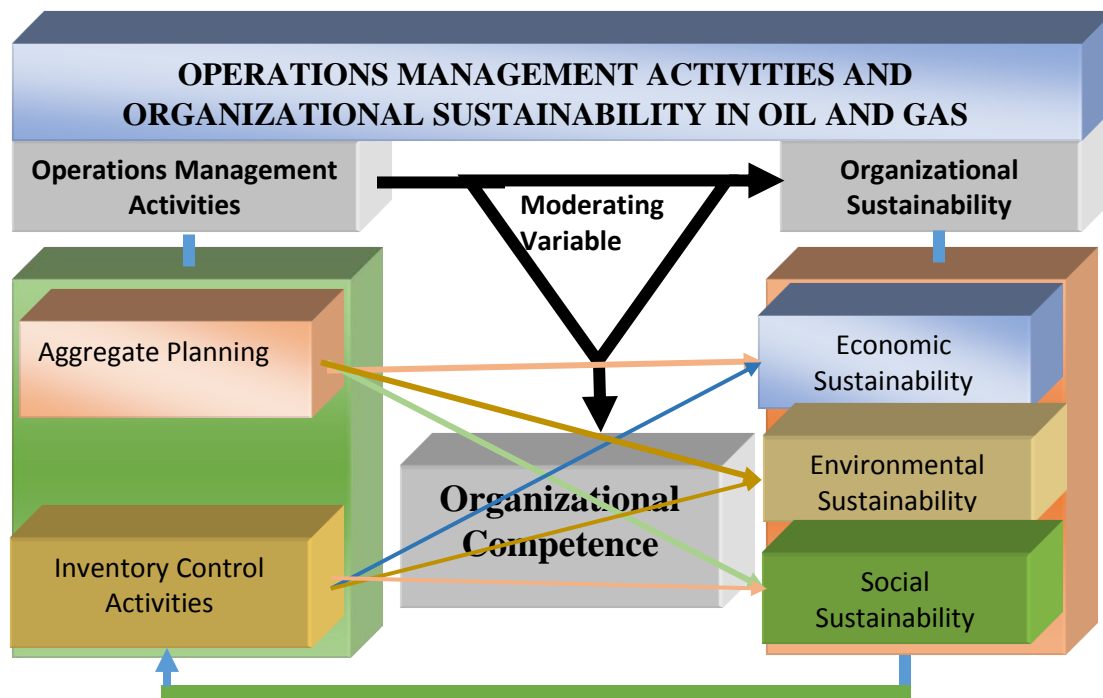
Organizational sustainability as a critical concept has prompted scholars over the years to examine the factors that influence it (*see* Hollingsworth, 2009; Hubbar, 2009; Cella-De-Oliveira, 2013; Ekwueme et al., 2013; Dyllick & Hockerts 2013). However, despite these trends of studies on factors that influence organizational sustainability, no serious research work has been conducted on the topic; “Operations Management Activities and Organizational Sustainability in oil and gas industry in Rivers State”. Again, the few research studies that examined operations management activities only focused on service organizations in the foreign environment. Therefore, to fill this gap in literature, this study critically investigated if operations management activities which has been studied in relation to organizational performance in the service sector (Prajogo & Goh, 2005) could also be examined in relation to organizational sustainability in the oil and gas companies in Rivers state of Nigeria, and to suggest possible solution to the problem of operations management activities that will facilitate the attainment of organizational sustainability in oil and gas companies in Rivers State.

STATEMENT OF THE PROBLEM

The major problem of non-sustainability in oil and gas companies in Rivers State is traced to lack of maintenance (Agbola & Olurin, 2003). As Maitland and Chapman (2014) noted, Oil spills has resulted in diverse damage of environmental assets, values and worth’s and has also caused difficult situations and increased poverty level among the host communities in Rivers State in Niger Delta Region. Medugu (2012) also noted that some of the problems stemmed from poor extraction and poor handling of excess gas through the gas and oil pipes are consequently

no potable water, aqua-lives lost including vegetation and ozone layer depletion. In some areas, their operation has been shut down which has caused non-sustainability in oil and gas companies. It is against these problems that prompted this study to investigate and examine the relationship between operations management activities and organizational sustainability in oil and gas producing companies operating in Rivers State, Nigeria.

FRAMEWORK OF THE STUDY.



Source: Researcher's Conceptualization, (2016). Dimensions of operations management were adopted from the work of Prajogo and Goh, (2005). Measures of organizational sustainability were adopted from the work of Elkinton, (1997).

AIM AND OBJECTIVES OF THE STUDY

The aim of the study is to examine the relationship between Operations Management activities and Organizational sustainability in Oil and Gas Companies in Rivers State. However, the objectives of the study include:

1. To ascertain how aggregate planning affects organizational sustainability in oil and gas Firms in Rivers State.
2. To examine how Inventory Control Activities affect organizational sustainability in oil and gas Firms in Rivers State.
3. To ascertain the degree to which organizational competence moderates the relationship between operations management activities and organizational sustainability in oil and gas Firms in Rivers State.

RESEARCH QUESTIONS

In the cause of this research, the following research questions were developed to guide the study based on the operational framework; they include:

1. What is the relationship between aggregate planning and economic sustainability in oil and gas companies in Rivers State?
2. What is the relationship between aggregate planning and environmental sustainability in oil and gas companies in Rivers State?
3. What is the relationship between aggregate planning and social Sustainability in oil and gas companies in Rivers State?
4. What is the relationship between Maintenance and Economic sustainability in oil and gas companies in Rivers State?
5. What is the relationship between Maintenance and Environmental sustainability in oil and gas companies in Rivers State?
6. What is the relationship between Maintenance and Social sustainability in oil and gas companies in Rivers State?
7. To what extent does Organizational competence moderate the relationship between Operations management activities and Organizational sustainability in oil and gas companies in Rivers State?

RESEARCH HYPOTHESES

The following null research hypotheses were formulated to provide tentative answers to the research questions:

- HO₁:** There is no significant relationship between aggregate planning and economic sustainability in oil and gas companies in Rivers State.
- HO₂:** There is no significant relationship between aggregate planning and environmental sustainability in oil and gas companies in Rivers State.
- HO₃:** There is no significant relationship between aggregate planning and social Sustainability in oil and gas companies in Rivers State.
- HO₄:** There is no significant relationship between Maintenance and Economic sustainability in oil and gas companies in Rivers State.
- HO₅:** There is no significant relationship between Maintenance and Environmental sustainability in oil and gas companies in Rivers State.
- HO₆:** There is no significant relationship between Maintenance and Social sustainability in oil and gas companies in Rivers State
- HO₇:** Organizational competence does not moderate the relationship between Operations management activities and Organizational sustainability in oil and gas companies in Rivers State.

SIGNIFICANCE OF THE STUDY

Scholars would find this research work very resourceful because it will serve as point of contact to assist in further research studies. This work would be of great value to production/operation managers, marketing managers, as well as financial managers in oil and gas companies in Rivers State and beyond, in their planning/decision making and control of organizational resources in order to ensure organizational sustainability.

SCOPE OF THE STUDY

The content scope of the study focuses on theories and concepts of operations management activities in order to ensure organizational sustainability in oil and gas companies in Rivers State. The geographical scope of the study focuses on oil and gas Companies that are directly engaged in oil and gas production and exploration in Rivers State, Nigeria. Finally, the study unit is at the organizational level, which focuses on the Departmental heads, Managers and Supervisors in five oil and gas Companies that directly participate in the production and exploration of oil and gas products.

REVIEW OF RELATED LITERATURE (THEORETICAL FARMWORK)

The beginning of scientific management paved way for development of Operations Management (Brownson & Naadimuthu, 1997; Jaja & Obipi, 2005; and Koontz et al., 2011). Sharma (2013) explained that the quantitative approach to management of productivity is rooted in scientific management. So, we may conclude that the earlier developers of these models derived their concept from the works of earlier contributors to quantitative management in an attempt to improve organizational productivity. The work of Frederick Taylor, Emerson and Frank Gilbreith demonstrated the earlier development of scientific management. Let us briefly discuss this development. Taylor's four techniques of management and Emerson's (1913) "twelve principles of efficiency" demonstrated the orientation of the scientific theories of solving problems of low productivity and workers' morale at the workplace through cost cutting and economic incentives to workers.

COMPETENCE THEORY

Helleloid and Simonin (1994) in Cella-De-Oliveira (2013) described competence as a well-organized set of knowledgeable skills, and technologies. Competence could also be viewed as assets comprising of certain task levels and activities to be carried out. While Mills, Boume and Richards (2002) argued that, organizational competence is when employee or the organization possesses the required ability to perform a given task effectively. This means that, competences must be applied towards some determined objectives. Competences must also possess the required capacity to sustain the objectives desired. Hence, Drejer (2000) in Cella-De-Oliveira (2013) explained more elements of which their absence denotes lack of competence. These elements include; technology, individuals, organizational and culture.

SYSTEM THEORY THAT SUPPORTS ORGANIZATIONAL SUSTAINABILITY

Development of the system theory could be credited to Ludwig, von Bertalanffy in 1951, from a published article (Griffin, 2005). If we take a critical look at System theory, it seems that sustainability is an aggregate of the economic, environmental and social justice (Cella-De-Oliveira, 2013) that formed an organizational sustainability. The concept of system theory

promotes the idea of having different component parts that interacts, and also interrelates and it operates as a whole via interdependent. The organization's ability to pursue its economic benefits while it maintains its environmental and social aspect, and have a friendly interaction with the environment to the extent that no destruction occur on the natural and anthro-capital as needed by humans and future generations will ensure sustainability in the organization (McElroy, 2008).

AGGREGATE PLANNING

Planning could be seen as the means of setting organizational objectives, by developing methods, and properly draw how the implementation, arrangements and allocating resources will ensure those objectives (UNDP, 2009). From the Encyclopedia of management, aggregate planning could be defined as the means whereby the organization develop, analyze, and maintain a preliminary and approximate schedule of the entire operations of the organization. The plan need to generally contain targeted sales forecasts, production levels, inventory levels, and customer backlogs etc. Therefore, aggregate planning as used in this research study could be seen as the planning process that considers every facet of the organizational operations, (both internal and external factors) into the entire operations of the organization. Therefore, when an organization lacks effective plan—it is in some ways similar to one who wants to erect a building without a good plan. Without the plan, it will be very challenging to portray the very pattern of that building, its cost, duration of the building construction, the resources required, and whether the finishing of the building will meet the specification of the owner (UNDP, 2009). Hence, planning assists the organization to define what they need, the project to accomplish and the strategies necessary to adopt in order to achieve it (UNDP, 2009).

MAINTENANCE

Maintenance is important to all organizations, but it seems most crucial to oil and gas companies based on their sophisticated drilling tools and gas flaring equipments, and the need to maintain human skills through training. As Dekker (1996, 1998) noted, during the early 1960s, Researchers placed much interest on how to optimize maintenance by focusing on development and implementation. Boschian, Rezg, & Chelbi (2008) stated that the well-known models are known as 'block replacement models' which emerged from the period of so-called age, and the time period of the maintenance activities solely depends on the age of the system. Furthermore, for block-type models which have to do with the time of the maintenance, operation needs to be determined in advance (Boschian et al., 2008). Hence, Oil and Gas firms are expected to take proactive measures by limiting the extent of their operation involving emissions of gas, and to make constant planning/evaluation and as well maintain their equipment frequently to arrest any situation that may cause emission of methane.

CONCEPT OF ORGANIZATIONAL SUSTAINABILITY

Organizational sustainability has been treated in literature to some extent over the years. The three pillars of sustainability as earlier promoted by Elkington, (1994a, 1994b, 1997, 1999) have become the popular sustainability indicators, which many researchers today adopt as measures of organizational sustainability (Lung & Leurat, 2014). Thesaurus dictionary looked at the verb "to sustain" to mean the ability to maintain or 'to endure' and it stressed the full meaning as being a

method used in resource management so that it does not permanently damage in a given time frame. Lung and Levrat (2014) asserted that sustainability has been generally defined by Brundtland (1987) as; *‘development that meets up with the needs of present situation of the society and the organization without compromising the condition of future of the generation to come to achieve their own needs’*. This meaning of sustainability seeks to incorporate the present issues as well as the future related needs, which demands critical planning and consideration of future benefits and sustainability. In line with this, this study focuses on three key areas of sustainability which includes; economic, environmental and social concern which the oil and gas Companies need to look at in their operations.

ECONOMIC SUSTAINABILITY

Economic sustainability could be defined as the maintenance of non-dealing reduction capital stocks (Spangenberg, 2005) in (Kalua, 2015). But in relation to this study, the meaning of economic sustainability as defined by Stavins, Wagner & Wagner (2003) will be more meaningful. They defined economic sustainability as “the maintenance of the present well-being by paying attention to inter-temporal distributional equity, dynamic efficiency and international equity”. Azapagic (2002) argued that achievement in economic viability serves as the most part of organizational sustainable development since benefits that come from job growth will afford society and the organization the possibility of improving their living conditions.

ENVIRONMENTAL SUSTAINABILITY

Under this model, economic sustainability is considered concurrently and non-hierarchically with social and environmental factors (Moure-Eraso et al., 2003). Cella-de-Oliveira (2013) argued that the concept of environmental sustainability is usually discussed with the biodiversity resources will be preserved; including how to regenerate the capacity and constraining non-renewable resources, recycling and waste generation. Dyllick and Hockerts (2002) argued that companies that are familiar with the environmental sustainability, only focus on consuming natural resources normally below its natural capacity, or below how this resources could be used in the production.

SOCIAL SUSTAINABILITY

The concept of social sustainability has its root in environmental sustainability with a strong ethical consideration based on moral obligations to future generations. As Brundtland (1987) noted, “even the physically narrow aspect of sustainability indicates attention for social justice between generations, and this concern must be logically extended to have a balance of equity within each generation. Hence, humans become the central focus of social sustainability. In addition, this is the community’s or society’s well-being.

AGGREGATE PLANNING AND ECONOMIC SUSTAINABILITY

Economic Sustainability cannot be realized without a diligent planning and control. It is clear that planning is the first and main management function as it provides foundation for other functions or activities of managers, which include: organizing, directing and control of the organizational resources in an attempt to achieve the organizational goals and objectives (Robbins & Coulter, 2013). Griffin (2005) argued that the planning process is the first basic management function that organization must address with a good understanding of the

environmental parameter. Managers must develop different types of goals and plans. Critical decision on how projects should be executed via planning is necessary. Planning is employed to coordinate different aspects of a project, including project plans, management of teams or individuals and workloads (Kerzner, 2003). A network model is sometimes used as effective means of planning for projects and other organizational activities with logical sequential and dependencies between tasks to be accomplished and are ascertained using an activity on network diagram that enables the identification of the critical path to follow (Pilcher, 1992). The network critical chain method is very useful in the planning process, and to reduce the potential delays that may occur in the execution of projects. Two basic models of network analysis are used for project planning and are illustrated by examples as shown below.

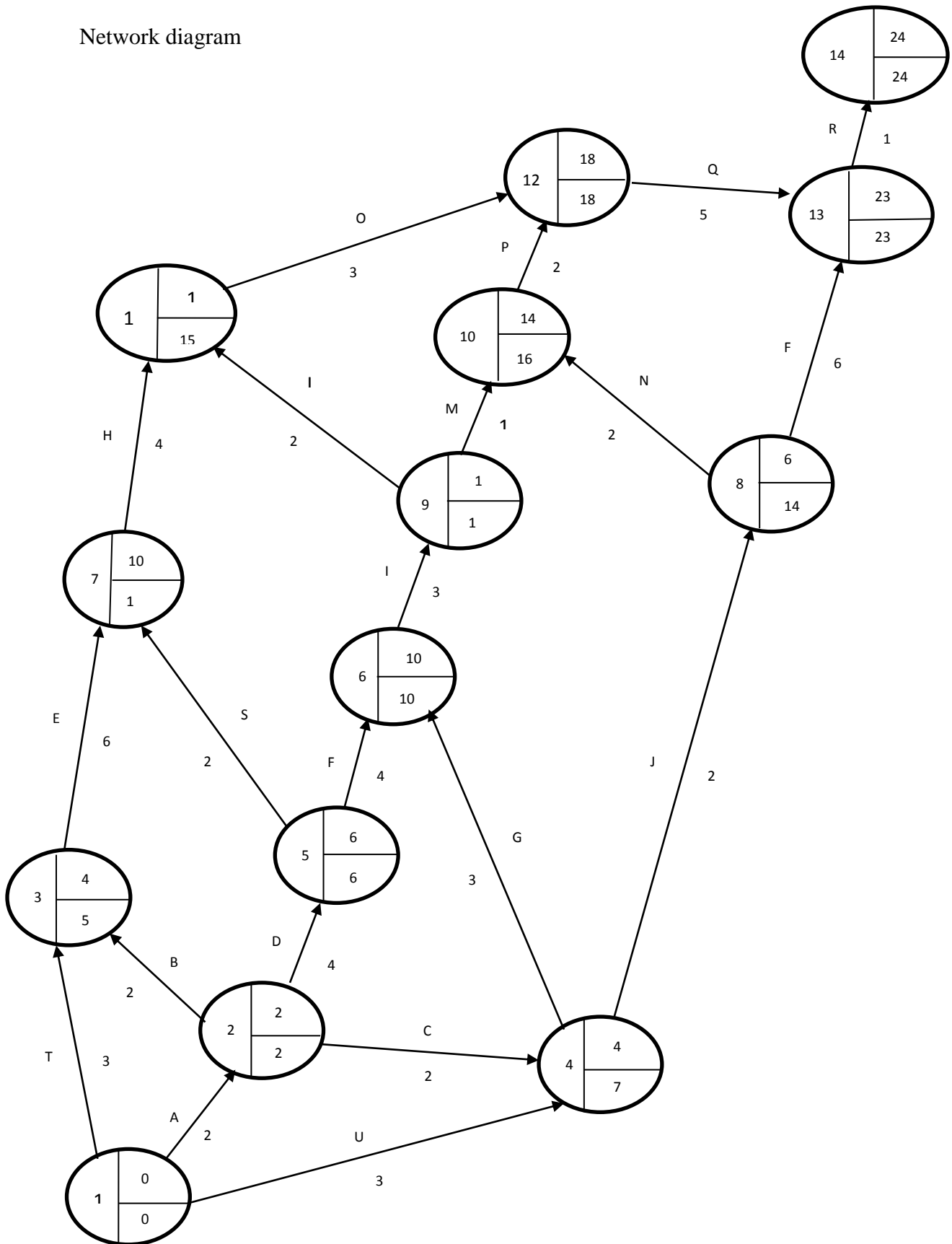
Illustration (1): The following data represents series of activities to be performed in order to establish a befitting oil exploration location by Shell Petroleum Development Company (SPDC). They best know their activities.

Activity	Predecessor	Duration
A	—	2
B	A	2
C	A	2
D	A	4
E	B	6
F	D	4
G	C,U	3
H	E,S	4
I	F,G	3
J	C,U	2

K	J	6
L	I	2
M	I	1
N	J	2
O	H,L	3
P	M,N	2
Q	Q	5
R	Q,K	1
S	D	2
T	P	3
U	—	3

Source: Researcher's illustrated data, (2015). This is based on examples cited by Taha, (2007).

Network diagram



(a) The Critical Path of the project becomes: A-D-F-I-L-O-Q-R

(b) Duration of the project is: $2+4+4+3+2+3+5+1=24$ weeks or 6 months.

(iii) The calculation of the EET, EST, EFT, EFF, LET, LST, LFF, TF and IF, would be computed

Where:

EET = Earliest Event Time; EST = Earliest Start Time; EFT = Earliest Start Time

EFF = Earliest Free Float; LET = Latest Event Time; LST = Latest start Time

LFT = Latest Finish Time; LFF = Latest Free Float; TF = Total Float

IF = Independent Float. (Pilcher, 1992; Mac'Odo, 2005; and Umoh, 2012).

Illustration (2): Network Analysis Tabular Computation.

Activity	Duration	Earliest	Earliest	Latest	Latest	EFF	IF	LFF	TF
		Start Time	Finish Time	Start Time	Finish Time				
		EST	EFT	LST	LFT				
1-2	2	0	2	0	2	0	0	0	0
1-3	3	0	4	2	5	1	1	2	2
1-4	3	0	4	4	7	1	1	4	4
2-3	2	2	4	3	5	0	0	1	1
2-4	2	2	4	2	7	0	0	3	3
2-5	4	2	6	2	6	0	0	0	0
3-7	6	4	10	5	11	0	1	0	1
4-6	3	4	10	7	10	3	3	0	3
4-8	2	4	6	12	14	0	5	5	8
5-6	4	6	10	6	10	0	0	0	0
5-7	2	6	10	9	11	3	3	5	3
6-9	3	10	13	10	13	0	0	0	0
7-11	4	10	15	11	15	1	0	0	1
8-10	2	6	14	14	16	16	6	0	8
8-13	6	6	28	17	23	11	3	11	11
9-10	1	13	14	15	16	0	0	2	2
9-11	2	13	15	13	15	0	0	0	0
10-12	2	14	18	16	18	2	2	0	2
11-12	3	15	18	15	18	0	0	0	0
12-13	5	18	23	8	23	0	0	0	0
13-14	1	23	24	23	24	0	4	0	0

Source: Researcher's illustrated data, (2015), based on example cited by Pilcher, (1992; Mac'Odo, (2005); and Umoh, (2012).

If the project above seem to be dragging or delaying, it is possible to crash the time for effective completion of the project in time. With some projects, the possibility of reducing the overall time may be expensive since it will involve additional labour or equipment that will best fit the various activities that links to the time. In this case, it will be meaningful to reduce or crashing

only the critical jobs. Umoh (2012) asserted that, the critical path is the bottle neck route. That is, it is only by looking for ways to shutting those jobs on the critical path that will reduce the overall project time. This implies that performance of non-critical jobs is unnecessary and becomes waste of the organizational resources (time, human and equipment). Hence, the need to crash jobs is best done on the critical path. Sometimes the need to crash time along the critical path is required in order to finish up the activities along the critical path, as we agreed that this would reduce the total project time and create room for some previously non-critical jobs to become critical. Thus, practices of network analysis may actually ensure effective planning operations and may improve organizational sustainability, if applied effectively.

THE MODERATING INFLUENCE OF ORGANIZATIONAL COMPETENCE ON OPERATIONS MANAGEMENT ACTIVITIES AND ORGANIZATIONAL SUSTAINABILITY

If we recall in our first attempt in the discussion on organizational competence, Fleury and Fluey (2006) argued that when associated if we are discussing it in relation to the work environment, competence has many dimensions which may be that of individual, collective or even organizational facet. While Helleloid and Simonin (1994) in Cella-De-Oliveira (2013) described competence as articulated sets of expertise, skills, and technologies. The study conducted by Sveiby (1987) suggest that knowledge-based assets may be looked at in three places which include the level and degree of competence found in people in the organization, the internal structure with respect to computer knowledge, patents, administrative assets, and models applications. Therefore, humans become the central aspect of competence, coupled with the organization.

METHODOLOGY

The study draws 565 respondents from five (5) major oil and gas producers as revealed by the Industry Supervising Government Agency, the Department of Petroleum Resources (DPR) of the Federal Ministry of Petroleum and Energy Resources. These companies are also highly concerned with critical production/operations management activities. To determine the sample size, Krejcie and Morgan (1970) sample table was employed which gives 234 sample size from a target population of 565 respondents. Bowley's (1960) individual sampling formula was used for strata sampling for each company. The data for this study was collected through structured questionnaire, and other valuable information was gathered from literatures in relation to the subject considered.

MEASURES

Aggregate Planning: Measuring areas or indicators include: plan for the financial viability of the organization. Plan for the organizational ecological environment, and plan for the organizational social environment.

Maintenance: Measuring areas include: Effective preventive Maintenance, Effective predictive or emergence maintenance/replacement, Effective Periodic inspection. Five (5) items were adopted from Fath-Halla (2014) and were used to measure this variable on the Likert 1-4 points scale type.

Economic Sustainability: Measuring areas include: Financial feasibility or financial commitment, and Organizational economic growth etc.

Environmental Sustainability: Measuring areas include: Effective implementation of environmental policies, Minimized greenhouse gas emissions, Adequate disposal of by-products and residues, Minimized leaks or spills of hazardous substances in the environment, Contingency plan in case of environmental disasters.

Social Sustainability: Measuring areas include: Provision of societal health facilities, Provision of quality education and training, and Participation in Community affairs.

The measures of organizational sustainability were measured using Five (5) items; each were derived from Cella-De-Oliveira's (2013) Social performance indicators, and were used to measure this variable on the Likert 1-4 points scale type.

TEST OF VALIDITY AND RELIABILITY OF THE STUDY INSTRUMENT

The study adopted the Content and face validity. To assess the face validity, copies of the questionnaire were made available to experienced researchers in the field of management sciences and were confirmed as valid items. For the Reliability of the Study Instrument, the strength of the internal consistency of the instruments, were tested using Cronbach's **Alpha reliability test** (Cronbach, 1951) as noted in Nunnally (1978) as a super-correlation of all the items on the scale which gave a reliability alpha of 0.7. and above.

The Strength of the Research Instrument

Variables	Cronbach's Alpha level.	Number of Cases.
Aggregate planning	0.763	5
Maintenance	0.756	5
Economic Sustainability	0.764	5
Environmental Sustainability	0.766	5
Social Sustainability	0.718	5
Organizational Competence	0.707	5
Total Items		30

Source: Version 21.0 SPSS Data Output, (2016).

The descriptive statistic involving a simple percentage along with tabulation showing the distribution of the attributes was adopted for the demographic variables. While the Spearman's Rank Order Correlation Co-efficient statistic was applied to test the formulated hypotheses of the study with the aid of SPSS.

Summarized Results and Decisions from the Tested Hypotheses				
Tested Hypotheses	Correlations	P-value Results	Interpretation	Decision
Hypothesis 1 IC&EcS	.686**	P-value 0.000 < 0.01	Strong Relationship	Rejected Ho
Hypotheses 2 IC&EnS	.774**	P-value 0.000 < 0.01	Strong Relationship	Rejected Ho
Hypotheses 3 IC&SS	.673**	P-value 0.000 < 0.01	Strong Relationship	Rejected Ho
Hypotheses 4 M&EcS	.669**	P-value 0.000 < 0.01	Strong Relationship	Rejected Ho
Hypotheses 5 M&EnS	.768**	P-value 0.000 < 0.01	Strong Relationship	Rejected Ho
Hypotheses 6 M&SS	.681**	P-value 0.000 < 0.01	Strong Relationship	Rejected Ho
Hypotheses 7 OC	.316	(Partial) Correlation	Weak moderating effect	Rejected Ho

Source: Research data, (2016).

Key:

IC= Inventory control;
 M= Maintenance;
 EcS = Economic Sustainability,
 EnS = Environmental Sustainability,
 SS = Social Sustainability

CONCLUSION

Based on the findings, operations management activities affect organizational sustainability in oil and gas companies in Rivers State. Specifically, from the foregoing; it is also observed that operations management activities are carried out by oil and gas companies but the extent to which these activities are performed have become a serious issue that confront them to attain organizational sustainability. Lack of organizational competence has also affected the relationship between operations management activities and organizational sustainability, which demands that the oil and gas firms need to train their key personnel for effective performance in the activities of operations management to attain organizational sustainability.

RECOMMENDATIONS

Based on the findings and conclusions of this study, the following recommendations are put forward for building strong sustainability in oil and gas companies in Rivers State. Hence, the study recommends that:

1. Oil and gas firms in Rivers State should embark on aggregate planning by incorporating the economic, environmental and social sustainability in their planning and decision-making.
2. There is need to give high regards to maintenance culture since most of their facilities (Buildings, Trucks, Pipelines, Oil producing equipment etc.) need periodic maintenance and reconstruction.
3. To give high regards to Organizational competence should not be neglected in the area of human capital development through training for effective operations management activities that will ensure organizational sustainability.

PRACTICAL IMPLICATIONS

Results have shown that good performance of operations management activities will improve the economic, environmental and social conditions and will ensure sustainability. Thus, for symbiotic existence and survival, it means that oil and gas companies must consider the situations with the society in their planning and operations, taking cognizance of the economic, environmental, and social conditions that will enable the Society to be sustained.

LIMITATIONS

The vast population and locations of the oil and gas companies were difficult to approach with questionnaire distribution and data gathering, which has led the study to focus on only five oil and gas companies that directly participate in the production and exploration of oil and gas products, and these may not be adequately generalized to cover all oil and gas firms.

FUTURE RESEARCH SUGGESTIONS

The findings from this study may not be generalized for all business environments; therefore, the next future research work will focus on manufacturing firms in Rivers state. Furthermore, Future research work will be conducted to examine the extent to which inventory management affect organizational sustainability in manufacturing firms in Rivers state.

QUESTIONNAIRE

Please note: In filling the below questionnaire, the following expressions will serve as a guide; SA= strongly agree; A = Agree; D = Disagree; SD = strongly disagree.

	Aggregate Planning	SA	A	D	SD
	<i>These items were used to evaluate how oil and gas firms in Rivers State plan and evaluate their project.</i>	4	3	2	1
1	My company makes a formal scheduling and process for all activities by incorporating network analysis techniques or other decisions models.				
2	All functions within my organization are planned 'using common schedule to drive project to timely completion.				
3	My company has a need for setting adequate objectives on economic environmental and social performance improvement.				
4	My company uses statistical formulas that incorporate the accuracy of sales forecasts, required production lead times.				
5	My organization takes cognizance of the economic, environmental and social factors in the planning process and decision making.				

MAINTENANCE		SA	A	D	SD
<i>These items were used in decision making concerning maintenance, buying or replacement of equipment.</i>		4	3	2	1
1	My organization makes periodic inspection of the organizational resources.				
2	My organization is effective in tracking how much it costs (Life Cycle Cost) to maintain equipment.				
3	My organization's Production operators and maintenance specialists involved in equipment selection decisions using maintenance /replacement models.				
4	My organization tries to prevent breakdowns and failures from recurring through regular or annual inspections and preventive maintenance.				
5	My organization only has few cases of poor maintenance /replacement problems.				
QUESTIONNAIRE SECTION (C)		SA	A	D	SD
ECONOMIC SUSTAINABILITY (EcS).		4	3	2	1
1	My organization honours the taxes, tributes, fees, and other government contributions that enhances economic sustainability				
2	My organization does not practice disloyal competition, trust, monopoly or dumping on economic sustainability issues.				
3	My organization's economic sustainability decisions are taken based on a formal strategic planning that encompasses the organization as a whole, made by professionals.				
4	My organization focused on risk management plans and evaluations, with concern of the company's capacity to honour financial commitment with collaborators and shareholders.				
5	My company has restructuring plans in case of exceptional events (economic market crash, natural phenomena, etc.).				
ENVIRONMENTAL SUSTAINABILITY (EnS).		SA	A	D	SD
1	My organization has monitoring programmes of environmental performance improvement.				
2	My organization informs its collaborators at all hierarchic levels to contribute to the organization's environmental performance				
3	In my company, the causes of environmental pollution are not intentional.				
4	My organization has a process for adequate disposal of by-products and residues in a manner that does not damage the environment.				
5	My organization has a process for minimizing leaks or spills of substances that are hazardous to the environment.				

SOCIAL SUSTAINABILITY (SS).		SA 4	A 3	D 2	SD 1
1	My organization offers safety conditions and occupational health, minimizing rates of lesions, occupational illness, sick days, days off and deaths related to work.				
2	My organization assists people with special needs, immigrants, minorities, etc.				
3	My organization has a concern with the quality of life of its workers and the society.				
4	My organization communicates social policies to the society collaborators and disseminated through all hierarchical levels.				
5	My company offer free training and education to its workers and the society.				
ORGANIZATIONAL COMPETENCE		SA 4	A 3	D 2	SD 1
1	My company is ardent in technology.				
2	My company trains its staff in acquiring high human capital.				
3	My company focuses on innovation, and creativity that improves organizational knowledge				
4	My company adopts a culture for effective performance of operations management activities.				
5	My company trains its workers or key personnel for effective operations management activities.				

REFERENCES.

- Adams C., & Roberts, C. (1995). *Environmental, employee and ethical reporting in Europe*. London ACCA research report 45.
- Agbola, T., & Olurin, T. (2003). Land use and Land cover change in the Niger Delta. *Excerpts from a Research Report presented to the Centre for Democracy and Development*.
- Aluko, M., Odugbesan, O., Gbadamosi, G., & Osuagwu, L. (2011). *Business policy and strategy*. Department of business administration. University of Lagos Nigeria Longman Nigeria Plc, 180-184.
- Atkinson, P.E. (1990). *Creating cultural change, management services*, 34(7), 6-10.
- Ayuba, K. A. (2012). Environmental Impacts of Oil Exploration and Exploitation in the Niger Delta of Nigeria. *Global Journal of science frontier research environment* & Bontis, N. (1999). Managing organizational knowledge by diagnosing intellectual capital: framing

- and advancing the state of the field, *International Journal of technology Management*, 18(5–8), 433–462.
- Bontis, N. (1999). Managing organizational knowledge by diagnosing intellectual capital: framing and advancing the state of the field, *International Journal of technology Management*, 14(8), 44–46.
- Boschian, V., Rezg, N., & Chelbi, A. (2008). Contribution of simulation to the optimization of maintenance strategies for a randomly failing production system. *European Journal of Operational Research*, 197(3), 1142–1149.
- Brownson, R., & Naadimuthu, G. (1997). *Operations research theory and Problems*, (2nd eds) Schaum Outlines Series McGraw Hill, 3-36.
- Brundtland, G.H. (1987). *Our Common Future. Report of the World Commission on Environment and Development*. From One Earth to One World (online) <http://habitat.igc.org/open-gates/ofc-ov.htm>.
- Callado, A.L.C. (2010). *Modelo de mensuração de sustentabilidade empresarial: Uma Aplicação em Vinícolas localizadas na Serra Gaúcha*. PhD thesis, Post Graduate Program in Agribusiness, Federal University of Rio Grande do Sul, Porto Alegre, Brasil.
- Cella-De-Oliveira, F. A. (2012). *Ecoeficiência: competência para a sustentabilidade organizacional. Um estudo de caso na indústria de acumuladores de energia*. Master's degree dissertation, Post Graduate Program in Business Administration, State University of Londrina,
- Cella-De-Oliveira, F. A. (2013). *Indicators of organizational sustainability: A proposition international review of management and business research*, 2(4). Available at www.irmbrjournal.com.
- Chiapetta, J.C. J., (2013). Environmental training and environmental management of Brazilian companies with ISO 14001. *Empirical evidence journal of cleaner production*, <http://dx>.
- Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests *Psychometrika*, 16(3), 297-334. In Pierro, A. & Kruglanski, A.W. (2015). The effects of altruism and relationship conflict on organizational learning: *International journal of conflict management*: Available at <http://www.researchgate.net/publication/273136821>.
- Dart, J. J., Petheram, R. J., and Straw, W. (1998). *Review of Program Evaluation in Agricultural Extension, Rural Industries and Research Development Corporation*, 98, 136.
- Dekker, R. (1996). Applications of maintenance optimization models: A review and analysis, *reliability Engineering and System Safety*, 51(3), 229-240.
- Dekker, R., & Scarf, P.A., (1998). On the impact of optimization models in maintenance decision-making: the state of the art *Reliability Engineering and System Safety*, 60(2), 111–119.

- Deppelt, B. (2008). *The Power of Sustainable Thinking: How to create a Positive Future for the Climate, The Planet, Your organization and Your Life*. London: Earthscan Publishing.
- Drejer, A. (2000). *Organisational learning and competence development*. The Learning Organization, 7(4), 206-220.
- Dyllick, T., & Hockerts, K. (2013). *Beyond the business case for corporate sustainability, article in business strategy and environment impact factor 11*, 130-141. Published online in Wiley inter science (www.interscience.Wiley.com) Doi:10.1002/bse.323.
- Dyllick, T., & Hockerts, K. (2002). *Beyond the business case for corporate sustainability*. Business Strategy and the environment, 11, 130-141.
- Eden, S. (2001). *Environmental issues. Sustainable progress. Progress in human geography*, 24(1), 111-118.
- Ekwueme, C.M., Egbunike, C. F., & Onyali, C. I. (2013). Benefits fo triple bottom line disclosing on corporate performance: An exploratory study of corporate stake holders. *Journal of management and suitability, Canadian centre of science and education*.3(2), 41-44
- Elkington, J. (1994a). *Enter triple bottom line*, 1-11.
- Elkington, J. (1994b). Towards the sustainable corporation: Win-win-win business strategies for sustainable development. *California Management Review*, (winter), 90-101.
- Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st Century Business*. Gabriola Island: Chapstone Publishing.
- Elkington, J. (1999). *Triple bottom line reporting: Looking for a balance*. Australian CPA, (March), 19-21.
- Epstein, M. J., & Widener, S. K. (2010). *Identification and use of sustainability performance measures in decision-making*. Green leaf publishing limited U. K., 1-16.
- Erumaka, E.N., & Umana, R.A. (2003). *Introduction to business mathematics 2*. Owerri. U&U prints, 127.
- Fauzi, H., Svensson, G., & Rahman, A. (2010). *Triple bottom Line as sustainable corporate performance: A Proposition for the Future*. *Sustainability*, 2(5), 1345-1360.
- Fleury, A., & Fleury, M. T. L. (2006). *Estratégias empresariais e formação de competências: um quebra-cabeça caleidoscópico da indústria brasileira*. (3rd ed.). São Paulo: Atlas.
- Garrison, R.H. & Moreen, E.W. (1994). *Managerial accounting. Concept for planning, control, decision making* (7th ed) Australia. Irwin.
- George, C.S. (1972). *History in management thought*. Englewood Cliffs, Prentice Hall Inc.

- Gray, R., Bebbington, I., & Walters, D. (1993). *The rationality of a safe minimum standard land economics*, 74(3), 287-302.
- Griffin, R.W. (2005). *Management*, (8thed). USA, Boston New York. Houghton Mifflin Company.
- Hadders, F., & Cavaleri, S. (2009). *The adaptive quadruple bottom line scorecard measuring organizational sustainability performance*, Netherland, 1-14.
- Harmon, A.J., Fairfield, K. D., & Behson, S. (2009). *Comparative Analysis of Organizational Sustainability Strategy: Antecedents and Performance Outcomes Perceived by U. S. and Non-U.S.-Based Managers*
- Hatzell, D. (2006). *Educational printing and publishing Academic's Dictionary of Management*. New Delhi Academic Publishers, 32.
- Helleloid, D., & Simonin, B. (1994). *Organizational Learning and a Firm's Core Competence*. In: Competence-based competition, Hamel G, Heene A (eds.). John Wiley & Sons: England.
- Hitt, M.A., Ireland, R.D., & Hoskisson, R.E. (2005). *Strategic management competitiveness and globalization concepts*. Thompson and southern-western.
- Ho, L.C. J., & Tarlor, M.E. (2007). An Empirical Analysis of Triple Bottom-line Reporting and its Determinants: Evidence from the United States and Japan. *Journal of International Financial Management and Accounting*, 12, 123-150. <http://dx.doi.org/10.1111/j.1467-646X.2007.01010>.
- Hollingsworth, M. (2009). Building 360 organizational sustainability. *Ivey business journal*, 1-11.
- Horibe, F. (1999). *Managing knowledge workers*. New skills and attitudes to unlock the intellectual capital in your organization.
- Hubbard, G. (2009). Measuring Organizational Performance: Beyond the Triple Bottom Line *Business Strategy and the Environment Business Strategy Environment*. 18, 177–191
- Huppel, G., & Ishikawa M. A. (2005). Framework for quantified Eco-Efficiency Analysis. *Journal of ecology industrial*, 9(4), 25-4 In Rosen M.A., Kishawy I-LA. Sustainable Manufacturing and Design: Concepts, Practices and Needs. *Sustainability*, 4, 154-174.
- Jaja, S. A., & Obipi, I.Z. (2005). *Management; Elements and theories* (2nd Ed.). Port Harcourt, Nigeria. Pearl publishers, 29-31
- Jamali, D. (2006). Insight into the triple bottom line integration from a learning organization perspective. *Business process management journal*, 12(6), 809- 821.

- Kalua, A. (2015). Economic sustainability of green building practices in least developed countries. *Journal of civic engineering and construction technology*, 6(5), 71-78. doi.105897.
- Kerzner, H. (2003). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling (8th ed.)*, Wiley. ISBN 0-471-22577-0
- Koontz, H., Cannice, M., & Wehrich, H. (2011). *Management, A global and entrepreneurial perspective*, (13 eds) New Delhi.Tata, McGraw-Hill, Education private limited, 475-484.
- KPMG. (2002). *Triple bottom-Line reporting: KPMG Guide to Producing an Annual Report*. Auckland, New Zealand: KPMG.
- Krejcie, R.V. & Morgan, D.W. (1970). *Determining sample size for research activities. Educational and psychological measurement*, 30, 607-600.
- Kumar, S.A., & Suresh, N. (2008). *Production and operations management (with skill development, caselets and cases) (2nded)*. New Delhi, New Age International (P) Limited Publishers, 92-94.
- Likert, R.L. (1967). *The human organization*. New York. McGraw Hill book.
- Lorenzetti, D. H., Cruz, R. M., & Ricioli, S. (2008). Estr ategia empresarial e sustentabilidade: um modelo integrador. *Revista da P os-gradua o: Administra o Osasco*, 2(3), 33-57.
- Lung, B., & Levrat, E. (2014). *Advanced maintenance services for promoting sustainability*. Elsevier, 22, 15-22.
- Mac’ Odo, D.S. (2005). *Fundamentals of production/operations management*. Port Harcourt. Pearl publishers.
- Maitland, A., & Chapman, M. (2014). *Oil spills in the Niger delta: Proposals for an effective non-judicial grievance mechanism*. Justice and empowerment initiative –Nigeria produced for stakeholder democracy network (SDN) under the *compensation rates and processes* project.
- McElroy, M. (2008). *Social Footprints: Measuring the Social Sustainability Performance of Organizations*. PhD Thesis. Groningen: University of Groningen.
- McEntyre, R. (2003). *Triple Bottom Line and the Community Library*. Available at www.mcentyre.com.au/articles/triple-bottom_line.pdf
- Medugu, N.I. (2012). *Issues and challenges crude oil exploration, exploitation and production in Nigeria*.
- Mills, J., Bourne, M., & Richards, H. (2002). *Competing though competences*. Cambridge: Cambridge University Press, 8-27

- Moneva, J. M., Archel, P., & Correa, C. (2006). *GRI and the camouflaging of corporate unsustainability Accounting Forum*,30, 121-137. Available online at www.sciencedirect.com .doi 10.16/J.accfor.2000.
- Moure-Eraso, R.C., & Coletiva, S. (2003). *Development models, suitability and occupational and environmental health in the Americas*; Neoliberals' versus sustainable theories of development. USA. 8(4), 1039-1046.
- Mullins, L.J. (1999). *Management and Organizational behaviour* (5th eds) China: Financial times Prentice hall. Pearson education
- Munk, L. Dias, B. G., & Borim-De-souza, Rr (2012). Competences for organizational sustainability: *A proposal for an analytical tool for assessing eco-efficiency. Society for business dynamics. 1*(9), 30-43.
- Norman, W., & MacDonald, C. (2004). *Getting to the bottom of the triple, Business Ethics Quarterly*,14(2), 243-262. <http://dx.doi.org/-10.5840/beq2004.14211>
- Nunnally, C.J. (1978). *Psychometric theory*. New York. Mc Graw- Hill
- Ogbomeh, B.A., & Atubi, A.O. (2010). *The role of oil Industry and the Nigerian State in defining the future of the Niger Delta region of Nigeria*, 103-112.
- Ogbonna, G.N., & Ebimobowei, A. (2012). Impact of petroleum revenue and the economy of Nigeria. *Current Research Journal of Economic Theory*,4(2), 11-17.
- Petrini, M., & Pozzebun, M. (2010). Integrating sustainability into business practices: Learning from Brazilian firms. *Brazilian administration Review. 4*(3), 362 – 378. Available online at <http://www.anpad.org.br/bar>.
- Picher, R. (1992). *Principles of construction management* (3rd eds) McGraw Hill. International Limited.
- Prajogo, I.D. & Goh, M. (2005). *Impact of operations management activities on operational performance in service organizations*. Business and economics, 1-4.
- Quick, J.C., & Nelson, .L. (2003). *Organizational behaviour foundations realities and challenges (4th Eds.) United State of America: Division of Thompson learning*.
- Robbins, S.P. & Coulter, M. (2013). *Management. (11th eds)* New York. Horizon education. Pearson.
- Robbins, S.P., Judge, T.A., & Vohra, N. (2011). *Organizational behavior*. India, (14theds), Prentice Hall, Pearson Education, 20-22.
- Rogers, M., & Roberta, R. (2001). *The triple bottom line for sustainable community development. Local environment*, 6(3), 279-289.

- Ronen, S. (1986). Organizational studies. The merits of the blunt approach..*Academy of Management Review, New York, 11(4)*, 860-863. <http://www.jstor.org/stable/258403>.
- Rosen, M.A., & Kishawy, H. A. (2012). *Sustainable manufacturing design concepts, practice s and needs. Sustainability*, 154-173.
- Savitz, A.W., & Weber, K. (2007). *The triple bottom line: how today's best-run companies are achieving*. John Wiley & Sons Inc.: San Francisco.
- Schaltegger, S., & Wagner, M.S. (2006). *Managing sustainability performance measurement and reporting in an integrated manner*”, Sustainability accounting as the link between the sustainability balanced scorecard and sustainability reporting. In S. Schaltegger, & M. Bennett, & R. Burritt Ed.), *Sustainability accounting and reporting*, Dordrecht: Springer, 681-697.
- Schaltegger, S., Ludeke-Freund, F., & Hansen, E. G. (2011). *Business cases for sustainability and the role of business model innovation. Developing a conceptual framework. Centre for sustainability management (CSM) Leuphana*, 1-13.
- Sharma, J.K. (2013).*Operations research, theory & practice*. (5theds.) India. Amitabh Nagpal Macmillan Publishers India, 16, 17.
- Spangenberg, J.H. (2005). Economic sustainability of the economy: Concepts and indicators. *Management Journal of sustainability and development*,8(1), 47-64.
- Stavins, R.N., Wagner, A.F., & Wagner, G. (2003). *Interpretingsustainability in economic terms: Dynamic Efficiency plus Intergenerational Equity*. *Economic Letter*, 79(3), 339-343.
- Sveiby, K. E., (1997). The intangible asset monitor. *Journal of Human resource Costing and Accounting*, 2(1), 73-97.
- Taha, H., (2007). *Operations research. An introduction*, (8theds) USA, Prentice Hall. Pearson Education inc., 1-10.
- Thayer, R.H., & Yourdon, E. (2000). *Software Engineering Project Management (2nd Ed.)*. Wiley-IEEE Computer Society Press.
- Umoh, G. I., (2012). *Quantitative analysis for business decision and modeling*. University of Port Harcourt Press, 99-118.
- UNDP, (2009). *Hand book on planning, monitoring and evaluating for development results. United Nations development programme*. Available at <http://www.undp.org/handbook>.
- Vasili, M. Hong, T.S., Ismail, N., & Vasili, M. (2011). Maintenance optimization models: a review and analysis. *International conference on industrial engineering and operations management*. Kuala Lumpur, Malaysia, 22 – 24.
- Wang, L., & Lin, L. (2007). *A Methodology framework for the triple bottom line accounting and management of industry enterprises, international journal of production research*, 45(5), 1063-1088.

Wentworth, J. (2012). *The parliamentary office of science and technology*. Mill bank London.
www.parliament.uk/ post number 408.

Yusliza, M. Y., & Hazman, S. A. (2008). HR Roles and Empowering the Line in Human Resource Activities: A Review and a Proposed Model. *International Journal of Business and Society*, 9(2), 9-19.