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Enhancing Lean Interventions through the use of Systems Thinking in the food production industry: a case in the Niger Delta region, Nigeria.

By

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Dedication

To God the almighty

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Abstract

This research discusses how Lean Thinking (Lean), can be enhanced through the use of Systems Thinking (ST) tools and methodologies. While Lean has emerged as a process improvement philosophy aiming to enhance value by identifying and eradicating waste through the use of various tools, Systems Thinking seeks to recognise the impacts of different parts that function together in an operational process, paying attention to boundaries, interrelationships, perspectives and how systems function as whole.

However, the extant literature shows that Lean tends to focus on narrow stakeholder input, leaving out the impact of the operational process on other affected stakeholders who may be affected by the system but are not directly involved. Such a narrow view can have an impact on Lean implementation and adoption among practitioners in modern businesses, and on its success in improving processes and sustaining changes. There can be challenging impacts on stakeholders, such as 'end to end' effects, which pose an issue to the general acceptance of the approach by affected stakeholders.

To address this gap, the application of Systems Thinking alongside Lean was adopted, as Systems Thinking seeks to explore impacts on the affected. This led to the development of a Systemic Lean Intervention (SLI) methodology, involving the combination of Lean and Systems tools, to form an approach to identify and address the issues of waste and value development from the perspective of wider stakeholders.

The research looks at a case of a commercial live-stock farm in the Niger Delta region of Nigeria. Qualitative data was collected from the identified stakeholders who participated in the research process.

One of the findings was that SLI can assist in securing wider stakeholder acceptance of Lean and Systems improvements. However, the research also highlighted constraints on the SLI application, including the autocratic leadership style adopted on the farm and boundary rigidities in decision making, which hindered effective team play. Finally, among other limitations highlighted in the research, it was noted that the SLI approach

would require significant time to be learned in the particular context of the Niger Delta Region, where the practice of both Lean and Systems were found to be relatively new.

1 Chapter One: Introduction

1.1 Introduction

This chapter presents a general introduction to this research on enhancing Lean interventions through the use of Systems Thinking. The Chapter also specifies the main objectives and the questions raised in the research, plus the approach taken.

1.2 Justification for the study

Process improvement has been at the forefront of both academic research and Managerial practice (Harrington, 1991; Goldratt et al, 1992; Hanna et al, 2000; Bhatt, 2000; Adesola and Baines, 2005; Ite, 2007; Eugenia, 2009; Ringim et al, 2011; Mmom and Igbuku, 2015). Organisations keep searching for better approaches to achieve certain operational goals such as efficient resource management, reduction of waste, prompt effectiveness in meeting customers' demands and the wish to address other environmental issues, such as host community demands, security challenges and delays in arrival of vital logistics materials. Similarly, the search for better operational effectiveness has become a dominant practice in African countries, especially Nigeria (see, Osagshae, 1995; Frynas, 1998; Oni and Ayo, 2010; Aghedo, and Osumah, 2014; Ekanem, and Inyang, 2014). While other parts of Nigeria play host to different organisations operating in different industries, the Niger Delta region is held unique both by the government agencies and the private sector due to its host to different multinational Oil firms who are interested in the huge oil deposits found in the region. This tended to open up the economy of the region for further development. As a result, many

other related organisations from other industries, such as food production, have become attracted to situating their operations in the region.

In particular, the choice of the food production industry is because of the keen national interest of both the public and private sectors in achieving food security. The industry is also recognised to have provided source of employment for many in the Niger Delta region and other parts of the country, lending immense support to regional economy development (Olomola, 2007; Phillip et al, 2009).

However, due to conflicts between these organisations and the stakeholders in the region, there is a continuous search for appropriate means to address emerging operational and stakeholders' issues (see, Frynas, 2001; Omeje, 2006; Idemudia, 2009).

The aforementioned challenges could lead to business failures, conflicts among stakeholders, unfulfilled demands and overall dissatisfaction, especially among Nigerian business practitioners in the Niger Delta region where this work is based (see, Ikelegbe, 2005a; Hanson, 2007). To address these issues, organisations have adopted different philosophies and practices, such as Corporate Social Responsibilities, Conflict Management Initiative, and Stakeholder Consultation Approaches (Adeleye et al, 2004; Frynas, 2001;2005; Liyanage and Kumar,2003), which had led to some level of successes on incremental basis, among these organisations. This is due to the fact that they strive to maintain the sustenance of the operational system (e.g. increase turnover, build customer loyalty etc), for the future. Pedersen and Huniche (2011), commenting on the importance of stakeholders consultation in an operational process, noted that it requires negotiations with relevant associates, in a business environment, with the aim to sort

out ambiguities and enhance business process. These writers anchor their argument on the fact that such stakeholders practice, could address emerging operational challenges such as, operational shut-down which had formed a trend of experience among organisations in the Niger Delta, leading to massive waste of both human and capital resources, time, and other issues, such as customer turnover (see, Ikelegbe, 2005b;Watts, 2007). It would also enhance the recognition of the various perspectives of the affected stakeholders and enforce a genuine representation of their interests in the operational processes among practicing organisations. This would project a research process that seeks to consider and address the welfare of the affected stakeholders identified, while the organisation pursues its operational aims and objectives (see, Midgley, 2000).

On the other hand, there also seems to be a significant level of systemic hindrances (for instance, negligence of stakeholders' perspectives and assumption, delays in material supply- leading to operational down time), needing more attention from practitioners who need to develop appropriate operational models that provide systemic solutions to the emerging complexities faced by firms in the region (see, Boele et al, 2001; Amaeshi et al, 2006). The issue of negligence of some of the stakeholders' interest which tended to ignite conflict between some of the affected stakeholders (i.e. those who may not be directly involved with the operations of these organisation), and the organisations. The involved stakeholders are refers to stakeholders in this research process who participate in the operational process. (E.g. the suppliers, the internal organisational staff, top management). The affected stakeholders are those who may not be directly involved with the daily operations of the operational process but are also affected by the operational process (e.g. the host community, the government agency). The affected stakeholders are sometimes

referred to as the concerned stakeholders in this research process. This forms a moral basis for the need for adequate attention from among researchers and practitioners to facilitate smooth operational process and harmonious relationships between organisations and these stakeholders[1].

Researchers (e.g. Adegbite, 2001; Nworji et al, 2011), have suggested critical assessment of the business environment to ascertain what would be needed to enhance effective corporate governance both in the production and services sectors. They observe that such could offer the needed support for internal process improvement that could stand a chance to continually meet the expectations of the stakeholders, which is paramount for long term sustenance. Part of their emphasis is the out-sourcing of main business operational activities in order to effectively spread out the risk involved, especially that of security, due to frequent challenges of criminality, posing inherent danger to life and causing breaches to free flowing operational processes (Omeje, 2004; 2006). This advocate of environmental assessment notes that proper application of its principles could help organisations build their survival strategies in the region (see, Adeleye et al, 2004).

Business practitioners in the region seem to recognise the importance of stakeholder involvement in their operational process, as a medium to developing an insight into their environment. This helps organisations develop appropriate understanding of the demands of these stakeholders from the organisation as well as make them become aware of the challenges there are in their operating environment. For instance, Aruoma (2006) emphasises the need for streamlined government regulations in the food

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[1]See section 2.7 and Chapters3, 4, 5 and 6 for further details about stakeholders' participation in this research.

production industry to ensure the supply of healthy food products to the market and control the influx of substandard food materials to the market.

Amongst the approaches to address operational challenges and efficiency is Lean thinking, which has become popular among scholars, especially in non-African contexts (Bhasin and Burcher, 2006; Gregory, 1992; 1996; Hines at al, 2004; Shah and Ward, 2007; Wan and Chen, 2008; Womack et al, 1990; Holden, 2011; Piercy and Morgan, 2015). Lean is in sharp contradiction of the former mainstream operational practices, associated with minimal human resource interference (see Brown et al, 1988; Emiliani, 1998; Taylor, 1967; Wild, 1989; 1998). A common factor attributed to the use of Lean is the enhancement of operational processes, aiming to achieve value development in an operational system. The basic idea is to achieve more value, but by using fewer resources (Radnor et al, 2012; Womack et al 1990; Womack and Jones, 2003; Jorgensen and Emmitt, 2008), and value should be seen from the perspective of the customer. The latter is said to have minimum tolerance towards non-value adding activities, referred to as waste in the operational process. Therefore, Lean involves the identification and eradication of waste to enhance value and achieve customer satisfaction (Womack et al 1990; Womack and Jones, 2003; Slack et al, 2007).

However, extant literature (e.g. Womack et al, 1990), tends to show that Lean has a significant weakness, in the sense that its approaches recognises only narrow stakeholder's involvement, covering the internal organisation members, the input of suppliers and mostly aiming to satisfy the customers. If other stakeholders are influential, it may fail to address their issues. Others (e.g. Towill and Christopher, 2002) note that Lean may be ineffective in an environment where there may be relative instabilities. This is a common factor in the Nigerian context, where the operational

challenges can often appear to take the form of 'wicked problem' situations – with high levels of complexity, many connected parts that are unpredictable, stakeholder conflict (see, Rittel and Webber, 1973; Jike, 2004; Grint, 2005; Watt, 2007; Enuoh and Inyang, 2014; Nwagbara, and Brown, 2014; Zabbey et al, 2014).What could be an idea Lean process would be an approach that give a comprehensive recognition to these complexities, noting the extent to which the stakeholders are affected and jointly developing solution to bordering issues. Whilst this would mean the emergence of complexities that may go beyond the potentials of Lean approach, that would require a combination of ideas and methods, coupled with the involvement with different stakeholders to effectively address. A natural step towards effective Lean operations would require a cross-organisational interactions that would go beyond the intra organisational stakeholders or the immediate supply chain partners (e.g. suppliers, end customers), to the operational process, to include the affected external and internal stakeholders to the operational process (see, Brandao de Souza, 2009).

Schoderbeck et al (1985) defines complexity of a system as the outcome of the interactions of the elements that comprise the system and the rules guiding the interactions or specifying the attributes. It has a number of connectivity, comprising non-linear relationships, displaying evidences of difficulties in separating these connecting activities within the system (Richardson and Lissack, 2001).

The disclosure of relevant facts, specialisation, and the adoption of a value adding approach are key requirements for resolving complexities. While these factors seem to provide an expert approach, the identification and involvement of the affected stakeholders, recognising their varied perspectives in the research process, based on the context (Warfield, 1991; 1999).

This narrow stakeholder view and the failure to adequately address emerging complexities in the operational process, portrayed as weaknesses of Lean, led to the search for another approach to partner Lean in this research. Systems Thinking appears like a good candidate because some of its methodologies explicitly address wider stakeholder participation (e.g., Ulrich, 1983; Midgley, 2000) and it is common to find Systems Thinking being described as an approach that is useful in addressing wicked or highly complex problems (Buchanan, 1992; Sterman, 1994; Barry and Fourie, 2001; Jackson, 1991; 2000; 2003). Such an attempt would enhance effective connectivity within and between the organisation and its environments – both internal and external. In other words, the use of System thinking would enhance Lean to create a flexible operational approach that could facilitate the achievement of the needed productivity in the entire process, including addressing external stakeholder and other complex issues.

Systems Thinking focuses on examining interactions between different parts of an operational process that function to produce behaviour (Aronson, 1996). It recognises the perspectives of different boundaries, exploring the interconnectedness of different parts, seeking to develop an approach which considers these variations to produce a course of action that addresses identified issues (Cabrera et al, 2008). The adoption of Systems approach in combination with Lean could recognise the potential relevance of the connectivity of every part of the operational process with the environment, and the importance of stakeholders who are affected as well as involved, producing a systemic operational process that seeks to meet the expectations of a wide variety of stakeholders (Jackson, 1991; Midgley, 2008; 2011). This research therefore adopts a wider stakeholder approach that includes the identification of affected stakeholders in the research process than Lean alone. It would arguably propel the consideration of

stakeholders' perspectives, and the formation of an approach from Lean and Systems Thinking. It would provide the needed opportunity for the involvement of those who are directly affected, as well as those that may not be directly involved but are affected by their operational process, in the intervention. It could also create a resilient medium to address emerging issues of interests that could have resulted to disagreement among participants in the research process, especially on the way and approaches to address identified issues in the research process. Furthermore, combining Lean with Systems approaches could offer an advantage in terms of embracing the basic attributes of Lean by the participants in an environment where the practice of Lean with Systems seems to be unpopular among researchers and practitioners (see; Gregory, 2007; Seddon and Caulkin, 2007; Seddon, 2008). However, apart from few exceptions (e.g. Gregory, 2007; Seddon, 2003), detailed applications of Systems theories tend to be scarcely used among Lean authors. The findings of these authors differ from this research in the sense that their works were based on quite uniform applications in the public service sector and in the Western cultural backgrounds. This research uses wider stakeholder involvement and focuses on organisational issues in the Niger Delta region, Nigeria.

1.3   Research Aim

This research work is set out to develop and implement a new operational approach that seeks to achieve internal operational effectiveness in the food production industry in the Niger Delta region, while minding the effects of adopted operational practice (Lean and Systems), on the immediate environment and the concerned stakeholders. This informs the choice and implementation of Lean and Systems tools to identify and address operational issues in the industry. It seeks to recognise and consider the influences and contributions of the affected stakeholders in the research process.

1.4   Research Objectives

The research is to achieve the following objectives:

1. To combine Lean and Systems tools to identify operational issues and the concerned stakeholders in the operational process of firms in the food production industry, in the Niger Delta region.

2. To involve concerned stakeholders in the development of approaches to addressing identified operational issues, seeking to identify the impacts on these stakeholders, as well as jointly explore further possible benefits from the operational process

1.5   Research Questions

The following questions are set to guide the entire research work:

*   How could Lean and Systems approaches be applied together in order to improve organisational processes in the food production industry in Nigeria?

*   How can the philosophy of Lean be enhanced with the use of Systems approaches to address systemic issues within and beyond the organization in focus?

*   What are the challenges associated with this use, and what do these suggest by way of further research?

The first question focuses on the combination of Lean and Systems. This will involve the recognition of the context of the Niger Delta, where this research is based, and also view the impact of the environmental forces and the contribution of the affected

stakeholders that could be identified. These would make the findings to be adaptable among practicing firms in the region as well as contribute to learning among researchers. The second question aims at addressing the theoretical impacts of the proposed combination of Lean and Systems. The third question refers to the challenges and limitations that may be encountered in the process of combining the two approaches in the research process. It would possibly form a foundation for further development of learning on Lean and Systems, especially in the context of the Niger Delta.

This research applies a case study intervention involving the identification and involvement of the stakeholders who are affected, in the process of implementing Lean and Systems Thinking. The research explores how Systems approach can help Lean explore operational complexities in the Nigerian context, as well as to facilitate active stakeholder involvement among practicing organisation in the Niger Delta region. Such practices will add to a structured approach meant to address complex operational issues that may be identified within the process of improving on current operational practices via the use of Lean (see, Clark et al, 1998). This argument suggests that implementing Lean and Systems could also facilitate effective learning across cadres of the entire Food production Industry in the Niger Delta region. Such could possibly be pioneered by the findings of this research process.

1.6   Research Strategy and methodology

To answer the research questions, this research is set out to combine Lean and Systems to address the operational challenges faced in the Niger Delta region. It aims at assisting organisations with an approach to develop further and improve on their relationship with the business environments, focusing on the interests of those stakeholders that are

not just relevant to but are either involved or affected by the operational process. This includes the identification and involvement of these stakeholders in the research process, via the application of Lean and Systems tools such as boundary critique and CATWOE, rich pictures, value stream mapping, rapid improvement and waste identification events in the research process.

The research adopts an action research approach, which is based on the views of participants, on the ways to improve the current practice of the operational system of the case study organisation, in the food production industry in the Niger Delta region (see Kesby, 2000; Percy, 2005). While action research forms the background for triggering actions and interactions between stakeholders groups (see, McNiff, 1998; Franco and Montibeller, 2010), the use of Lean and Systems would present a set of tools that would be applied in the intervention process (see chapter 3 and 6 for more details). Authors (e.g. Mingers, 1992; Midgley, 2000) point out that sometimes it is difficult to establish a clear boundary distinguishing the conceptual and real world situation as suggested by authors (e,g,Checkland 1981; Checkland and Poulter, 2006;Yolles, 2010; Rajagopalan and Midgley, 2015), due to complex contextual issues that shape a research process. This research focuses on generating rigorous data and achieving adaptable findings that reflect the context of the Niger Delta region.

Different data collection methods would be applied for the identification of different stakeholders in the research process as well as the collection of qualitative data. These include observations, personal interviews and workshops. The application of set boundaries would project fairness in the research process, ensuring that representation of the perspectives of the participants, their choices and their preferences in the research intervention process. Midgley (2000) defines intervention as a purposeful action by an

agent/s to achieve a change. It is also intended to avoid making the entire research become expert driven (i.e. not restricting the participants to expert ideas and dictation), by allowing the identified participants the free opportunity to make their contributions in the research process, while the researcher attempts to be part of the intervention process (see, Midgley, 2000; Franco and Montibeller, 2010; Ufua et al, 2014).

The methods applied in the intervention process are to be duly evaluated, via the use of developed evaluation questionnaire to be completed by the participants in the intervention process. It will be based on their assessments on the potencies of the various tools and methods from Lean and Systems in achieving the purpose of the research process. The evaluation therefore focuses on what worked well and what did not in the combination of the Lean and Systems tools, from the perspectives of the participants in the research process.

Collected data would be analysed manually for interpretation. An iterative process of sorting collected data into relevant themes would be followed by a refined coding process, leading to further detailed analysis, based on extant literature on Lean and Systems. More of this is presented in chapter six.

1.7 Brief overview of the Thesis

This research is divided in to chapters, as briefly explained as follows

Chapter two –Review of the literature on Lean and the need for Systems Thinking
This chapter provides reviews from relevant literature on Lean from different perspectives and contexts. It highlights the different tools and the challenges as well as the practice of Lean in different industries. The chapter also discusses about stakeholder

management and impacts on Lean practice as documented in literature. It also provides details on the relevance of systems approach in this research based on existing literature.

Chapter three - Methodology: The chapter discusses the various methods and strategies applied in the research process. It presents the data collection methods and analysis as well as justifies the research strategy of a single case study. It also discusses various Lean and Systems tools applied in the research process.

Chapter four- Report on the process of Intervention on the Application of Lean and Systems tools: a Case in the Niger Delta Region of Nigeria: This chapter provides a brief history of the case study organisation and its operational structure. It also details the data collection process and the involvement of identified stakeholders in the research process**.** It also presents the various Lean and Systems changes suggested by the participants in the intervention process.

Chapter Five- critical Evaluation of the Intervention Process: This chapter presents a critical evaluation of the data collection process. It examines the usage and combination of the various Lean and Systems tools applied in the research process based on the methods and the approaches applied in the research process.

Chapter Six - Discussion: The penultimate chapter provides further discussion of the impacts of the organisational and environmental contexts on the implementation of Lean and Systems, as well as the impacts of stakeholder involvement at different points in the research process. This would inform the joint development of Lean and Systems change models, through a participatory approach, to addressing the identified issues in the research process.

Chapter Seven - Conclusion: This presents a reflection on the impact and the core findings of the entire research process, in relation to the objectives and questions raised in this research. It also highlights the various limitations of this research process and provides suggestions for future research that could facilitate the further development of Lean Systemic Intervention in the Niger Delta region.

2   Chapter Two: Literature Review on Lean and the Need for Systems Thinking

2.1   Introduction

It seems that the search for an effective operations management approach has remained a popular topic debated among business commentators before and after the invention of Lean. The popularity of Lean philosophy appears to have followed a continuous trend of development of different approaches at different times to address the need for effective operational process. Practicing organisations seek to source and use resources and interact with other firms, to meet market requirements. This chapter reviews existing literature on the practices of Lean philosophies in both developed and developing countries. It seeks to review literature on Lean operations from the different stakeholders' perspective as well as the current issues in the Nigerian context, where this research work is based.

This chapter is structured as follows: This first part discusses the meaning and characteristics of Lean. It details Lean as a philosophy, highlighting its main tools. This part also discusses Lean as an organisational culture, identifying the approaches to its practices. It discusses Lean in the service sector as well as other relevant operational models that are related to Lean practices and development. The chapter highlights the main criticisms of Lean based on literature, and provides a critical reflection on Lean.

The second part of the chapter discusses the justification for the use of Systems Thinking alongside Lean, detailing the development of Systems Thinking and its relevance to enhancing Lean operations. This is followed by a narrative on the factors that influence business operation in Nigeria, narrowing it down to the Niger Delta region where this work is based.

Finally, the chapter ends with a summary, restatement of the research gaps and presents a link to the next chapter.

2.2   What is Lean?

Despite being identified as a popular business operational paradigm, commentators argue that a consensual definition of Lean is yet to be achieved in the literature because of diverse interpretations among academics and practitioners from different backgrounds. Authors define a paradigm as a set of assumptions about the social world, which guides people's understanding and approach to an activity or investigation (Mingers and Brocklesby, 1997; Jackson, 2003; Punch, 2005; Collis and Hussey, 2009). The lack of a concise definition is evident from the multiplicity of descriptions and terms used with respect to Lean operations management[2] and the fact that it has continued to develop further in different sectors where it has been implemented. This could be because Lean operation has evolved over a long period of time and practitioners have chosen to describe it based on their different experiences in practice (Hines at al, 2004; Shah and Ward, 2007; Wan and Chen, 2008). Wan and Chen (2008) refer to the process of achieving Lean objective in an organisation's operating system as "Leanness" (pg6569). These commentators suggest that Lean has been described in various forms but the end meanings seem to be same; which is to strive to use fewer management operations to move the enterprise to a state of minimum resources and maximum performances (see, Paez et al 2004).

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[2] A business operational system is the chain of value adding activities carried out at different stages in an organisation operations, to bring product or service from raw material state to the provision of final customer (Walters and Lancaster, 1999).Similarly, Amoako-Gymampah and Boye (2001) define operational strategy as the involvement of specific strength based on the operations function aimed to help an organisation reach it set operational process objectives.

Some authors have advanced some definitions of Lean in their research. For instance, Womack et al (1990) and Womack and Jones (2003) view Lean as a business operational practice meant to generate value in an operational process, in the exact form required by an identified customer with minimum tolerance to non-value adding activities, referred to as waste in the operational process.

Lean authors usually refer to waste as 'muda' (in Japanese language), which is defined as non-value adding activities in an operational process which the customers are not willing to pay for at a particular point in time (Rother and Shook, 1999; Sivilotti, 2009; Womack and Jones, 2003; 2010). While this is accepted as the definition of waste in this research, it would also be in place to acknowledge the difficulty involved with the task of arriving at an all-round definition among authors.

Furthermore, Lean is about setting operational process objectives to create value, from the perspective of the customers and the alignment of the organisational processes in a way that best meets these objectives (Slack et al, 2007). Lepak et al (2007) recognise value creation as a central focus of management operations but acknowledges the complexities involved in arriving at an acceptable meaning of value at a given point in time. This, they say, could be due to the fact that different stakeholders to an operational system attribute meanings to value in different ways. This tends to suggest that contextual influences may affect the meaning of value to different stakeholders. These include the immediate environmental issues that can have influence on what is judged to be 'value' at a given point in time (see, Vargo et al, 2008; Edvardsson et al, 2011; Storbacka et al, 2012).

In their work, Bowman and Ambrosini (2010) advise Lean managers to engage in meaningful activities to create and preserve value in their operational process, they caution on the need to avoid all activities that can destroy the value and utility of their operational process, which are referred to as waste.

Having discussed the essence of Lean, which is anchored on operational process value creation and elimination of waste, the next section will trace its development.

2.3   History of Lean operations

Business operations management has passed through several development stages in response to changes in the operating environments (Brown et al, 1988). Duguay et al (1997), tracing it back to the nineteenth century, note that they emerged in America in the aftermath of the industrial revolution (1770-1800). There has been a continuous development and implementation of suitable operational models before Lean was developed. Some of these models are reviewed later in this chapter include, mass production and scientific management.

Kundu et al (2011) point out that, among other reasons, the invention of Lean was meant to achieve a more effective and efficient operational process which they observe was arguably missing in the other popular operational philosophies such as the mass production, at the time Lean was first developed. Pennings and Goodman (1977) define efficiency as an input-output comparison which permits the assessment of the use of resources. Effectiveness refers to an absolute level of attainment; either in the acquisition of input or the achievement of a given level of output from an operational process. It is the achievement of the desired outcome in an operational system of an

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organisation; mainly to meet the expectations of the customers, via effective operational practice that seek to identify and eliminate waste (Galloway et al, 2000).

Stafford Beer provides an approach to effectiveness and efficiency in an organisational systems. He developed the use of the Viable Systems Model (VSM) which applies the concept of recursiveness to view the organisational systems and their various parts. Beer believes that the VSM is made up of parts, and that the viability of each of the parts can be understood in the same terms as the viability of the whole. In other words, the practice of recursiveness both in the whole and its various functions would ultimately result to effectiveness and efficiency (Beer, 1979, pg73; Beer, 1985; Ulrich, 1994, pg347, Jackson, 2000; 2003). (See section 2.14 in the later part of this thesis for more details).

 Ostroff and Schmitt (1993) observe that efficient organisations are mostly recognised by their actions towards achieving set goals. It is about achieving desired output levels from an operational system at the lowest level of cost input (Galloway et al, 2000). Efficiency, according to some commentators on Lean practice, is about appropriate use of available resources to produce value that can satisfy the identified customers' needs. However this raises the question of whether customer satisfaction alone can enhance long term sustenance of business operational system. This also highlights the difficulty in arriving at a stable expectation due to changes in the influencing factors, such as tastes and preferences among the different stakeholders which tends to jointly determine the level of stakeholders appreciation of an operational systems (see, Lepak eta al, 2007).

Defining these terms has stimulated a prolonged debate among Lean authors about the subject of Lean both in theory and practice, seeking to develop its approach further, to suit the different contexts under which is it practiced (see; Womack et al, 1990; Sanchez and Perez, 2001; Pederson and Huniche, 2011).

Atkinson (2010) shares the understanding of Lean authors, noting that the pursuit of efficiency or waste elimination would leave the Lean manager with the task of raising critical questions about the most suitable mechanisms to reinforce work effort across departmental boundaries. This is to enhance the spread of waste elimination around the operational process of an organisation, and strive to ensure absolute discipline in the effective use of available resources. It also seek to achieve a complete avoidance of waste at any point on the operational process. Ostroff and Schmitt (1993) argue that an effective and efficient organisation should be characterised by a positive internal operational structure which encourages participation in the operational decision making, in line with laid down rules that can lead to high turnover from the use of resources, aimed at achieving set objectives. Atkinson (2010) also points out that the task of efficiency, waste elimination and productivity are an ongoing exercise and requires the continuous review of decisions and actions of Lean practitioners in order to enhance an enduring success.

Moreover, Singh et al (2009) recognise that Lean, if effectively implemented, can serve as a strategy for enduring hard economic times as it originally aims to produce a larger variety of products or services without compromising quality, and at lesser cost and other resource input; compared to other operational models such as mass production. S/he reckons that such strategic advantage could be achieved via the instrumentality of value stream mapping, which would help create a better understanding of the flow of

activities with a Lean operational process and help highlight effective improvement on their deliveries (products or services), to meet customers' expectations (see, section 2.6.3 on this chapter). Chen and Meng (2010) remind practitioners that a successful Lean foundation, in most cases, may require an enduring commitment of resources to ensure suitable adaptation that enhance the needed potentials for anticipated success in the long run. Katayama and Bennett (1996) point out that in some instances, this can lead to better customer satisfaction and provide the opportunity for the Lean organisation to widen its market share. Arguably, the extent of customer satisfaction could depend on the prevailing business environments that influence the Lean operational process and stakeholders' judgement (on issues such as what could be termed satisfactory operational practice), at a given point in time, which Lean tended to embrace in its practice (see, Bouton, 2002; Bhasin, 2012).

Efficiency was a popular measure among production organisations, even prior to the advent of Lean. For instance, mass production has been viewed as an efficient operational model, invented in the 18th century. It is a method of producing goods in large quantities at low cost per unit. Mass production, although allowing lower prices, does not have to mean low-quality production; instead, mass-produced goods are standardized by means of precision-manufactured, interchangeable parts. The mass production process itself is characterized by mechanization to achieve high volume-the level of output produced from an operational process at a given time (Slack et al, 2007). It emphasises on organization of materials flow through various stages of manufacturing, underpinned by careful supervision to achieve customer standard products and services (see, Womack et al, 1990; Duguay et al, 1997; Hu et al, 2005). These authors observe that an early focus was mass production characterised by

division of labour- interchangeable operational parts and mechanization. And this practice formed a foundation for the development of other models, such as Lean, in the later days of operational process development.

Furthermore, Papadopoulou and Ozbayrak (2005) recount that, before and during World War II, the fierce competition in the American production industry, coupled with growing market demands, led to the adoption of mass production by companies at that time. It focused mainly on the massive production of standardised goods and high levels of inventory, especially work-in-progress (Tan, 2001), and this permitted long production runs using standard designs, offering less variety to the market (Melton, 2005). Variety refers to the range of different products or services produced from an operational process at a given point in time. It is a key characteristic that determines operational process behaviour in terms of range of values created to satisfy customers. It is a key characteristic that it focuses on the range of values created to satisfy customers (Walters, 1991; Towill and Christopher, 2002; Slack et al, 2007).

The Mass production system was later modified in America through the innovations of production process improvement, such as the moving assembly line, which was developed at the Ford automobile company. The American automobile manufacturer Henry Ford designed an assembly line that began operation in 1913. The result was a remarkable reduction of manufacturing time. This success stimulated the replacement of the old system of production, which was dominated by skilled manpower input to automated systems. Ford's methods drastically reduced the price of a finished product (the private automobile), bringing it within the reach of less affluent customers. This success of the moving assembly line led to its popularity among practitioners in the manufacturing industry in the U.S.A. This forms a contribution to Lean development in

the use of standard inputs to create value in an operational process to satisfy customers (see Wild, 1989; 1998; Slack et al, 2007). Krajewski et al (2007) observe that the era of mass production was characterised by stability in the business environment, which permitted easy forecasting and execution of production schedules. While the mass production era had a big advantage in terms of low prices and simple products in high volumes during the era in which it was practiced, the 1960s marked the climax of this approach (Emiliani, 1998; Tan, 2001).

Womack et al (1990) highlight that, although the practitioners of mass production had the advantage of economies of scale, in that its approach permits bulk buying of input materials, leading to a low unit cost of production during this period, it was nevertheless characterised by problems of high volume of buffer input inventory, and there was a strong focus on standardised products. Buffer inventory is kept within the operational system of an organisation, meant to ensure that unexpected demands can be met with some degree of certainty. It is also known as safety stock (Wild, 1998). This became a problematic model as customers began to demand variety which the approach could not provide (Seddon 2003). It also had problems of extra workers on standby, and a lot of space needed to have an uninterrupted operational process. Seddon and Caulkin (2007) summarise this scenario noting that the advocates of mass production favoured the *economies of scale* over the "economies of flow" (p12), which Lean offers.

Moayed (2009) observes that mass production was characterised by large inventory leading to higher levels of holding costs for the practicing organisation. It was therefore viewed as a rigid means of operating, and was not actually cost effective for organisations because it did not permit divergent operations and its operational models could not avoid the associated costs of keeping massive inventory (Krajewski et al,

2007). Duguay et al (1997) reckon that the problem of excess production capacity associated with mass production aggravated a challenge of aligning operational process coordination with market requirements, especially in times of unstable market trends and customer behaviours.

Finally, as firms using mass production grew in size, they created a more complex situation to manage. As already discussed, such complexities resulted to factors such as increased productive capacities and speed of output, issues of unsold stock of products during periods of market depression, increased variety demanded by the customers (see, Dagauy, 1997).

These problems associated with mass production led to further search for improved operational ideas and approaches needed to solve emerging operational process challenges.

Frederic Taylor's scientific management also influenced practitioners in the manufacturing industry in the early 20th century (1911-20s) (see; Taylor, 1967). Emiliani (1998) narrates that the main idea of scientific management theory was to include the pursuit of operational process efficiency via enactment of a work environment culture to eliminate waste generated by workers in their daily activities through clear specification of job tasks, monitoring workers performance and administering due rewarding for performance. The scientific management was quite popular among organisations in the USA as at the time of its development, because it projected an operational efficiency in terms if increased work pace via scientific approach to harnessing employees' commitment to speedy task accomplishment. Taylor believed in an approach that trains, educates, and develops people to handle their

tasks efficiently and also believes that the organisational systems comes before the individual work (Thompson, 1915; Nelson, 1974).

Scientific Management was however criticised for reasons such as the stringent nature of Taylor's ideology, resulting to outright neglect to human relations among practicing organisations. Taylor's theory embraced shared responsibility, but excludes workers from the planning process, regardless of the sympathy he expressed for overworked (Velury, 2000). Similarly, Taylorism was based on few key motivational factors which included wage increment and a fair work environment for the workers to perform. Nevertheless, these became inadequate as the complexity in human resource practice increased, demand other factors that could recognise the context and the yearnings of workers per time and help organisations and the workers overcome the naïve views of human motivation or because it brought about a storm of labour opposition on (Littler, 1978) . These issues with the Scientific management led to sharp industrial reactions (e.g. prolonged strike action), leading to industrial crisis which truncated its popularity among American organisations (see, Aitken, 1960; Taylor, 1967; Gaither, 1992; Emiliani, 1998; Paez et al, 2004).

However, the theory of scientific management paved the way for the further development of operations management philosophy (Brown et al, 1988; Emiliani, 1998). The basic contribution to Lean development was that scientific management laid the ground work for standardisation of the work process, which later became a vital part of Lean practice (Water.1991; Emiliani, 1998).

2.4   The take-off of Lean

The weaknesses of the existing operations management models implemented before World War II continued to trigger the search for a better approach to solving operations management during the post war period. After the post-World War II period, Japanese manufacturers were faced with operational challenges ranging from vast shortages of materials and human resources through to limited ergonomic space for operation. This led to a further search for new and more suitable business philosophies that could cope with these challenges (Womack et al 1990; Abdulmalek and Rajgopal, 2007). Katayama and Bennet (1996) state that Lean started developing in Toyota in the 1950s, and was initially known as the 'Toyota Production System (TPS)'.

This shifted the attention of practitioners in the manufacturing industry from mere low cost of production to operational process waste elimination and the creation of better value that truly reflects the requirements of end customers (Rawabdeh, 2005). As a result of this, the development of the Toyota production system was advanced by Taichi Ohno in Japan. The Toyota production system focused on the reduction of non-value adding activities called waste, thereby reducing the time from customer order to the completion of transaction (see Ohno, 1978; 1988; Womack et al 1990). It was at the International Motor Vehicle Program established at Massachusetts Institute of Technology (IMVP), researcher John Krafcik originally coined the term "Lean production". The word "Lean" was suggested because it was viewed as the most suitable description for the Japanese operational systems (Womack et al., 1990, pg13; Dahlgaard and Dahlgaard-Park, 2006).

Cooney (2002) observes that Lean may not mean an absolute substitution for preceding models such as those of mass production, but it presents a new means of handling a production process on a platform of intensive attention to value creation for customers and the elimination of waste. Although preceding business operational philosophies used different models to pursue efficiency (e.g. economies of scale, close scientific monitoring of tasks), Lean tends to review the entire process for achieving efficiency via the implementation of various methods focused on identifying and elimination of waste (Melton, 2005). This observation agrees with the submission of Koh et al (2004) that Lean production brings together the advantages of craft production and mass production by avoiding the former's high cost and the latter's rigidity. This is based on the quest for effectiveness with which Lean is operated.

Supporting this idea, Taj and Morosan (2011) note that Lean production is a way of thinking that seeks to create a culture in which everyone in an organisation works to continuously improve. Similarly, Amoako-Gyampah and Boye (2001) and Chen and Meng (2010) suggest a continuous striving by managers to seek to implement Lean correctly based on the prevailing contexts that surround their operations (see, Scarborough and Terry, 1998). These writers suggest that a gradual adaptation to the base culture of Lean has a fundamental influence on its success, especially when it is new to the organisation's members. It would help organisations to show adequate respect and recognition for all stakeholders as well as prompt them to accept practices of efficiency and waste reduction. Mention of stakeholders shows a recognition, not so apparent in earlier writings, that the environment of the organization beyond just customers could be important. Lewis (2000) takes this argument further, pointing out that the success of Lean application largely depends on prevailing contextual factors

such as the type of market, available resources, the enabling operational structure, and other environmental factors that are connected to the organisation's operational process.

Yusuf and Adeleye (2002) say that organisations tend to take to the practice of Lean with the intention of achieving long term survival via operational process flexibilities, with a focus on the reliability of adopted Lean approach. Hallgren and Olhager (2009) note that this can create an enabling environment for the firm to reach its target market with reduced-price products, without compromising customers' satisfaction. However, Sawhney et al (2010) observe that the cost reduction advantage of Lean practice can sometimes only be sustained in the short run due to factors like fragility of the business, changes in expectation/s of the stakeholders, and other internal factors such as poor operational process scheduling. This is because the approaches to Lean practice by many organisations are simply unplanned instead of being system-wide, leading to low productivity and inefficiency in the longer run (see Berry and Hill, 1992; Soman et al, 2004; and Paez et al, 2004 for further discussions of the pros and cons of cost reduction).

Radnor et al (2012) argue this differently, saying that an effective focus on value creation in a firm's operational process is what can naturally lead to efficiency, in terms of cost reduction, via the practice of waste elimination. They say this can support the ultimate aim of producing quality products that meet market requirements and sustainability. This submission tends to suggest that the notion of effectiveness in an operational process is not complete unless it is orientated, at least in part, to efficiency. Hines et al (2004), while acknowledging the importance of a focus on waste, nevertheless argue that the development of Lean practice has gone beyond mere shop-floor waste elimination and avoidance of unnecessary costs. They advise organisations

to put meeting customers' requirements as a first priority, adding that this is actually more important than avoiding waste in shop-floor operations processes. Indeed, they note that customers are vital to the business operation and, as such, are also in a position to decide what ultimately constitutes operational waste.

This argument is synonymous with the submission of Byrne (2013) that the quest for Lean organisations to act in developing and effecting value additions for the customers, who are among the stakeholders recognised in Lean practice, distinguishes them from competitors and positions them for both operational effectiveness and efficiency.

Kabst et al (1996) talk about forces such as intense competition in both international and local markets, the dynamic nature of technological development and pressure for cost effective operations. They say these were largely responsible for the wide spread adoption of Lean philosophy by organisations in different sectors. Lean commentators therefore emphasise productivity in operational systems. Gaither (1992) views productivity as the amount of products or services produced from an operational system with a given level of available resources. Kabst et al (1996) view Lean as a concerted effort by an organisation to make constant improvement in the details of their operational process to address environmental challenges (Adler and Cole, 1993; Sohal and Egglestone, 1994). "...Companies succeed because they adopt relevant practices in each of their businesses and implement them to ensure that performance and productivity improve" Sohal and Egglestone (1994; pg37). Operational process productivity is influenced by several factors, such as interaction with workers and effective control measures over material resources, in the direction of the set operational process scheduled to meet customers' requirements (Spithoven, 2001).

Similarly, Hicks (2007) reckons that, apart from material input and human capital, what makes an organisation's systems function is the quality of information circulated through its subsystems, which informs their interactions with the environment to produce an effective operational system that is based on current details of customers' requirements. This is due to the fact that vital operational decisions are dependent on the availability of the right pieces of information which can help Lean operation managers avoid errors that can lead to waste. Smith (2011) adds that it is only through the sincere sharing of such information that members of organisations can develop their operational processes most effectively. Tseng (2010) observes that maintaining a culture of timely distribution of the right information across levels of an organisation can promote creativity and adaptability among its employees and leaders, and the achievement of a sustainable competitive advantage through productive interactions with the organisation's environment. A reasonable level of predictive forecasting of the environment is required to make Lean work successfully for an organisation (Yusuf and Adeleye, 2002). This would ensure a Lean operational process that focuses on adding value through the use of the right information, on a platform of good organisation, visualisation and representation of the right information, which could enable productive understanding and exchange of the right operational information across the operational cadres, in collaboration with the set Lean objectives to satisfy stakeholders. Distorted information about customer demand, for example, can lead to tremendous inefficiencies, and ultimately resulting to non-value adding activities within the operational process and the creation of waste which Lean does not accept (Lee et al, 1997; Boyle et al, 2011).

However, Hicks (2007) warns Lean managers that there is need to avoid the issue of circulating excessive information that can lead to confusion in an operational system. S/he advises managers to use their positions and experiences to sieve information to ensure only useful instances are circulated for actions. Such practice would facilitate the value creation objective pursued in Lean practice.

The above description of Lean practice can best be related to the production and manufacturing industry where the development of Japanese Lean practice began. Lean authors generally agree that operations management activities in these sectors are based on empirical evidence in their quest to achieve productivity (Lowe and Oliver, 1997). Today, many organisations outside Japan have adopted the practice of Lean successfully in their operational processes in order to achieve productivity needed for survival. Such organisations have advanced different models to Lean practice meant to satisfy their customers on a platform of efficiency (Sanchez and Perez, 2001). The movement of Lean from Japan to the wider world led to the idea that it is not merely a practice or a set of methods, but a complete philosophy for improvement of the operational process of an organisation, facilitating the skilful manipulation of business environments (Bhasin and Burcher, 2006; Arlbjorn et al 2011). The next section discusses the practice of Lean philosophies.

2.5   Lean viewed as a philosophy/culture

Lean has been viewed as a philosophy in operations management, in that its implementation informs the operational process of the entire system of a Lean practicing organisation (Elliot, 2001). Lean philosophy is an organisation-wide practice that requires the continuous involvement of participants at all levels, across the entire

organisation, in various actions to achieve value and promote efficiency and productivity in the system. It applies a stream of strategies and tools in the implementation of Lean philosophical objectives in the operational processes of an organisation (Bhasin and Burcher, 2006).

Lean has also been described as 'cultural'. The term 'organisational culture' directs attention to taken-for-granted norms about how work and interactions are carried out to achieve set objectives (Akpotor et al, 1999). Lean is said to be concerned with culture in the sense that all organizational participants should not take it for granted that they need to be focused on the set objectives of efficiency and waste minimisation. This would enhance an operational process premised on effective understanding among the organisational members on the expectations of the stakeholders and prompt them to act collaboratively to satisfy these stakeholders (Angelis et al, 2011; Mann, 2005; Wee and Wu, 2009).

Viewing Lean form a philosophical/cultural perspective makes it a stream of organisational practice that goes beyond the boundaries of an organisation's operational process to integrate actions in sourcing and using required resources (in the case of Lean manufacture) to co-create further value to satisfy targeted customers, while working to eliminate non value adding activities that may be involved in the entire operational process (Storbacka et al, 2012).

It therefore follows that Lean philosophy/culture could take on an approach to operational process with the basic aim of *creating value*. These include emphasizing total system efficiency, continual improvement, value-added activity, and respect for people. Among the targets of Lean principles is the focus on streamlining the flow of

production material throughout the entire enterprise. Lean supports this by reducing production variability (Bhasin and Burcher, 2006; Álvarez et al, 2009).

However, rather than imposing operational activities on the end customers, the practice of Lean philosophy/culture has its focus on understanding customer demands and requirements, which informs the entire design of activities with the operational flow process and makes the task of recognising and eliminating waste easier (Sahoo et al, 2008).

Dibia et al (2011) re-examine Lean in the Japanese context (where the practice of Lean was popularised), comparing this with other parts of the world. They observe that the human side is ultimately important for the implementation of Lean to ensure customer satisfaction, profitability for shareholders and the sustenance of Lean philosophy which, they say, was part of the major focus at the early stage of Lean development in Japan. They acknowledge human capital as a major asset to achieving the objective of value development and waste elimination, which Lean philosophy stands for. Ryder (2011) supports effective human resource development alongside Lean practice, noting that the Japanese practice of Lean was developed with a keen intention to maximise all-round satisfaction for all stakeholders. However, the term 'all stakeholders' appears to be limited to end customers- who patronise their products in the market, and internal organisation members - who are directly involved in the operational process, in his/her analysis. S/he points to a limitation on their approach to Lean practice, as current organisational practice tends to face more stakeholders other than these). S/he note further that Lean in this Japanese culture was founded on the platform of effective recognition of the these stakeholders needs to participate in the Lean operational process, such as effective rewards and motivation for Lean organisational members and

other Lean customer loyalty practices (see, Womack et al, 1990). Ryder claims that this focus on stakeholder satisfaction gives rise to an operational system that recognises all concerned interests as one 'family'. This affirms the importance of human capital development, which was associated with the wide spread success of Lean in management history.

2.6   Lean Tools

The implementation of Lean as a philosophy/culture in an organisation could lead to the use of different tools to actualise its value creation objective in an operational process. Some of these vital tools applied under Lean are discussed below.

2.6.1   Just- In -Time practice in relation to Lean

Just-in-time (JIT) production is a method whereby the production lead-time is greatly shortened by maintaining on hand only the minimum stock necessary to hold the processes together. JIT involves checking the degree of inventory quantity, disclosing the existence of surplus input equipment and workers, and helping to eliminate such surpluses that are not immediately needed in the production process (Sugimori et al, 1977). JIT simply means the supply of what is needed, when it is needed and in the exact quantity (Ohno, 1978). Bruce et al (2004) note that Lean practice requires the prompt replenishment of material inputs and timely deliveries, to enable the firm to meet its customers' schedules. These authors say that JIT is an umbrella term for different techniques with the purpose to improve product quality as well as reduce waste in the operational process (Miltenburg, 2001). "Elimination of waste is the cornerstone of JIT" (Rawabdeh, 2005; pg802).

Petersen (2002), whilst acknowledging the popularity of JIT practice in the Japanese auto industry, recounts that it actually originated in the USA, started by E. Kanzlar at the Fordson Tractor Plant in the early 20th century. JIT has proven to aid the synchronic operational system adopted by Lean practitioners, helping them to achieve a free flow operation while minimising inventory holding cost (Rawabdeh, 2005). "A fairly immediate benefit of JIT is inventory reduction..." (Sohal et al 1993; pg22). Papadopoulou and Ozbayrak (2005) support this idea, noting that organisations often adopt JIT practice along with Lean operations to yield an increased efficiency and productivity throughout the organisation system. While Majima (1992) notes that JIT practice puts the people first in its implementation, Taylor (1997), based on observations at Toyota, notes that JIT practice has a profound way of prompting workers and suppliers to work under pressure to meet schedules, since its practice does not encourage stockpiling of inventory. However, Majima (1992) cautions Lean organisations to seek to protect workers in the organisation as they implement Lean practices such as JIT, noting that the operational process requires the skills of the human resource to function, so over-pressurising workers is counter-productive. This, s/he notes is relevant to effective Lean practice (see, Hicks, 2007; Papadopoulos et al, 2011).

Lean authors tend to emphasise the utility of records of internal operational processes for effective JIT practice. For instance, Monden (1998) concurs that this provides an effective means for managing JIT. It gives management easy access to relevant operational process details needed to support the practice of JIT more effectively, recognising potential market demands and directing the operational system to meeting them (see, Onho, 1988). Papadopoulou and Ozbayrak (2005) also realise that, in some cases, the practice of absolute JIT can be made impossible due to uncontrollable

environmental variables, such as logistical defects, unexpected scarcity of input supply and other challenges or uncertainties that may affect operations. As a result of this, Sawhney et al (2010) highlight the need for Lean organisations to structure their operational processes to suit their actual business environments instead of making idealistic assumptions about what can be achieved. Petersen (2002) supports this idea, noting that effective JIT practice requires that material inputs are of required quality standards that can address identified customers' requirements.

Due to inherent risks that challenge JIT practice, writers have suggest the need for effective risk assessment which could help organisations address the possibility of breaches due to business environment that can influence their operational process, as they seek to meet stakeholders expectations (see, Trkman and McCormack,2009; Yang et al, 2011).

Furthermore, Levey (1997) notes that constraining factors, such as distance and consistent delays, could make organisations resolve to keep inventory in their operations, regardless of their desire to focus on Lean and JIT. Christopher and Ryals (1999) note further that the effects of shortage of stock can be devastating, and can lead to breaches of contractual agreement with customers/clients and pose the risk of volatility of returns on invested resources. Similarly, DeBord (2011) points out that JIT is vulnerable to catastrophic events such as natural disasters, which can lead to sharp disruptions to the flow of material inputs; noting that hedging such risks in order to enhance continuous JIT practice is difficult, especially in a situation where the suppliers of these materials are located within the same local environment.

Schultz et al (1999) advise organisations in such risky situations to adopt the principle of small safety stock holding, to at least secure unhindered operations and be able to absorb environmental uncertainties when they occur. This is arguably a compromise position, balancing the desire for Lean and JIT with the practicalities of managing in a sometimes unpredictable business environment. Taylor (1997) has a practical example of this at Toyota where he observes that at some time in the 1990s, due to shortages of suppliers, some input materials were kept in the system as buffer inventory to hedge against interruption in the operational system and adapt to the situation. This tends to suggest that Lean practice may not mean absolute avoidance of inventory holding in an organisation's practice after all: it comes with the aim of merely reducing *unnecessary* inventory.

According to Slack et al (2007), the redirection of inventory being made possible through the practice of Lean could, among other benefits, help the organisation to achieve a more effective use of its working capital resources to the advantage of the organisation. Christopher and Ryals (1999) share this understanding, noting further that prudence in the redirection of working capital and other resources can engender sustained value for shareholders at the end of each business period, which can boost their long term confidence in the operations of the organisation. They assert further that the organisation's managers would need to recognise and shoulder the responsibilities of grasping and monitoring efficient and profitable business opportunities via the application of the most suitable strategies in their operational process, leading to long term value creation for shareholders. Christopher and Ryals (1999) advise organisations to seek to address the goal of value creation in terms of manipulation of the operational process to yield returns on invested funds instead of just producing "paper profits"

(pg1). Perttersen (2009) says this is achievable via a continuous act by the Lean managers to work towards failure prevention in the flow of materials into the organisation and monitoring of operational systems to avert possible breaches that can affect the JIT objectives of the organisation. Commentators therefore point out that JIT Managers would require that an organisation should have reliable partners (e.g. upstream suppliers) to make the idea successful, with the intention to build a reliable operational process, with effective flow of materials input (Kros et al, 2006).

However, Pettersen (2009) notes that this is possible in the short run, but care must be taken by the organisation in the long run to ensure such benefit does not result in managers taking their eye off the ball of meeting customers' requirements: "... an internally focused cost reduction initiative can differ substantially from externally focused initiative to improve customers' satisfaction" (pg133). Yu-Lee (2011), explaining this further, notes that in some cases, the elimination of waste may not automatically translate into reduction in cost, but such effort presents the opportunity to achieve output capacity via a more efficient use of resources focused on customer needs. Cooney (2002) raises concern that the realities of JIT, in terms of value adding to the operational process of a Lean organisation, may not translate to market place profitability due to unpredictable challenges associated with JIT practice.

Spithoven (2001) criticises absolute JIT operational practice on the grounds that, in some cases, it defeats the benefit of bulk buying (economies of scale), which is practicable in other operational models such as mass production. This is because JIT practice does not encourage bulk buying of input that would lead to mass storage of inventory. Moreover, Kollberg et al (2007) draw the attention of Lean practitioners to the fact that absolute JIT practice requires relative predictability of demand, which they

note may not be possible in certain situations. They cite an example of a Lean health care system where the flow-through of different categories of patients may not be predictable at all times.

In a related finding, Sohal et al (1993) emphasise the need to address issues relating to human resources commitment in the practice of JIT to promote corporate organisational values in line with the objective of waste elimination. They advise that Lean organisations may sometimes need to modify their operational styles to create a new workplace culture that promotes JIT. They however caution Lean managers that the alteration of culture requires a long-term process, needing the patience and understanding of the organisation's members to take full effect.

Liker, in an interview with Metcalfe (2011), speaks about the Toyota operational process. He defines culture as shared beliefs, values and behaviours relating to how business is conducted. He claims that, without a well-defined and nurtured cultural practice, the Toyota philosophy of Lean would not have achieved its success, especially during periods of economic recession.

From the above-referenced writings on JIT practice, it seems clear that absolute JIT encourages localisation of supply connections, needed for the effective inflow of input materials. However reports have it that, despite the advantages of this in terms of cost and time, supply can become fragile and problematic, especially during crises periods. For example, Powell (2011) recounting an observation of how a Tsunami disrupted supply chains in Japan, notes that, due to the proximity of suppliers, many organisations and their partners could not resume their supply chain relationships as everyone was equally affected by the natural disaster, leading to further losses of revenue, and losses

of local and international market share, in addition to what they suffered directly from the Tsunami disaster. This experience raises the question of whether, in some circumstances, it is better to have distanced supply partners rather than the current local suppliers' base encouraged by many writers on Lean. Or can we have a supplier base at a distance as a back up to cover unexpected breaches in this regard? It should also be noted that this point is not only relevant in the case of natural disasters; criminality and civil unrest can both halt operational processes too (see, Gulyani, 2001; Eti et al, 2006; Olufemi and Oluseyi, 2007; Ubogu et al, 2011), and this is very pertinent to the Nigerian context.

Furthermore, while it is widely claimed by authors and practitioners that JIT can support efficiency of an organisations operations, it seems that the effect of JIT practice can be problematic to suppliers who are faced with the pressure of meeting short term supply schedules. As a result of supplier failures, a purchasing organisation may have to sacrifice the possibility of economies of scale (the benefit of buying in bulk), and order from multiple suppliers (Kros et al, 2006; Sloman, 2008). Due to this challenge, a JIT practicing organisation may face the reality of not being able to source required materials if there is no effective collaborative link with the suppliers. This can also happen if the supply chain partners have no assurance of being able to turn over their stock, if they are no longer needed by the partnering organisation, which could also lead to unsold inventory (Belk, 2014; Shabtay et al, 2014).

2.6.2 Continuous improvement (Kaizen)

Kaizen means continuous improvement in the process of Lean implementation, seeking modification via learning and skills development to make the operational process more

efficient and productive in meeting customers' requirement (Schuring, 1996). The emphasis on skills development makes this similar to the idea of organisational learning.

Senge (2006) defines a learning organisation as one that encourages its members to show concerted commitment to learning in all parts of its operational system, making sure that employees' efforts complement each other. Organisational learning is supposed to be implemented in a collaborative operational framework, meant to achieve survival of the organisational system. Senge argues further that effective learning enhances operational proficiency in the entire system of an organisation. Although the concept of a learning organisation tends to be wider in scope than Lean, because it covers areas other than operational process (e.g., high-level strategy), adopting a culture of continuous learning can influence the achievement of kaizen goals in an organisation: "...kaizen says to find what you could have done better" (Metcalfe, 2011; pg3). Suraj and Bontis (2012) say that this is the best means to generate increased value to satisfy customers. This assertion tallies with the remark of Bahra (2001), that the best competitive advantage a firm can have is to learn faster than its competitors.

Balle and Reginier (2007) advise Lean managers to consider the systemic effects of their operational process improvement approaches (i.e. Kaizen practices) noting that an activity designed paradigm to solve a problem at one end of the system can create new problems elsewhere, cancelling the original positive results. This is because Lean thinking can have effects in all parts of an organisation, not just the operational function, even though the intervention may initially be in the operational process (Hicks, 2007). Thus, the Lean manager needs to consider the potential impacts of a change both on the current operational system and more widely. Importantly,

"...successful Lean implementation ... is essentially about reducing ambiguities...." (Hicks, 2007, pg35). A focused, enterprise-wide approach to continuous improvement is needed, based on efficiency, productivity and improved quality across the entire organisation (Hicks, 2007). Here the recognition of the value of Systems Thinking in connection with kaizen is brought to bear, and it intended later in the thesis, to extend application of the theory and practice of Systems Thinking in the context of Lean.

Smeds (1994) recognises that kaizen has prime value as an *innovative* management approach, which can lead to the improvement of previous practices of Lean in an organisation. According to Smeds (1994), innovation is defined as an invention, idea or original approach implemented with the intention to create wealth. Smeds classifies innovation into two kinds: incremental innovation, which is implemented to improve on current practice; and radical innovation, which is the development of brand new ideas meant to create and explore new business opportunities through the practice of Lean. He argues that both of these models of innovation are needed for a successful organisational practice. Kondo, in an interview with Powell (2000), points out that no matter how sophisticated a radical idea may seem, it requires a continuous build up via an incremental input to ensure its sustenance for the long term, which suggests that the two types of innovation have to be tightly interwoven. Smeds (1994) believes that continuous improvement demands an internal organisational culture and guidelines for continuous thinking, creating new visions and strategies with a value-laden purpose. He notes that this is achievable by combining individual contributions into a holistic organisational practice, which can enhance all-round creativity within Kaizen.

Furthermore, Liker (cited in Metcalfe, 2011) observes that Lean cultural practices, such as Kaizen, have a significant positive influence on how problems are assessed and

solved in organisations. It requires an approach to encouraging employees that promotes their interaction and knowledge-sharing (Van De Ven, 1986). The achievement of an improved operational process layout, removal of unnecessary bottlenecks, lead time compression, free flow of valuable information, and operational process flexibilities meant to eliminate system congestion and delays are some of the immediate benefits of innovation associated with Kaizen (Smeds, 1994).

Comm and Mathaisel (2005) recognise that continuous improvement, the main idea behind Kaizen, is a relevant practice in Lean operations, which encourages the optimal use of staff skills by the method of integration of direct and indirect tasks (i.e., those that are integral to the production process and those that are necessary in support) that can help in the further development of the overall operational process of an organisation. Similarly, they suggest that Lean managers should explore the advantages of benchmarking with contemporary organisations in their industry to facilitate further learning. They express the confidence that this practice can enhance better understanding of customers' needs and facilitate sustainable operational process effectiveness. Comm and Mathaisel (2005) define benchmarking as a deliberate act to compare the operational process of an organisation with those of others. They believe that effective benchmarking practice can facilitate competitiveness across the entire organisation. However, I would suggest that this is only useful when the operations and context of the comparator organisation are sufficiently similar to make the comparison meaningful: comparisons that disregard critical differences and contextual issues may be problematic. This is a crucial lesson from complexity theory (e.g., Cilliers, 1998; Stacey et al, 2000).

In line with the above argument for innovation in Kaizen practice, Metcalfe (2011), in an interview with Liker, talks about new versions of kaizen in Toyota. He points to the practice of 'hansei' (deep reflection on current happenings), a new model of improvement practice. It emphasises self-criticism and the development of better plans for the future. It implements a subjective reflection method among the organisation's members, leading to productive brainstorming on current issues and seeks to map out working strategies for improvement.

Byrne (2013) describes Lean kaizen noting that, when kaizen is added to Lean, organisations act in different ways than usual, such as the use of kaizen to either enhance existing values or develop more effective ones geared to their customers' needs. This points to the fact that Kaizen is not actually Lean itself, but a *means* to achieve Lean objectives in an operational system, which the leaders can explore with the collaboration of other organisational members, in their quest to meet stakeholders' expectations. It seems that effective Kaizen practice reminds practitioners of Lean of the need to appreciate and preserve the core values of an operational system which relate to customers' requirements.

Similarly, Liker, in an interview session, identifies 'genchi genbutsu' (view the actual situation to deeply understand what it is), as a related practice of Lean kaizen (Metcalfe, 2011). The idea is that effective kaizen practice involves giving priority to *investigations* in a threatening situation. Liker explains this further, noting that the extent to which a problem is understood influences the kind of solution selected to solve it. These assertions tend to suggest that Lean practices, especially kaizen, represent an ongoing learning process in an organisational system that seeks to renew and improve on the current pursuit of set objectives, and positions the organisation on a platform of

resilience to crisis situations. Liker goes so far as to say that an effective practice of kaizen can allow a Lean organisation to turn a crisis situation into an opportunity. This requires a refusal to apportion blame for problems and the seeking of collaboration between organisational members to proactively respond to a crisis: "Lean production systems attempt to design an environment where workers perform challenging jobs collaboratively" (Lee and Pecci, 2008, pg9).

2.6.3   Rapid Improvement Event

According to Laraia et al (1999), a Rapid Improvement Event (RIE) is a Lean tool used to create small and quick changes, in three phases. It begins with a preparation period, followed by a five-day event to identify changes and a three to four week follow-up period when changes are implemented. Workshops are used, which emphasise teamwork and interaction with the aim of encouraging an ownership mentality and high productivity among organisational members (Laraia et al, 1999; McNichols et al, 1999; Radnor and Walley, 2008; Papadopoulos, 2009; Ufua et al, 2014).

The use of RIE is usually cross functional, involving different stakeholders (e.g. suppliers, customers and internal organisational members) (Robinson and Schroeder, 2009). All participants are notified in advance about the workshop and the proposed topic to be discussed. Participants are allowed the freedom to express their opinions during discussion. The aim is to engage these participants in the improvement process to achieve rapid results which could underpin operational process decisions and actions aimed at achieving their set objectives (Fine et al, 2009; Simon et al, 2012). However, a quick adoption of suggestions from a rapid improvement event can face challenges if the approval for implementation is to be granted by a different group, such as managers

outside the room. Managers usually want to reserve the final decisions for themselves because they may have differences in worldview from the participants, there may be resource availability issues, timing issues, etc. (Checkland and Scholes, 1990; Laraia et al, 1999; Papadopoulos, 2009).

2.6.4   Value stream mapping

Value stream mapping is a tool within Lean philosophy which comprises the review of all actions, both value adding and non-value adding, that are performed in the process of production and deliveries of products or services to satisfy customers (Rother and Shook, 1999; Poppendieck, 2002). It is an approach to understand the flow of materials and information through the operational process, focusing on the development and sustenance of value-adding activities that meet set operational objectives. It is seen as the starting point for identifying the root causes of waste in an operational system (Abdulmalek and Rajgopal, 2007; Lasa et al, 2008). It was developed in the 1990s to help Lean practitioners to identify non value activities in an operational system and trigger a move to eliminate them via the most suitable approach (Singh and Sharma, 2009). The practice of value stream mapping involves the use of valuable data on operational process activities, such as work-in- progress, cycle times, quality, equipment function and other variables to effectively aid manager's decisions for improvement of the operational process (as well as support the smooth flow of orders and work) by eliminating all causes of demand distortion.

Jones et al (1997) observe that effective value stream mapping has the potential to ensure a suitable organisation of work flows with no interruptions, shortening set-up or response times to make or deliver products or services every day/week.   Through

preventive maintenance, it also helps to ensure that no prolonged breakdowns occur. Jones et al (1997) note further that value stream mapping can define appropriate operational checks to enhance standardised work performance in line with customers' demands. This, they say, has the advantage of facilitating the discovery of root causes of waste in the operational system and enables their elimination. Once root causes have been discovered, this knowledge can be used proactively to prevent recurrences of problems.

Research by Gurumurthy and Kodali (2011); and Damelio (2011) suggest that the practice of effective value stream mapping makes the operational system become more transparent, making the improvement process easier. Key to success is the critical assessment of all processes, from raw material input through to human resource deployment and production methods, to get a clear understanding of the current state of operations and establish necessary measures for improvement to yield the elimination of waste (Abdulamalek and Rajgopal, 2007).

Seddon and O'Donovan (2009) argue that a key issue in Lean waste elimination is to develop a comprehensive understanding of the system and the wider, systemic causes of waste in the operational process. This tends to suggest that Lean philosophy in general, although often viewed as a relatively easy practice, could be more challenging to the organisation and concerned stakeholders than it first appears; especially when it comes to defining the origins of waste and identifying and defining values that are held by customers and other relevant stakeholders (Melton, 2005). We can call this the 'systemic challenge' of implementing Lean effectively, and this has led to difficulties in some organisations, especially outside of the manufacturing sector (Abdulamalek and Rajgopal, 2007). The systemic challenge is of central concern in this thesis.

2.6.5 Team work

Lean organisations view team work as a fundamental component of their operational process, and it has been claimed that team work is essential to successful implementation and the achievement of higher productivity (Forza, 1996). Womack et al (1990) argue that the practice of good (internal and external) stakeholder relationships management among work teams was at the root of the success of Lean in its early stages of development in Japan. Sugimori et al (1977), in their observations of the internal stakeholder management model in the Toyota production system, identify the importance of team attributes such as consciousness of the need to work together as a group in the pursuit of equality amongst employees. They observe that these factors were responsible for the diligence and devotion to work displayed by shop floor workers in the organisation. They found that Toyota was able to establish an excellent labour force by showing respect for workers and concern for safety in the work place, while still putting emphasis on their operational aim of waste elimination.

Team work is said to be foundational for a multi-skilled workforce, as it allows individuals to develop multiple, complementary specialisations at the same time as collaborating with others. Teams should ideally be self-directed, with workers achieving goals, meeting targets and continuously improving the process, constantly striving for perfection (Dibia et al, 2011).

However, the idea of multi-skilled teams has not been accepted uncritically. It has been pointed out that multi-skilling the workforce requires a substantial training investment by the Lean organisation, and other approaches (such as ensuring an effective maintenance culture) are necessary too (Sánchez, and Pérez, 2001). Arnheiter and

Maleyeff (2005) recommend the *skilful interpretation* of Lean concepts by managers, without taking it for granted that every prescription should be followed slavishly, to help realign the work tasks of employees for optimum performance, giving them the necessary assurance that their contributions are of value to the success of the organisation.

Klefsjo et al (2008), recognising the importance of coherence in production processes, stress the integration of the entire set of operational subsystems in the quest for efficiency in quality management. This, they say, mandates teamwork, as this is the only effective means by which common objectives of Lean practice in an organisation can be formulated, communicated and enacted.

However, Dibia et al (2011) caution that the adoption of team work can come with the challenge of resistance from the employees. They ask Lean managers to consider what they call a "critical" approach to the development of criteria for setting up work teams, looking at human resource planning as an aspect of Lean philosophy. Similarly, Schuring (1996) points out that, in some cases, team conflict can arise in the process of implementing Lean, and this suggests the need for a clever structuring of teams so that responsibilities and operational boundaries are clear, enabling the teams to handle diversities and complexities as well as complement other teams within the operational system.

Furthermore, Comm and Mathaisel (2005) suggest the continuous updating of workers' skills via training to help them cope with changes in the environment, as the implementation of Lean proceeds. Dotchin and Oakland (1992) reckon that human resource development empowers an organisation's members to act in the right way to

sustain quality deliveries to the stakeholders. Spithoven (2001) identifies the need for the rationalisation and decentralisation of operational process control to teams, which is a fundamental practice in Lean philosophy that can continue to enhance all-round flexibility in operational processes, making the task of modification of output qualities easier. However, s/he cautions managers to balance such a decentralised approach with due accountability that is able to check excesses that can lead to breaches.

Karlsson and Ahlstrom (1995) look at the effects that organisational remuneration systems have on the implementation of Lean. They remark that team work requiring flexible task performance from members should be backed up with fair remuneration that is consistent with the required flexibility. They further stress the importance of exploring how remuneration structures can facilitate employees' cooperation with the implementation of Lean team work. Similarly, Lee and Pecci (2008) say that commitment to a fair and appropriate remuneration structure can motivate staff willingness to support and enact Lean practices.

2.6.6   Waste Elimination

Waste elimination is a goal of Lean, as discussed earlier, but is also viewed by many practitioners as a tool, in the sense that it is a key lever to achieving efficiency. Waste elimination is arguably at the base of every Lean practice, as it seeks to achieve more value with the use of fewer resources (Jorgensen and Emmitt, 2008).

Narasimhan et al (2006) recognise different types of waste that could be eliminated, including excessive set up times, large amounts of buffer stock, variability in material flow, over production of finished goods, transportation waste, defects waste and motion waste (see, Hines and Rich 1998). These authors also hold the same view as other Lean

writers that waste is anything above the minimum amount of resources that is essential to add value to the operational process. Samaddar and Heiko (1993) note that excessive inventory storage times can lead to obsolescence and sometimes increased storage costs. "Overproduction is considered the worst form of waste" (Taylor 1997; pg1).

Furthermore, Samaddar and Heiko (1993) suggest that managers need to ensure that an operational process is scheduled in line with customers' requirements. They also recognise the possibility of waste in the services sector, in the forms of duplication of information leading to slow deliveries, and sometimes forwarding valuable information to the wrong users. They emphasise the importance of understanding what constitutes waste in an operational system and suggest the integration of efforts to eliminate it. While this may be similar to the idea of waste identified in manufacturing literature (Sanchez and Perez, 2001; Pederson and Huniche 2011), the difference in the service sector is the intangible form that waste usually takes (e.g. delays), and the contexts in which it is identified.

Although the fight to achieve waste elimination has continued among Lean practitioners, the possibility of keeping an absolute waste free operational process tends to be a challenging task for Lean managers. This is because 'waste' might be kept within the operational system to secure un-hindered flow, sometimes due to contextual environmental forces (see Gulyani, 2001; Arnheiter and Maleyeff, 2005). This kind of waste is referred to as *type 1*: those activities in the operating system that are pragmatically required, but would not make a contribution to value in an ideal system. This suggests that the type 1 waste should not actually be termed 'waste,' at least up to a level of acceptance within an operational process, because it is necessary for the survival of the operational system or an attempt to eliminate waste may affect other

value activities (Womack and Jones, 2003). Type 2 waste is classified as waste that is not required in the system at all and should be eliminated (Womack and Jones 2003).While type 2 waste are not tolerated at any levels, Emiliani (2001) notes that large amounts of type 2 waste can lead to poor competitiveness in an operational process.

Rawabdeh (2005) also talks about operational process waste in the form of necessary but non value adding waste (NVA). Rawabdeh explains this to mean waste that *appears* to be avoidable in the operational system, but which may still have relevance, and this needs to be considered so negative side-effects of cuts can be avoided. Rawabdeh (2005) further notes that the task of searching for waste in an operational system can be a challenging one due to the fact that all 'wastes' were originally introduced for some purpose, so removing them can be destructive to other parts of the functioning system. This argument tends to suggest that there can be an inbuilt 'waste' that the organisation needs to keep in its operational process and cannot do without, so actually it is *indirectly* value-adding.

These arguments about waste elimination tend to raise concerns about the meaning of waste. It is arguably right to acknowledge the difficulty involved in defining waste, and it should also be pointed out that it can be difficult to achieve a sustained understanding of waste over a significant period of time. A recognised waste in an operational system today can become an asset of value in the future, due to changes in environmental priorities, such as customer and other stakeholder requirements, and the emergence of new business opportunities (see the section on Zero Waste, later in this chapter, for a practice that turns 'waste' into useful inputs to new manufacturing processes). This

dilemma requires the Lean manager to exercise critical thinking in the process of defining waste to be removed and 'waste' to be transformed into a new raw material.

It can also be difficult to reach an agreement with organisational members on what should be considered waste since "no one may want to accept that his functioning in the operational system is a waste" (Poppendieck, 2002; pg3). Achieving a critical definition of waste therefore requires the manager and those affected by his or her decision making to view it from different perspectives and using different frames. This can enhance his or her overall understanding and inform decision making on whether to declare an item in the operational system a waste or an item of value.

Having discussed waste elimination and value stream mapping as vital tools in Lean philosophy, it has become clear that the success of Lean depends on the manager's approach to implementation. This leaves the Lean manager with the task of alignment of these practices with the set objectives of the practicing organisation. This is because the elements which are considered to be most appropriate for Lean implementation will vary with the structure and other key environmental variables surrounding the organisation (Sohal et al, 1993). The selected tools may also require the support of the affected stakeholders of the system operated by the Lean organisation (Angelis et al, 2011). As a result, those immersed in doing the job of the Lean manager are best qualified to recognise problems and suggest pathways to improvement that are relevant to the context (Angelis et al, 2011). Mention of stakeholders in this paragraph leads into looking at stakeholder management in more detail below.

2.7   Stakeholder Management in relation to Lean

Jones and Wick (1999) define stakeholder theory as research effort meant to explore the stakeholder concept as it relates to an organisation's management. The term has been described in other forms such as, 'stakeholder theory; 'stakeholders' management' and 'stakeholder model' by different authors (see, Donaldson and Preston, 1995). Garrido and Pasquire (2011) note that experienced Lean practitioners tend to devote much of their effort to satisfying end customers, using their internal resources to identify and address their expressed requirements. Despite a strong promotional effort by authors of Lean (see later in this section), there is nevertheless still a significant gap in its application as managers who are less well versed in practicing other associate models alongside Lean could 'hold back' from considering external stakeholder perspectives, who are affected but neglected. The narrow stakeholder view, restricted to internal stakeholders only (and sometimes to customers, but rarely beyond) constitutes a significant gap in Lean practice that will be addressed in this research (see, Womack et al 1990; Yang et al, 2011; Bryne, 2013).

There are a wide number of ways that managers can explore Lean further, especially in terms of how it can address the areas of interest of stakeholders. Gibson (2000) defines 'interest', in the stakeholder management context, as the needs and wants of stakeholders which may be satisfied by the other party. Lean managers' awareness of the potential influences of these stakeholders on the operational process seems to be considerably lacking (Boyle et al, 2011; Yang et al, 2011). This is an obvious fact, in the sense that every business organisation interacts with its environment, including different stakeholders, regardless of its chosen operational philosophy. However, organisations tend to create a separation between governance, where stakeholders sit on

boards; strategy, where they may be consulted; marketing where detailed feedback on ideas for products and services is sought from potential customers; and operations, which are often viewed as primarily internal to the organisation, even though Lean philosophy asks us to ensure that production processes are geared to fulfilling customer requirements. Closeness to stakeholders serves as means of exploring the business environment as well as sustaining the organisation's adaptability to environmental demands, resulting in a more relevant and stable operational process (Emery and Trist, 1965).

There is an argument in the literature about how to define stakeholders. It is unlikely that this will be resolved any time soon, as different definitions may arise due to differences in operational contexts. Management scientists talk about various different types of theory of stakeholder management.

First, *normative stakeholder theory*; this is used to help organisations identify who should count as a stakeholder. It says that stakeholders are those parties that an organisation has a moral obligation to address or unanimously considers as stakeholders to their operational process (Freeman 1984, 1994; Donaldson and Preston, 1995; Jones and Wicks, 1999). These authors argue that stakeholders' interests should be treated as 'ends' which possess intrinsic values. Normative theory often uses a narrative approach, seeking to reconcile the 'story' of why the stakeholder's interests are important with the business objective of profit maximisation (Jones and Wicks, 1999). It supports the taking of decision without following due processes of a laid down rules for justification neither does it adopt an obligatory approach in the selection of stakeholders. The normative approach only holds true on a casual basis whether we are thinking of moral, legal, institutional, or prudential justification of action (Alston, 1988). However, this

approach to stakeholder management could be 'dictatorial' and 'expert driven' since it is solely based on the manager's judgement, which could most likely be biased to what the managers' preference. Hasnas (1998) suggests the need from organisations to seek the individual consent of the stakeholders, rather than having to impose an adopted stakeholder approach in an operational process. It therefore suggests the need for further participation and involvement with the identified stakeholders in an operational process.

In contrast, *instrumental theory* emphasises the importance of empirical evidence of stakeholder contribution in terms of engagement with the operational process, or their adjudged contributions to the operational process. That is, if an alleged stakeholder group cannot be proven to have a valid claim to affect value it can offer, then they could not be considered as affected stakeholders (Donaldson and Preston, 1995). The idea of identifying those affected stakeholders by an organisation, but who have little power to influence what that organisation does, is antithetical to instrumental theory. My own use of systems theory later (e.g., Midgley, 2000) looks at the affected as relevant.

Descriptive theory. This explains the conditions under which an individual or a group is considered as a stakeholder in any particular case. In other words, it doesn't say who *ought* to be a stakeholder, on the grounds of moral necessity or instrumental reasoning, but says that this can be decided by local managers accounting for local contexts. Descriptive theory reminds managers of the need to consider the interests of other key partners (beyond   shareholders) that are relevant to the operational process, but offers no general criteria for defining who they might be (Freeman 1984; 1994; Donaldson and Preston, 1995).

Divergent stakeholder theory. This form of stakeholders' theory integrates different stakeholder management ideas. It applies a combination of ideas from different existing theories (e.g. normative and descriptive), in its approach. While it may apply both qualitative and quantitative methods, it recognises the value of both normative guidelines and local context in determining who counts as a stakeholder (Jones and Wicks, 1999).

While the above theories take different approaches to the identification of stakeholders, there are also a small number of integrative frameworks in the literature. Arguably the best known is by Mitchell et al (1997). Mitchell et al, while recognising the various efforts by other authors (e.g. Freeman, 1984; Windsor, 1992)[3] to devise means of identifying and managing stakeholders, note that there is no clear cut theory that offers a universal answer to the question of stakeholder identification. While this observation may attract a debate, on 'whether this is a clear cut stakeholder theory?' It is be noted here that stakeholders' management has passed through stages of development among practitioners and researchers and this is ongoing. This is evident in the various approaches to stakeholders' management highlighted in this thesis could support the opinion that many more approaches to stakeholders management would emerge, especially due to the increasing complexities faced in operations practices.

Mitchell et al (1997), argue that the key attributes of stakeholders are *power* (whether or not the stakeholder has the ability to determine or strongly influence what the

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[3]Windsor (1992) classifies stakeholder theories into 'broad' and 'narrow' categories. The broad theories say that a stakeholder is any individual or group who can affect or be affected by the achievement of an organisation's objectives. In contrast, narrow theories see a stakeholder solely as any individual or group on which an organisation relies upon for its survival.

organisation does), *legitimacy* (whether people believe the stakeholder ought to be listened to) and *urgency* (whether the stakeholder has a burning desire to have a say on what is done). They further argue that managers have a responsibility to recognise and classify stakeholders according to these attributes and their relative importance in the particular context in which the organisation is operating.

Garvare and Johnsson (2010), building on the work of Wheeler and Sillanpaa (1997), classify an organisation's stakeholders into two groups: primary stakeholders, which they say are those who have a direct means of control over what the organisation does (e.g. customers, suppliers, trade unions); and secondary stakeholders, who may not have direct control over the activities of an organisation but could still have some influence (e.g. NGOs, media, fair trade organisations, pressure groups). They note that, in some cases, if the expectations of these secondary stakeholders are violated, they can influence the primary stakeholders to withdraw their essential support for the operations of the organisation, so they should not be ignored.

Donaldson and Preston (1995) highlight the difficulty involved in effectively justifying a stakeholder management framework. This is basically because stakeholders' views about organisational decisions may not always terminate in a unilateral agreement, though this may be rare due to the possibility on compromise among participating stakeholders, based on set boundaries in their interaction process (Ulrich, 1983; Donaldson and Preston, 1995;Yolles,2007). While seeking to act in the firm's best interest, it becomes the responsibility of the Lean manager and the identified stakeholders to make some boundary judgements on who should be included, and to ensure their operational process objectives are scrutinised from the perspectives of their identified stakeholders (Gibson, 2000). This acknowledgement of stakeholder

disagreement and the inevitable responsibility exercised by the manager highlights the difficulty that an organisation may face in effectively grouping its stakeholders as well as designing a suitable approach to managing them appropriately in their operational process.

While Donaldson and Preston (1995) emphasise that the distinctive purpose of the business should be used to determine an effective stakeholder management approach, Wetley and Becerra-Fernadez (2001) note that, as an organisation's business models change (e.g. if the organisation diversifies into different business lines), there is a need to start new relationships with different stakeholders. Thus, managers have the task of continuously developing stakeholder relationships, rather than viewing them as static.

Ackermann and Eden (2011) suggest that an effective balance needs to be struck between the demands of existing operational strategies and perspectives suggested by stakeholders' interests. What needs to emerge is a working approach that would entail satisfaction for both the organisation and the various stakeholders. However, this can sometimes lead to the specification of vague outcomes because, as the environment of the organisation changes and new stakeholders come on board, more and more agendas need to be accommodated: "vagueness regarding the impacts of engagement puts an ongoing relationship with stakeholders in peril" (Spitzeck et al, 2011; pg561).

Loosemore et al (2005) point out that failure to reach out to stakeholders can lead to negative responses and sometimes conflicts that can threaten the operational system. Loosemore (2010) discusses the difficulty involved in reconciling the different opinions of stakeholders, and advises organisations to avoid biases and unfair treatment and try to incorporate a range of views into decision making. Loosemore et al (2005) argue that

the whole essence of stakeholders' management is to try to meet the expectations of these stakeholders and integrate them with the main operational objectives of an organisation (see, Donaldson and Preston, 1995; Emiliani, 1998; Harrison and Freeman, 1999).

Arguably, effective stakeholder management (beyond customers) is underemphasised in operations management theory and practice, especially in the developing world where the implementation of operational philosophies, such as Lean, can be particularly problematic (see later in this chapter). For instance, Sloman (2008) refers to the positive or negative effects of an organisation's operations on stakeholders as "externalities" (pg244-246): i.e. things that the organisation doesn't have to account for because they are beyond its boundaries and can be legitimately ignored. Papadopoulos et al (2011) explore Lean practice in the health sector, using actor network theory.[4] They observe that examining the association between human and non-human entities enhances the understanding of different stakeholder behaviours and responses, which can trigger better decision making to manipulate the operational process to suit the interests of these stakeholders.

Loosemore (2010) observes that operational process issues have the potential to subject stakeholders to threats and other security risks, creating fear in their minds (e.g., suppliers may fear the loss of orders). Fear can lead to mistrust and even open conflict. A practical example in Nigeria is noted by Osagae (1995), who points to the failure of the government and some multinational oil companies in the Niger Delta region to

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[4] Actor Network Theory is an approach to exploring emerging actions and re-actions created as a result of the continual interactions among participants in a socio-technical system characterised by the use of material resources (Latour, 2005; Papadopoulos et al, 2011).

recognise host communities, Non-Governmental Organisations (NGOs) and other key stakeholders who are affected by the operations of these firms. This has resulted to serious conflict in the region. Ibeanu (2000) also describes the conflict between these multinational oil companies and their host communities. S/he notes that a negligent attitude to stakeholder management by business organisations, coupled with marginalisation of their concerns by the government, have caused hardship in the lives of people in the host communities, and this has provoked violence and other criminal actions in the region. This, in turn, has adversely affected the operation of the multinational firms. S/he suggests the need for the government to develop a conflict management approach in partnership with these multinational companies. This can enhance a critical understanding of such conflict; create room for mutual understanding between the concerned stakeholders; and minimise the marginalisation of minority groups in the conflict resolution process. It could lead to devastating effects, like violent protests that always result in destructive actions that can disrupt operational process and constitute threat to human life (see, Watt, 2007).

While the pursuit of value and quality, with the aim of meeting customers' demands via the application of a suitable philosophy such as Lean may yield some advantage to an organisation, especially in terms of reducing resource use, this has to be balanced with the needs and expectations of other stakeholders (see, Osaghae, 1995; Ibeanu, 2000; Zsolnai, 2006). For instance, Vidal (2007) identifies the importance of staff motivation in terms as a medium to harness their support to Lean project which s/he notes can help the Lean organisation in its pursuit of its operational objectives with maximum support of the internal organisation members via effective motivation and involvement of these staff at all levels of the organisation (see, Habermas, 1984; De Treville and Antonakis,

2006). The effective implementation of an organisation's operational approach/es is therefore not just a matter of considering the wider systemic consequences of an organisation's activities; also, it can be of direct benefit to the organisation, as involving stakeholders in decisions that concern them can make them useful allies. Loosemore (2010) points out other potential benefits from consultation with stakeholders, including increased trust[5] and access to valuable information for planning purposes. This argument is in tandem with the submission social scientists. For instance, Habermas, (1970;1984), who proposes the 'theory of communicative action', which supports the idea of participative decision making process which would lead to decisions and actions that significantly reflect the worldviews, and perspectives of the stakeholders affected, rather than imposing expert decision/s on the affected stakeholders of an identified issue of concern. This approach became popularised among authors (e.g. Checkland, 1983; Wilson, 1984; Midgley, 2000; Jackson, 2003; Papadopoulos et al, 2011). This became a foundation for further advancement in learning about the importance of stakeholders' involvement in decision making process.

Ideally, the actions or decisions taken in an organisation should be in line with stakeholders' preferred ways to address each of their requirements, while still pursuing the chosen operational philosophy (Sivilotti, 2009). According to Spitzeck et al (2011), stakeholder management is a tool to assist in building a positive image of an

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[5] Wetley and Becerra-Fernadez (2001) define trust, in this regard, as agreement between stakeholders and the organisation on explicit conditions within a given time frame. However, other authors see trust as an emotional virtue relating to respect towards partners in an established relationship. A major advantage of trust is that it has capacity to facilitate voluntary cooperation among partners (Beauchamp and Childress, 1994; Hosmer, 1995; Frank, 1988; Jones and Wick, 1999).

organisation, which can lead to a competitive advantage and facilitate market acceptance. Bohan (2010) further argues that emphasising Lean without giving due consideration to relationship building with customers and other stakeholders can be problematic, as these people are the ultimate judges of the firm's performance. He notes that effective customer and stakeholder relationship management is a necessity for easy adaptation and success of an organisation's chosen operational approach. He therefore advises managers to always explore every opportunity to consult with stakeholders in the interests of the progress of the organisation. Lamont (2011) notes that this can engender a culture of information sharing between the organisation and stakeholders, which is needed for performance improvement and up to date knowledge of the business environment. "The accuracy of information affects the level of confidence that would be attached to subsequent decisions" (Akintoye et al, 1992; pg107). According to Mason-Jones and Towill (1999), this practice, when adopted throughout an operational process, can lead to improvement of the personal and professional development of partners, which should enhance the overall competitiveness of the entire chain in meeting market demands on time. "Lean behaviour develops as everyone understands his or her role and responsibilities in achieving success" (Searcy, 2012; p41). "A close connection with the market place through shared information enables a more responsive supply chain to be created" (Christopher and Ryals, 1999; pg7).

Looking at internal organisational stakeholders, Jabnoun (2002) points out that their empowerment will not only benefit employees through their participation in flexible decision making processes, but will also position them on a platform of yielding more satisfaction to customers; and humane employment practices can go a long way to ease job stress (Scarbrough and Terry, 1998; Conti et al, 2006). Forza (1996) affirms this

argument, saying that employees are no longer seen as resources who try to resist work, but as people who naturally want to work if the environmental culture is created to give them recognition and achieve collaboration in solving organisational problems.

Majima (1992) takes this argument further, noting that, for the effective take off of Lean practice in an organisational system, the company leadership needs to truly establish an environment of collaboration, believe in the creativity of the employees and seek opinions and suggestions from concerned stakeholders. Atkinson (2004) suggests that "Lean thinking can only exist when we install a thinking and listening culture where process design is created by those who deliver the products or services, not by analysts in an office far removed from where the products are produced" (pg20). Senge (2006) believes that effective organisational learning can contribute to empowerment, leading to a genuine commitment to the overall vision of an organisation and proactive support for its organisational goals.

Empowerment, according to Lean practitioners, promotes a sense of 'belonging' among employees and enables a flexibility of participation which can enhance work performance with minimum supervision. Engaged employees are likely going to be more effective, more satisfied and apparently stay with the organisation (Suraj and Bontis, 2012). Panizzolo (1998) and Shah (2009) reckons this as a major reason for internal stakeholder consultations to change structural relationships. Also see Beddowes (1994), Labbaf (1996), Bowen and Youngdahl (1998), El-Sabaa (2001) and Crocitto and Youssef (2003) for further discussions of collaboration and human capital management. However, Forza (1996) reckons that sometimes organisations tend to prefer stricter measures rather than the participatory approach, in order to address issues like fraud and other challenges, such as poor task completion due to less rigorous

supervision, which could be occasioned by the practice of liberal participation among organisation members.

2.8   Lean in the service sector

Although Lean was invented in the manufacturing industry where men and women work on input materials and process them into finished goods, practitioners in other sectors of operation have adopted its practices as well, in their quest to achieve operational efficiency and elimination of waste. For instance, Kundu et al (2011) found that the practice of Lean has a role to play in the enhancement of all round productivity and commitment of staff in the service sector, with the aim to satisfy the customers, who are referred to as 'service users'. They draw on the ideas of early authors of Lean production (Onho, 1988; Womack et al, 1990) to suggest the application of a bottom-up approach to Lean practice in the service sector, allowing the innovative input of all employees in all departments across the organisation. They believe that such an approach could deliver reduced defects in service to customers, just as was witnessed in the manufacturing sector with regard to products.

Pederson and Huniche (2011) assert that the popularity of Lean in the service sector is largely due to the need for service organisation to meet demands for high quality services while coping with tightened budgets and trying to attract competent human resources. They argue that the practice of Lean in the service sector is a question of negotiation with concerned stakeholders on a platform of efficiency. They note that such negotiations, if properly managed, boost employees' productivity, especially when they are encouraged with the freedom of participation in the negotiation process, leaving them with a mentality of ownership and recognition (see, Papadopoulos et al,

2011). Likewise, Piecy and Rich (2009) found that the involvement of staff in the operational decision making process has a positive influence on the morale of workers in a service organisation.

Barraza et al (2009) talk about how Lean is used in the public sector to improve public services. They say that public sector organisations adopt Lean with the intention of eliminating waste and striving towards perfection in the delivery of public services to customers. They argue that Lean models have led to a significant improvement in public sector organisations' work processes, especially with regard to managerial efficiency and effectiveness in the delivery of services to citizens (see, Arlbjorn et al, 2011; Bhatia and Drew, 2007; Nutt, 2005; Wan and Chen, 2008).

Kollberg et al (2007) found out, in their research on the impacts of Lean initiatives in the Swedish health care system (where healthcare services delivery is the main focus), that Lean implementation was able to address long delays in the operational process. They proposed a 'flow model' to address the identified problem: "waste related to delays, preparation times, referral management and booking procedures were captured in the flow model" (pg19).

Nowadays it would seem like, with increases in the complexity in many business operations, it is arguably difficult to effectively delineate between Lean manufacturing and other forms of Lean practices, like in the services sector. This is because so many manufacturing outfits now provide a mix of products and services, enhancing value in their offerings compared with products alone (see, Baines et al, 2009; Winroth and Johansson, 2011).

2.9   The Practice of Lean in Developing Countries

The above literature on the meaning and adaptation of Lean in operations management has been largely developed in relation to business practices in developed countries, where the necessary basic infrastructure is available. However, the infrastructural requirements for the effective practice of Lean are not always present or reliable in developing countries. This is very relevant for my own research, based in Nigeria.

Gulyani (2001) carried out a comparative study of transportation issues faced by major auto assembly companies in India, and observes that Lean production in that country has been challenged by the slow means of transportation of resources from one place to another, leading to an increase in the cost of keeping inventory, and breakages of input materials in transit due to poor quality roads. This led major companies in the country to consider relocating their manufacturing, incurring high opportunity costs. Opportunity cost is the cost of what is forgone to make a particular choice from alternatives (Palmer and Ralftery, 1999).

Similarly, Olufemi and Oluseyi (2007) see the transportation problem in Nigeria as a complex issue which does not only restricts human capital mobility but could also adversely affect the pace at which goods and services are distributed if managers do not take necessary actions to bring the situation under control. The main causes of transportation problems are due to events such as vehicle breakdowns, extreme weather conditions, human errors, road blockages, armed robbery on high ways and scarcity of fuel (Ubogu et al, 2011). Eti et al (2006) recognise that these challenges have led to poor lead time management, which has constituted a major threat to on-time business operations in many developing countries.

Frimpong et al (2003) found, in their research, that delays in the release of funds had a huge adverse effect on the performance of firms in developing countries, especially in the construction sector. Aibinu and Jagboro (2002) argue that such delays, apart from impacting on the completion of projects, also impose extra costs because firms end up seeking finance elsewhere, usually at higher rates of interest.

Inadequate skills in project management have also contributed to the failure of implementation of Lean in many developing countries. For instance, Odusami et al (2003) observe that the majority of practitioners in the construction industry in Nigeria, especially small scale operators, do not have appropriate professional certifications. They see the lack of professional know-how as a major cause for project failure in the industry. Similarly, Oyelaran-Oyeyikan and Barclay (2004) say that poor human skills development, among other factors, have been responsible for low performance levels among organisations on the African continent more generally. As a result, projects often suffer delays, poor supervision, cost overrun and sometimes abandonment. In response to the issue of poor project management, Lawal and Onohaebi (2010) suggest the need for all stakeholders of a project to ensure that only persons who are affected or have the requisite expertise get involved in planning and execution. This, they say, can help "sanitise" organisations and bring about better performance. While it would not be suggested that all competing interests among stakeholders would end up in a pluralistic decision (unresolved disagreement), it is also noted here that the views about organisational decisions may not always terminate in a unilateral agreement, which could be addressed via the involvement of the affected stakeholders. (Midgley, 2000; Yolles, 2007).

Although many authors in the developed world, such as Womack et al (1990), have emphasised the value of employee participation as vital aspects of Lean practice, many managers in developing countries are yet to fully come to terms with this because there are often cultural barriers to employee participation (Akpotor et al, 1999). According to Akhator (2002), managers in most developing countries, such as Nigeria, assume autocratic leadership roles, or what Seddon (2003) calls "command and control management" (pg16), and sometimes frustrated managers may not recognise that they can tap into the knowledge from their subordinates. This could be due to issues such as personal pride positional differences, and level of education acquired between the manager and the subordinates (Bontis, 2001). As a result of this, a lot of organisational policies restrict subordinates' participation in major operational decisions. This could be traceable to the interest in their 'position power' to control operational process.

This complicates communications between top level management and shop floor staff, especially on issues that are of technical concern to the organisation. In the case of Nigeria, this is a major cause of business going out of control (Seddon, 2003). Akhator (2002) believes that autocratic management and restrictions on employee participation have contributed to poor communications between senior managers and subordinates in Nigerian work places, adversely affecting industrial performance. These have led to unnecessary errors and misunderstandings amongst internal organisation members, due to "irrational" operational practices, which can impact adversely on productivity (Mohamudat, 2010).

Pettersen (2009) points out that issues such as this can potentially make Lean practice problematic, saying that Lean is underpinned by a participatory philosophy with emphasis on the contributions of shop floor workers who are directly involved in the

implementation. If this is not considered appropriate by managers in a country like Nigeria, in all likelihood managers will be put in a position of devising Lean processes in a non-participatory manner. These will then be imposed on staff, who will not fully understand the rationale for them and therefore will either resist implementation or implement sub-optimally.

Looking at Nigeria specifically, all the above issues apply. Also, other concerns raised in the literature on Lean in Nigeria include the challenges of environmental impacts of production processes, an inadequate power supply, criminality (especially high levels of armed robberies, kidnapping and corruption), poorly organised markets and an inadequate road network (see Anakwe, 2002; Okonjo-Iweala and Osafo-Kwaako, 2007). For instance, Ogowewo (2005) focuses on the weakness and slow pace of the Nigerian judicial system. He observes that it takes longer than necessary to get justice from the court system and, as a result, many people have taken undue advantage and defrauded others in their business relationships. These makes it difficult to establish the needed trust for strong business relationships, as contracts among partners are frequently dishonoured (Dike, 2010).

 In another example, Osagie (2002) reckons that high levels of mistrust usually result in people hoarding vital information and not disclosing it to partners, which further reduces trust. S/he also sites cultural differences and linguistic issues as major threats to business relationship building: Nigeria is a multi-cultural and multi-lingual society, where people cannot even assume that they have a common language with which to negotiate deals. When partners do not speak the same language, misunderstandings and ambiguities can abound, which hinder the free flow of information even more. This is in sharp distinction to what is observable in Toyota, Japan (arguably the foremost

practitioner of Lean philosophy), where the use of a common language has been linked to the facilitation of a common purpose among partners who are used to the same culture, and are involved in a concerted joint effort to achieve set Lean objectives (Taylor, 1997).

These issues seem to have pushed many Nigerian organisations to incur additional costs in their bid to sustain their operations and deliver on market demand. Ikelegbe (2005a) notes that almost every business operating in the Niger Delta region of Nigeria has the responsibility to shoulder additional costs to organise extra security to protect their assets, in addition to paying via taxation for the police, customs and the army, due to the wide spread occurrence of violence and other criminal activities.

Elsewhere, Lee (2004), acknowledging these quality issues, notes that, amongst other measures, creating the right alignment with input suppliers would go a long way to help partners in ensuring that only the right products and materials are circulated within supply chains. This will help them overcome movements of substandard materials and sustain the goal of customer satisfaction. Given the need among practicing organisations in the developing part of the world, it would suggest that the gradual adaptation to approaches such Lean could provide solution/s to address operational issues, in the midst of these challenges, though the implementation of such approaches would need to give adequate attention to the prevailing context.

Some management authors subscribe to the argument that, despite these challenges, developing countries should still adopt modern business philosophises such as Lean in their operations. For instance, Amoako-Gyampah and Garegeya (2001), in their research on JIT practice in the Ghanaian manufacturing industry, observe that many of

the challenges to JIT implementation found in developing countries are also found in the developed world too; especially barriers to employee participation, cooperation between suppliers and organisation. They note that the same need for mutual understanding between stakeholders and alignment of effort towards success exists in both the developed and the developing world, in spite of the infrastructural and cultural issues mentioned above. My own position on this is that there are indeed *some* similarities, in the sense that all companies in free market economies, regardless of where they are situated, have operational processes and seek to sell to customers while keeping costs at a reasonable level, so this justifies looking at Lean as a realistic prospect in Nigeria, especially in the critical sectors of the economy such as the food production industry, focused in this research. However, the contextual issues found in the developing world, and discussed above, cannot be ignored if implementation is going to be successful. This might mean that Lean will need to be reinterpreted, or even re-invented in some circumstances, to be fit for purpose. As it would be argued later, in this thesis, the addition of Systems Thinking can help address some of these contextual issues.

The next section will present a critical reflection on Lean. The discussion of the context of developing countries already raises issues with it, but there have also been critical voices in the developed world.

2.10 Critical reflection on Lean philosophy

A common observation that is often made by commentators is that Lean managers deal with *people* (e.g. employees, customers and others), who may have different influences on the operational process of value creation, and may be seen as stakeholders of various

magnitudes in relation to the operational process (Bertelsen and Koskela, 2004; Hines and Lethbridge, 2008; Bryde and Schulmiester, 2012). It is therefore an important requirement for the Lean managers to understand these stakeholders to work towards meeting their expectations.

Moreover, it is reasonable to conclude that, although Lean is basically meant to achieve effectiveness and efficiency via different approaches with the intention to achieve waste elimination, its implementation in each of the different sectors comes with certain filtrations that make its application unique to each sector. This is because the philosophy of Lean tends to involve a pragmatic, multi-dimensional approach that encourages managers to draw upon different management practices and integrate them into a system of operation (Shah and Ward, 2003). However, there can be case of conflicting effects which could pose a challenge to the combination of these approaches due to contextual issues, such as differences in stakeholder's perceived values. For example, standardised operational processes in health care delivery can be difficult to achieve. So, a best practice approach, with the aim of delivering optimum services to health care service users while striving to minimise waste while recognising the affected stakeholders, could be more likely to be successful (Papadopoulos et al, 2011).

Katayama and Bennett (1996), in their research on Lean practice in the Japanese context, conclude that, in cutting back so-called 'waste', Lean organisations may remove the capacity to adapt to changes in demand for their products and services. Flexibility is therefore as important as efficiency, especially in changing market contexts (Mason-Jones et al, 2000). The issue of waste can also pose a challenge to managers as it can become difficult to establish what constitutes waste in an organisational operations process where flexibilities need to be maintained. What may

be termed as waste today may be much-needed capacity in the near future, due to a rising issues, which could influence the perceived judgement of what constitutes waste by the stakeholders to an operational process."…all moral judgements are spatially and temporarily located" (Midgley, 2000: p207; Ufua et al, 2014). This could be due to the forces of influencing factors such as the perception, which determine the stakeholders' judgement per time on waste. This observation tallies with the suggestion of Crosby (1995), who suggests an effective practice of Zero waste operations via a structured consultation with the 'involved stakeholders'- who are parts of the process. S/he however focuses his/ her argument on the production of quality goods and services from an operational process while acting collaboratively to avoid waste. This narrow approach to waste management could constitutes a limitation to effective waste management process which could also exclude some vital stakeholders who could be affected. As a result of this limitation, the combination of Lean and Systems tools is applied in this research in order to account for the impacts on both the involved and the affected stakeholders (see later sections of this thesis).

Furthermore, Radwabdeh (2005) cautions that care needs to be taken as the effort to eliminate one identified waste can have negative impacts on the other functioning parts that form the operational system of an organisation. Arguably, this calls for a system approach to Lean practice in an organisation, to enhance managers' 'bigger picture' understandings and therefore design more appropriate waste elimination processes. This prescription is supported by the findings of Papadopoulos et al (2011), who recognise the actor-network as a foundation for absorbing turbulence in the Lean operational process, and encourage a focus on the co-creation of value.

2.11 Criticisms of Lean practice

While Lean has been promoted by some writers as unambiguously good for business practice, especially in the area of labour productivity in an organisational system (White et al, 1999; Shah and Ward, 2003; Achanga et al, 2006; Moyano-Fuentes, 2012), Arnheiter and Maleyeff (2005) express concern about simplistic interpretations. They caution that Lean should not be misconceived to mean the prescription of standard organisational practices, especially the unnecessary laying off of employees in an attempt to eliminate waste, or failure to keep vital inventory that could be useful for smooth operations.

Another issue is that the implementation of Lean tends to have been widely practiced with relatively narrow stakeholder participation (mostly employees and customers), which means that a few stakeholders have a significant influence and others may be marginalised. This may become a challenge to the effectiveness of Lean in the face of complex issues in an operational process when there are diverse stakeholders.

According to Cooney (2002), most writers and practitioners neglect the influence of other key sectors such as socio-political institutions, host communities, government agencies and financial markets. Moreover, it is important to note that in certain instances, some stakeholders could be affected by an operational process but not involved directly with the operational process. And, due to the negligence of the organisation, the neglected but affected stakeholders could influence the key stakeholders to issues such as protest. It is important for Lean in terms of looking at its wider impacts in organizations and society (Ulrich, 1983; Oluwaniyi, 2010). This observation critically informs the proposed research, which has the aim of exploring

what systems approaches involving multiple stakeholders can contribute to the development and practice of Lean in the Nigerian context.

A number of other scholars, beyond those writing from a developing countries perspective, have also criticised Lean practice. Towill and Christopher (2002) note that, despite the huge impact that Lean can have on an organisational process, it seems to work better in an environment of relative stability, where variety is low. Similarly, Lee (2004) observes that, although organisations may seek to pursue efficiency in their operations via the practice of Lean, this may lead to unnecessary rigidity in their operations that would pose a hindrance to the needed operational flexibilities (an aspect of variety) to handle market changes. Similarly, Mason-Jones et al (2000) believe that Lean may not be efficient in meeting customer needs in a volatile market where there is high variety in terms of customers' requirements. Variety refers to the range of different products or services produced from an operational process at a given point in time.

Towill and Christopher (2002) say that Lean may cause difficulties when there are inadequate supportive logistics on the ground, and when it introduces a lack of adequate flexibility and therefore obstructs the aim of meeting customers' requirements, especially during peak periods of high demand and variety. They explain further that, at its best, Lean supports products or services with mass appeal, which therefore makes it rigid in terms of meeting more dynamic market demands. Its approach seems to lack the robustness needed to manage unpredictable changes in the business environment (Burgess, 1994; Towill and Christopher, 2002; Wadhwa and Rao, 2003; Jain et al, 2008). If "...Lean production fails to account for the pressure on management, then its claim to universality can be questioned" (Cooney, 2002: pg1145). "Under the concept of Lean production, workers have to deliver the service in a limited time, while

customers who do not fit in the standardised patronage are left behind with complaints" (Spithoven 2001, pg734). It therefore seems that most things have to be foreseeable and reliable for an effective and sustainable Lean practice to be achieved, and arguably this is often unrealistic due to unpredictability in business environments (Forza,1996), especially in developing countries such as Nigeria (as I argued earlier). Also, in an era of increasing 'servitization', where products and services are paired in synergistic packages in response to individual customer requirements (see, Baines et al, 2009; Winroth and Johansson, 2011), the above rigidity could become increasingly problematic.

Furthermore, Pederson and Huniche (2011) criticise Lean from the perspective that its application could result in an organisation's human resource becoming unduly exploited, given that fewer people doing more work is one way to cut costs (at least superficially, although overburdening workers can lead to increases in error rates and therefore increases in costs again). Hines et al (2004), while observing that this claim may lack adequate support from practitioners, nevertheless advises organisations to complement their implementation of Lean with policies that strengthen, rather than undermine, their human resource capabilities.

Crooks (2012) concludes that there is one central feature of Lean that is quite distinctive, which is its stressful impact on staff at all levels when they become more focused on raising performance and increasing efficiency. Moreover, the use of a smaller workforce, which is aimed at promoting the multi-skilling of staff (i.e. handling a diversity of tasks via job enrichment), can lead to deflated employee morale and poor individual work performance due to an over concentration on team working (Forrester, 1995; Hossain, 2004; Sawhney, 2010).

Cooney (2002) argues that the practice of multi-skilling in the process of Lean implementation can pose a threat to specialisation and can also lead to inefficiencies, if not carefully monitored. This is because, in some contexts, the involvement of an individual worker in several unrelated tasks can lead to inadequate learning of those tasks, poor finishing and ultimately customer dissatisfaction. Moody (2011) reports that the attempt to implement multi-skilling in the health care industry has been faced with legal challenges in the USA because over-stretching the learning capacities of staff can represent a threat to human life. Although Lean managers claim that multi-skilling is meant to achieve greater productivity, Cooney (2002) notes that what is said to constitute productivity in most operational processes does not account for time and resources spent on dealing with unavoidable complexities and environmental perturbations that affect the operational process. Therefore, workers may be penalised for dips in performance when they have been tackling issues that, if ignored, may have caused a far larger threat to the operational process. Conti et al (2006) observe that inherently stressful practices, like multi-skilling, can lead to regrettable mistakes, slowed pace of work and sometimes unintended wastages. However, these authors do not argue against multi-skilling; they just urge managers to seek to minimise the stress it engenders.

Forza (1996) expresses concern, arguing that horizontal collaboration (people at the same level of the organisational hierarchy working together) can form a breeding ground for fraudulent practices that may be difficult to uncover by management if adequate measures are not put in place to monitor the operations of teams. Issues such as this might usefully be tackled using boundary critique (Churchman, 1970; Ulrich, 1983; Midgley, 2000), which can subject the boundaries of teams, and relationships

between stakeholders, such as employees and managers, to scrutiny. This may be an aid to ensure all round accountability and effective operation. An explanation of boundary critique is presented later in this thesis.

2.12   Other related models to Lean Practice

2.12.1 The Need for Agile Organisational practice

As a result of the weaknesses of Lean operations discussed above, an organisation may resolve to restructure its operational system to meet its target market by practising agility. Burges (1994) notes that agility is a new business paradigm which has no clear boundaries in its definition or application, due to the dynamic nature of its development in business practice. As with Lean, there are a variety of definitions of agility in the literature. Authors (e.g. Wadhwa and Rao, 2003; Slack et al, 2006; Slack et al, 2007; Slack et al,1998), see agility as the ability of a business operational process to respond to changes in market requirements at low cost. They differentiate agility from flexibility, saying that flexibility deals with predictable operational changes in the business environment, while agility is concerned with unpredictable changes. Others note that agility seeks to go beyond mere flexibility to enhance a proactive approach to managing volatile business environments to the advantage of the organisation (see Sanchez and Perez, 2005; Zhang et al, 2006). Christopher and Towill (2000) observe that agility is a business-wide practice that affects the entire system of operations in an organisation. It requires a structural realignment of the operational process to allow the needed internal resilience to respond to external changes, giving advantage to the organisation (see, Mason-Jones and Towill, 1999).

It is interesting to note that the absolute separation of Lean from agility can be difficult in some circumstances. This is because many organisations that choose to adopt Lean to cut costs also have to become agile in the realities of their operational processes as they seek to adapt to emerging requirements from their stakeholders (Christopher, 2000).

2.12.2 Zero Waste Concept

Another related discussion to Lean is of 'zero waste'. Effective operational waste disposal has become a general concern to operations managers and researchers. Many have suggested the use of land fill in the past, but recent events have shown that landfill poses additional threats to humankind in terms of pollution, financial cost to society and the opportunity costs of allocating land for this purpose (Hokkanen and Salminen, 1997; Lahdelma et al, 2000; Merkhofer and Keeney, 1987). Some commentators have suggested the 'zero waste concept' in an attempt to tackle the challenge of effective waste management in our society, which involves the finding of value in waste that can lead to further benefits. The idea is for an 'ecosystem' of industries to use each other's waste as input raw materials, theoretically eliminating waste altogether (although in practice it is usually the case that some waste have no commercial application despite attempts at designing new products and services around them) (see, Onwurah et al, 2006; Oyeniyi, 2011; Ekanayake and Ofori, 2004). Many national government agencies, such as the United States, Taiwan, Croatia and South Africa, have adopted its practice successfully (see, Matete and Trois, 2008; Young et al, 2010; Schneider and Bogden, 2011). This is an extension to conventional organisational practices such as Lean. Whereas waste minimisation or elimination focuses on the reduction of waste in a single organisation, the zero waste approach is meant to create value from identified waste materials, and that value might be exploited by the original organisation or, more likely,

a partner organisation. It is aimed at reducing the pollutants within, and emanating from, landfill sites, and helps to avoid the incineration of waste (Bond, 2012).

Some authors (e.g. Clapp, 2002; Zaman and Lehmann, 2011) have observed that zero waste has been widely practised, as part of operational process objectives among organisations. However, in Nigeria it has been taken further to include the involvement of stakeholders (e.g. host communities), especially in the Niger Delta, with the aim of achieving a pollution-free environment. The actual reuse of waste in the Niger Delta is handled by practitioners in private industries (Sharma and Henriques, 2005). Ogbonna et al (2007) researched this and concluded that even greater efficiency could be obtained by privatising all the waste management services in the Niger Delta region, rather than just allowing private companies to take in resources ('waste') from public sector organisations. Zero waste in Nigeria is arguably an improvement over landfill management (in the case of solid waste), which previously was associated with environmental pollution (including the release of greenhouse gases) and unpleasant smells, which offended local communities (Agunwamba, 1998).

Arguably, this operational model can build on the efficiency and productivity objectives that Lean philosophy stands for (Womack et al, 1990; Barraza et al, 2009), not least because it does not limit the reuse of waste to a single organisation: the more organisations that are brought together into an 'industrial ecosystem', the more potential for reuse and value creation there is. However, Matete and Trois (2008) argue that the participation of affected stakeholders within single organisations and across the industrial ecosystem is essential to its success. While Radnor et al (2012) argue that Lean focuses on value creation which ultimately leads to waste reduction and elimination in an operational process, Schneider and Bogden (2011) recommend that a

critical assessment of the operational environment is undertaken before anyone tries to implement zero waste plans, and I suggest this is necessary to ascertain whether the required participation is likely to be forthcoming.

2.13 The application of Systems approaches Alongside Lean

Having discussed a range of complementary practices to Lean, we now come to Systems Thinking, which is a key focus of this thesis.

The practice of Lean is essentially a process improvement philosophy, aiming to enhance value through identifying and eliminating waste, via the use of various tools. As discussed earlier in this chapter, the practice of Lean tends to hit limitations in operational contexts characterised by dynamism and complexity, where customer and other stakeholder requirements might not be clear or might change rapidly (Mason-Jones et al, 2000; Towill and Christopher,2002). As noted earlier, Lean tends to focus mainly on a fairly narrow range of stakeholders, usually involving suppliers, the internal organisational members and customers, but leaving out other affected stakeholders that may be affected by the Lean process (Spithoven 2001; White et al, 1999). Indeed, when it comes to issues like carbon emissions and global warming, a 'stakeholder' could be the whole planetary system, which might require representation by an advocate in some kind of stakeholder participation exercise for the issue to be seriously considered. Such an observation raises the question of whether Lean is really sufficient, on its own, to address some of the more complex and dynamic issues facing business organisations, especially when multiple stakeholder views become relevant? My view is that the organisation and the affected stakeholders stand a chance to decide this.

Another, related issue comes when we look specifically at the Nigerian context. As argued earlier, Nigerian industries are faced with significant challenges that are not so common in the developed world, such as an inadequate road network, power cuts, criminality poorly organised markets, and security (Okoroafo and Kotabe,(1993; Ibeh, 2004; Okafor, 2007;Okonjo-Iweala and Osafo-Kwaako, 2007; Okafor, 2008). These issues greatly increase the complexity of the operational environment, and we have already seen that complexity poses questions for traditional Lean approaches.

These issues lead me to look elsewhere for ideas that are better able to help managers address complexity and support wider stakeholder engagement, but without losing the central focus on Lean. The field of Systems Thinking has long been viewed as one that is strong on complexity management (Flood and Carson, 1988). The question for this research is whether the use of Systems tools alongside Lean can enhance its application in the Nigerian context?

System thinkers start with the assumption that "everything in the world is directly or indirectly connected with everything else" (Midgley, 2008, pg55; Midgley, 2011, pg8). Jackson (1991a) examines sociological systems theory (e.g. Parsons, 1956; Buckley,1967; Spencer, 1969), noting that an organisation is a complex system made up of interrelated parts which form the system and interacts with its environment. It therefore needs to pursue relationship building as part of operational objective that enhance its approaches to addressing the complexities in its environment if it is to avoid unanticipated, negative consequences from interactions it is not properly aware of (see, Eden, 1995; Eden and Ackermann 1996).

This way of seeing organisations suggests that it is too limiting to think of modern organisations as solely concerned with efficiency or productivity, mainly focusing on the use of material inputs and internal human resources that count; with minimum concern for the environment and other stakeholders, though not directly involved with the immediate operational process (Galloway, et al,2000): Systems Thinking suggests the need to pay attention to wider social relationships with stakeholders within the organisation. The organisation is necessarily required to consider what matters to those stakeholders (both beyond and linked to efficiency and productivity) if it is to maintain positive relationships. However, such wider relationships has produced complexities in today's business relationships, demanding the application of multiple approaches to address (see, Gregory, 1996; Jackson 2000; 2003, Midgley, 2000). As noted earlier, this issue is not centrally addressed in the Lean literature, with most applications including only narrow stakeholder participation (see, Taylor and Taylor, 2009). While Lean authors have certainly emphasised that Lean is applied to 'operational systems' (Liker, 1997). Considering different models that encourage active interactions among the system's components, it is noteworthy that more sophisticated systems concepts and methodologies are scarcely used by Lean authors, except a few such as Seddon (2003, 2009) and Gregory (2007).

It is thought here that, with the application of Systems Thinking alongside Lean, adequate consideration of wider stakeholders' perspectives could be achievable, making an operational system better able to appreciate and respond to the complexity of its environment. Such stakeholders may be viewed as being outside the organisational system as conventionally defined, but their input to that system could be crucial to its survival (Daellenbach, 1994). However, emerging trends of operations management has

showed that stakeholders' expectations and environmental influences on an operational process have remained unstable, meaning that the development of operational approaches (e.g. the critical systems thinking). It presents a continual task for both managers and the stakeholders, in an operational process (Midgley, 2000; Taylor and Taylor, 2009; Ufua et al, 2014).

It is therefore a proposal to combine Lean and Systems in my research process in the Niger Delta region of Nigeria. This is because modern operational approaches such as Lean tends to be relatively new, and Systems Thinking tends to be largely unknown among researchers and practitioners in the region. It may be an advantage in the Nigerian context, prompting new learning as there are unlikely to be deep understandings of Lean and Systems thinking amongst managers, especially in the food production industry, where this research is focused. Of course this is not to say that there won't be entrenched understandings and cultural norms of management in general that could embrace practices such as team work, but at least the traditions of Lean itself are unlikely to be a barrier.

Seddon and Caulkin (2007) found strong evidence for the value of linking Lean and Systems Thinking in the service sector, noting that the original Lean practice from Toyota was born on a platform of 'systems practice' which gave due recognition to stakeholders input (e.g. suppliers, internal organisational members and customers) and activities connected to the production process, which they note is supportive to its success (see, Ohno, 1978). This establishes a precedent, outside the Nigerian context, for the idea that Systems Thinking can be supportive of Lean to deal with complexities. Nevertheless, the Nigerian context potentially poses a different order of complexities due to the major infrastructural and social issues mentioned earlier.

2.14   History and Development of Systems Thinking

While many authors have given different accounts about system theories and ideas, and have suggested different approaches to their application to social systemic issues, Midgley (2000, 2003a) provides a classification of the developmental stages of system thinking and its application to management into three 'waves'.

2.14.1   The First Wave

The first wave started in the 1950s, although previous systems ideas, not applied to management, were already in existence (Jackson, 1991a; Midgley, 2000, 2003a; Midgley and Ochoa-Arias, 2004). Its application was built on the basic assumption that systems are real world, goal directed entities. It was characterised by the use of quantitative modelling techniques to solve social and organisational problems with the aim of addressing given purposes in an optimal manner. The approach of first wave system thinking can be summarised, very crudely, as follows:

- Define the system of concern

- Define the system's objectives

- Manipulate the system to meet these objectives (Checkland, 1985).

Popular among methodologies used during the first wave was systems engineering, which was developed to explore the impacts of change on the entire organisation's behaviour, embarking on a redesign using quantitative methods to achieve the set purposes of management (Hall, 1962; Jenkins, 1969). Systems engineering was seen to be necessary because of the recognition of the importance of external environmental factors, which led to continual changes that organisations needed to adapt to. However, Blanchard (1998) observes that, when using systems engineering, the intervener needs

to clearly spell out the parameters of the intervention and the compatibilities between systems engineering and the existing approach of the organisation, in order to enable the implementation of set objectives.

Systems analysis was also used during the first wave of Systems Thinking to systematically examine alternative operational strategies using a risk management approach and suggest a course of action. It is basically concerned with the understanding of the interactions between parts (subsystems) of an organisation, and the development of improvements to the performance of necessary work (Semprevivo, 1976). According to Fisher (1971), the need for appropriate utilization of available resources leaves the intervener (either a manager or a consultant) with the task of making relevant judgements, taking an objective perspective on options and opportunities, in order to recommend the best course of action. Although objectivity is said to be required, because the organisation also needs to adapt to a changing environment that includes stakeholders, the practice of systems analysis places a demand on the intervener to design a productive intervention that considers stakeholders' perspectives. Fisher acknowledges the observation, which became central to the work of later system thinkers (e.g., Checkland, 1981; Ackoff, 1981), that it can be difficult to arrive at a unanimous view on strategic options and appropriate measures due to differences in the objectives, contexts and timescales that are important to various stakeholders. Wu and Wu (1994) summarise the main idea of systems analysis as understanding the system in terms of the relationships between its parts and the external environment; uncovering problems; and recommending working solutions from a set of alternatives.

During the first wave of Systems Thinking, people also began to use the Viable System Model (VSM) to diagnose and design solutions to organisational problems. The VSM is said to have been developed by Stafford Beer over a long period, starting in the 1950s, but was popularised in the late 1970s and early 1980s (see, for example, Beer, 1979; 1981, and 1985). The model applies cybernetic principles to diagnose systemic viability: i.e., the capacity the organisation has to respond to its often changing environment (Beer, 1984). Beer believes that the model is applicable to any (both small and large scale) organisational systems, since its approach claims that a system is made up of parts, and that the viability of each of the parts can be understood in the same terms as the viability of the whole. The idea that systems are nested within one another is referred to as "recursiveness" (Beer, 1979; pg73; Beer, 1985; Ulrich, 1994, pg347).

The VSM is divided into five functional elements (systems) which are interconnected via information and control loops. System 1s are the parts of the operational system that are directly involved in the implementation of the organisation's purpose. There may be just one system 1 or many. System 2 is meant to coordinate the activities of the system 1s to avoid unnecessary conflicts between them. System 3 has the function of controlling and interpreting the policy of top management. It allocates resources to the system 1s and audits the operational processes of systems 1 and 2. System 4 coordinates the flow of internal and external information, ensuring awareness of the organisation's changing environment and checking that the organisation has the capacity to respond appropriately. System 5 is in charge of policy making. It responds to the information from systems 1, 2, 3 and 4 to make policies to suit the context (Beer, 1985; Flood and Jackson, 1991).

In spite of the fact that the VSM recognises the existence of interactions between the organisational system and its environment, critics claim that its application tends to be too rigid and may not suit turbulent changes in business environments (Jackson, 2003). Ulrich (1994) argues that the autonomy emphasised at each level of recursion in the VSM may not be practicable due to differences in contexts: he observes that some subsystems may require centralised control while others may require a combination of central and local direction, rather than the subsystem autonomy emphasised in the VSM. Also, the VSM focuses on viability and is said to neglect vital ethical issues: the organisation may end up doing ethically questionable things more effectively (Ulrich, 1981).

Although the first wave of system thinking was said to have constituted a good foundation to further the development of the field, and there were some successful interventions, its methodologies were generally criticised for inadequately accounting for the full significance of stakeholder perspectives (Jackson, 1991a). According to authors (e.g. Checkland ,1981; Habermas, 1984; Midgley, 2000), a problematic assumption of the first wave of systems approaches was that they tended to take for granted predefined goals, usually set by management. The first wave of system thinking therefore only embodied a very limited approach to stakeholder engagement, imposing a narrow, predetermined agenda on stakeholders regardless of their views on this. Stakeholders were generally regarded as objects to be manipulated to suit the purposes being pursued.

While some managers in today's business management would assume this practice under the caption of autocratic leadership approach (Byham et al, 2002; Tate, 2009), writers refer to the first wave of Systems Thinking as "expert driven", as its approaches

mainly applied quantitative techniques in addressing organisational problems, and these approaches were not always well understood by managers. In addition, first wave techniques sometimes bypassed the problems that were actually experienced by managers and other stakeholders, as they force those problems into a frame that the techniques could address (e.g. Jackson, 1991b; Midgley, 2000; pg197). This all happened because the assumption of objectivity puts the intervener/s in a position of largely unquestioned authority.

Essentially, the account of the first wave showed that it had little capacity for constructively working with multiple stakeholder perspectives. Gregory (2007), from the Lean research community, has likewise expressed disappointment with approaches that dictate solutions to practitioners in an operational system, noting that external experts usually do not understand the issues to be tackled as well as the practitioners who are both involved with the process and affected by the systems they manage. All these criticisms of first wave systems methodologies led to the use of a more participative approach to identify and address issues. This has informed my own choices of approaches in my intervention, to be discussed later.

In response to these weaknesses, systems practitioners have accepted the challenge to develop new approaches to address systems and social issues, with more sophisticated procedures that incorporate consideration of the interests of those affected by systems (key stakeholders beyond the involved) (see, Jackson, 1991a; 1991b). Hence the second wave of Systems Thinking development was born.

2.14.2 The second wave

As a result of the failure of the first wave of Systems Thinking to fully recognise the importance of stakeholders' contributions, the second wave (sometimes called 'soft systems thinking') was born in the early 1980s. The basic idea of the second wave was relationship management, with the intention of establishing meaningful engagements (i.e., not overly predetermined by an existing agenda) with an organisation's internal and external stakeholders. "...It is basically concerned with the nature of human understanding and value judgement" (Checkland, 1985, pg762). It applies different approaches to identify and structure complex problems and develop systemic strategies to address them, while treating human beings as active participants in the intervention process, rather than as objects to be manipulated (Platt and Warwick, 1995; Checkland and Winter, 2006).

An example of methodologies used in the second wave era is Strategic Assumption and Surface Testing (SAST). It was developed by Mason and Mitroff (1981), and it focuses the managers' attention on the relationship between the participants (those affected) and the systemic problems being diagnosed. SAST was developed to address the weaknesses of first wave approaches to solving complex organisational problems (Mitroff and Emshoff, 1979). Stakeholder involvement is placed centre stage to construct a fair decision making process that involves participatory deliberation on alternative strategic options (Flood and Jackson, 1991). This brings in the notion of the inter-subjectivity of the final decision; while objective evidence might be used by participants to bolster their arguments, there is no pretence that the final decisions are anything other than inter-subjective agreements (Mason and Mitroff, 1981). Participation in a SAST process involves stakeholders in a structured discussion to

explore different worldviews held by participants about alternatives approaches to solving a complex problem. This encourages oppositional debate among concerned stakeholders, ultimately leading to a search for a synthesis of the competing positions, or even an entirely new, emergent solution. "The conflict created during the debate will be more effective for synthetic planning" (Cosier et at 1978; pg1483). Cosier (1981) further remarks that cognitive conflict is needed to help avoid poor problem identification, challenge taken-for-granted assumptions and encourage the search for alternative solutions. This helps to make a final decision more acceptable to all participants engaged in the process, as they have an opportunity to learn from the debate and experience the process as fair compared with usual processes of autocratic decision making (Mason and Mitroff, 1981).

Basically, the SAST approach to problem solving is based on the following principles (Mason and Mitroff, 1981; Shrivastava and Mitroff, 1984; Flood and Jackson, 1991):

➢ Adversarial- it is assumed that organisational problems are mostly ill-structured and alternative perspectives need to be considered in reaching conclusions about how they should be addressed (Mitroff and Emshoff, 1979). While these authors talk about ill-structured problems, Flood and Jackson (1991) nevertheless argue that, if it is possible to set up an adversarial debate, then there must at least be sufficient clarity to define opposing positions. SAST appears to be dependent on this minimal level of clarity.

➢ Participative- all concerned stakeholders are involved in groups based on their different interests in the problem situation identified.

➢ Integrative- the different positions held by different stakeholder groups must be brought together in order to synthesise a plan of action that everybody can agree to take forward.

➢ Managerial mind supporting- the managers of an organisational system who have a deep knowledge of its operational policies have to take ultimate responsibility to merge the synthesised plan with the existing set operational policy objectives of the organisation.

Another approach used during the second wave was Soft System Methodology (SSM), developed and popularly used among authors (e.g. Mingers, 1980; Checkland, 1981; Wilson, 1984; Mingers and Taylor, 1992; Haynes, 1995; Checkland and Poulter, 2006). It was proposed with the aim of allowing members of organisations to develop new ideas as they participate in an ongoing process of exploring purposes and worldviews and projecting further learning. It uses systems ideas to explore problematic situations and it supports stakeholders in deciding on desirable and feasible actions (Checkland and Poulter, 2006). The application of SSM assumes inter-subjectivity: i.e., managers and stakeholders can develop better understandings of how both themselves and others view the world, and acceptable ways forward via interactions on a process of negotiations (Checkland and Scholes, 1990). Such actions could then lead to further deliberations and an iterative cycle of systemic explorations and improvements (Checkland and Scholes, 1990; Midgley, 2000; Ng, 2004).

According to Midgley (2000), a significant advantage of the second wave of system thinking is that it offers the organisation's members the opportunity to become more committed to the entire organisational system: participation counters alienation and

leads to improved 'buy-in'. It also creates space for the creative generation of ideas via the consideration of various stakeholder perspectives in an intervention process (Jackson, 2000). Flood and Ulrich (1990) applaud the breakthrough in Systems Thinking brought by second wave writers in moving the ideals of Systems Thinking away from instrumental control and positivism towards a focus on mutual understanding through the development of an interpretivist[6] paradigm of thinking.

However, the second wave was also criticised on the grounds that it did not create sufficient room for addressing power relations among participants and recognising the importance of minority opinions (Jackson, 1982). Also, the intervener can be part of the network of power relations: Trevino and Weaver (1999), while agreeing that paying attention to multiple stakeholders is important, claim that the intervener has a worldview and this can be influenced by motives other than stakeholders' interests. Second wave systems approaches tend to treat the intervener as a value-neutral facilitator, even though all human beings have values and purposes that can (even unconsciously) influence their actions during an intervention (Jackson, 1991b; Midgley, 2000). Although Checkland (1981) notes that stakeholders' views should be given due consideration, Jackson (2000) argues that stakeholders often have conflicting aims that are not easily open to change, so the ability to define an agreed way forward through the use of a second wave systems methodology should not be taken for granted. He points out the need for the further development of a more sophisticated approach to stakeholder conflict.

The interpretivist paradigm assumes that social realities are subjective and/or inter-subjective, within a particular context (Jackson, 2003; Collis and Hussein, 2009).

Jackson (2003), buttressing his ideas about the first and second waves, classifies the first wave as assuming the functionalist[7] paradigm, which sees sub-system behaviours as functional in the context of larger systems, and therefore focuses on efficiency and effectiveness in adapting to the needs of those larger systems. In contrast, Jackson views the second wave as conforming to the interpretivist paradigm: participants in social relationships are assumed to interact based on their interpretations, which leads to the construction of shared meanings and/or better mutual understandings.

2.14.3 The third wave

As a result of the various criticisms of the second wave methodologies, a third wave of Systems Thinking was launched at the end of the 1980s and is still on-going. While there are a range of third wave perspectives (see Midgley, 2003a, for some of these), one of the most popular among systems thinkers has been Critical Systems Thinking (CST). It applies different methods and approaches to identify and address operational issues (Flood and Jackson, 1991; Flood and Romm, 1996; Midgley, 2000). Midgley (2000) classifies the development of CST into two research pathways:

The first pathway is about how to set boundaries in an intervention, deal more effectively with value conflicts, address power relationships and work out how to overcome marginalisation processes amongst stakeholders. The second pathway is concerned with methodological pluralism: drawing upon methodologies from across the first and second wave systems traditions, and mixing methods when appropriate, to

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[7]Jackson (2003) notes that the functionalist paradigm works with the assumption that everything in a system functions to promote efficiency, adaptation and survival of the system.

create a flexible and responsive systems practice that can be useful in a wide range of contexts. Both of these are discussed in more detail below.

2.15   Methodological Pluralism

Methodological pluralism involves drawing on methods from both the first and second waves of Systems Thinking to enhance flexibility and responsiveness to context. This strand of CST was built on an earlier (pre-CST) contribution of Jackson and Keys (1984). Jackson and Keys propose a framework called the System of Systems Methodologies (SOSM), which emphasises that different methodologies are useful for addressing different types of problem situation. They classify problem contexts according to whether they are 'simple' or 'complex', and they also say that the relationships between participants ('unitary' or 'conflictual'; i.e., whether there is agreement or disagreement) are important to diagnosing the problem situation and selecting the most appropriate methodology. Jackson (1987) later expanded the categories of relationships between participants to include 'coercive'. Subsequently, writers began to talk about combining methods from multiple methodologies to solve complex problems, which overcomes the limitation imposed by a framework such as the SOSM that encourages choice between 'off-the-shelf' methodologies (Midgley, 1989, 2000; Jackson, 2003).

Although the SOSM has been appreciated by system thinkers, it has nevertheless been criticised. Gregory (1992) posits that the SOSM seems to encourage its users to accept only one interpretation of each methodology: the one ascribed by Jackson and Keys (1984) and subsequent writers. This tends to prevent opportunities for further learning about the chosen methodologies by exploring different perspectives on them, and in

particular the framework discourages the advocates of the methodologies from learning across paradigms (see Sterman, 1994, for an example of cross-paradigm learning, as he reinterprets a first wave methodology, System Dynamics, in second wave terms).

A particularly important criticism of the SOSM is Midgley's (2000) observation that the SOSM reserves boundary critique (in the form of Ulrich's, 1983, methodology of Critical Systems Heuristics) for 'simple coercive' contents only. This is problematic because boundary critique is about exploring the nature of the problem context, and there are real dangers involved in taking for granted the view of the problem context presented by a manager commissioning an intervention: if this manager is engaged in coercion (when being mandated to participate), s/he is unlikely to be open about it, and it will remain hidden unless some boundary critique can be used up-front. This would offer the opportunity of participation to the affected stakeholders and provide a fair ground to define the scope of the set boundaries, in terms of what is shared or discussed based on their agreement, instead of having imposed or dictated decisions.

Even though Midgley (2000) argues that the SOSM is flawed, he nevertheless notes that methodological pluralism offers an intervener the opportunity to draw upon methods originally designed for use in another person's methodology. The intervener/s can interpret these methods in light of his/her own methodology, and to suit the purposes of the planned intervention and in alignment to the issues addressed in the intervention, based on their worldviews. Third wave systems thinkers believe that it is only through the use of pluralism that the limitations of using a single methodology because the weaknesses of one methodology can be addressed through the use of ideas and methods from another due to the complex nature of operational issues (Flood and Ulrich, 1990; Pinzón and Midgley, 2000).

Further discussion of boundary critique and the application of a pluralist approach is discussed in the next section.

2.15.1 Boundary Critique

'Boundary critique' is about comparing and contrasting the implications of different possible boundary judgements in an intervention, in order to inform choices about the inclusion or exclusion of stakeholders and issues in processes of understanding the context and planning to address it (Midgley, 2000). The term was first coined by Ulrich (1996), but was picked up by Midgley et al (1998) and used as a label to consolidate the previous works of Churchman (1970), Ulrich (1983) and Midgley (1992) on exploring boundaries. Foote et al (2007) argue that boundary critique can help in the choice and/or design of appropriate systemic methods; can provide a hedge against marginalisation of the oppressed or those whose opinions are not considered. It can enhance participants' understandings of stakeholder relationships, thereby increasing commitment to an intervention. Midgley (2000) emphasises that the setting and clarification of boundaries is necessary before the choice or design of systems methods because the problem situation could look very different depending on the boundaries chosen. However, set boundaries are subject to changes based on the process of the intervention and the wishes of the interveners at any given point in an intervention process (see, Midgley, 2000; Beers, et al, 2006; Yolles, 2007; Ufua et al, 2014). It therefore follows that an appropriate choice of methods is usefully informed by a boundary critique in an intervention.

Midgley (2000) and Midgley et al (2007) explore some of the theoretical commitments involved in boundary critique, including the idea of the non-universality of human

knowledge: these authors reckon that, when people claim that knowledge is universal, they are ignoring the boundary and value judgements that make the knowledge relevant to a particular context and/or a particular stakeholder perspective.

The exploration of contexts and perspectives gives the intervener/s opportunities to reveal different possible boundary judgements, which can then be discussed with stakeholders, hopefully giving rise to the design of an intervention process that is viewed as fair and acceptable from multiple perspectives. Where agreement on an intervention design is not forthcoming, at the very least the intervener/s is required to justify the point at which discussion is closed down and an earlier set boundary can be re-adjusted or new one/s formed (Ulrich, 1983; 1994; Yolles, 2007). Actually setting a boundary limits the number of stakeholders and the issue focus in order to facilitate a practical intervention, but boundary critique can always be re-opened if new, unanticipated issues and perspectives emerge (Córdoba and Midgley, 2006).

 Essentially, boundary critique encourages ethical systems practice (Ulrich, 1983, 1996; Levick and Woog, 2000). It offers the intervener/s the opportunity to define what is ethically acceptable, within the context of the intervention. It adopts a prime focus on thorough exploration of what improvement might mean in a particular context; as well as underpin it framework on due recognition of the perspectives of participants in an intervention (Churchman, 1970; Midgley, 2000; Córdoba and Midgley, 2006).

A key author on boundary critique is Ulrich (1983), who introduced Critical Systems Heuristics (CSH) into the systems literature, guided by his mentor, Churchman (1970), who was the first to recognise the need for exploring boundary judgements (see, Churchman, 1968; 1971;1979;1987; Churchman and Ulrich, 1980).

CSH is a social theory that addresses issues among participants in social system design. Subsequent writers (e.g., Jackson, 2000; Midgley, 2000) have interpreted CSH as a methodology, but Ulrich (2003) says that it is more than this. It incorporates a social theory of dialogue, and is designed to help people highlight problems of power and refusal to listen to marginalised stakeholders. CSH promotes dialogue between stakeholders, but says that marginalised players have the right to resort to polemic assertion when dialogue is not forthcoming. It has been developed with the intention to allow fair participation for all participants and create room for emancipation of people whose opinions are being suppressed.

Ulrich (1983) believes that social relationships are built on contexts of meaning, which are made up of shared values, beliefs, attitudes, etc. He says that it is on the basis of such contexts of meaning that actions of participants in relationships are judged to be rational or irrational. He goes further to draw on the ideas of Kant (1788) and Churchman (1970). In terms of systems practice (as opposed to theory alone), CSH offers twelve questions built around the distinction between decision makers and those affected by their decisions. These questions can be used heuristically by participants in dialogue, and are centred on "how to do things and what we ought to do" (Jackson, 2000, pg316). When stakeholders answer the questions, 'system rationalities' are created from different points of view. Using CSH is therefore useful for participatory planning when better mutual understanding between stakeholders is needed, especially when those affected by the end decisions need to be involved (Flood and Ulrich, 1990; Midgley, 1997a; Jackson, 2000).

However, CSH has been criticised on the grounds that it is wholly dependent on participative debate (Midgley, 1997a). Some power relationships prevent debate from

taking place. Therefore, while it seeks to provide a way to reveal and challenge power relationships, its means for doing so are still quite limited in terms of the potential for social change in the face of dialogical closure. These issues have resulted in critics concluding that CSH could be redundant in coercive circumstances, and that at best CSH should be applied as a supportive methodology along with others (Midgley, 1997a; Jackson, 2000). Midgley (1997a, 2000) notes that CSH is actually useful for two things: (i) for value clarification within a single stakeholder group, and (ii) as a means for collective consideration of the desired properties of a social system when multiple stakeholders can work together to transcend narrowly defined interests (Midgley, 1997a).

Lee (2007) acknowledges the importance of the boundary concept to operational processes, saying that clarity on boundaries is key to making sure that two or more organisational functions work together effectively. However, Flood and Jackson (1991) express concern about the difficulty in achieving real world delineations of system boundaries. Jackson (2000) adds that difficulties in defining boundaries come about because organisational systems commonly experience uncertainties in their operating environments. Perrone et al (2003) cite changes to organisational culture and individual or group roles as factors that can affect the clarity of boundaries. Singh (1993) observes that role ambiguity can make defining boundaries problematic too. According to Ulrich (1983) and Midgley and Ochoa-Arias (2004), however, the desire for perfect clarity on boundaries is a problem: it leads to taking boundaries for granted and a consequent failure to take a 'bigger picture' view. Instead, if stakeholders explore *different possibilities* for making boundary judgements (an option recognised by Perrone et al, 2003), they can develop greater understanding without ever assuming that this

understanding is absolutely comprehensive (Midgley and Ochoa-Arias, 2004). However, such may not assume the expected process, as there could be need for changes that may demand adjustment of set boundaries or forming new one/s (see, Midgley, 2000; Yolles, 2007).

In the context of Lean, Cilliers (2005) recognises that boundaries are drawn via the various activities that take place within a system. S/he goes on to suggest that boundaries should not be assumed to separate one part of an operational system from another; rather they should be seen as a means to recognise the various constituents of a system: i.e., they delineate parts of a whole, not separate units – the difference being that a whole system is more than the aggregate of its parts due to the fact that the organization of the parts gives rise to emergent properties (von Bertalanffy, 1968). An emergent property might be seen as positive (e.g., excellent products and profit for the organisation) or negative (e.g., stakeholder conflict and waste). "Everything is always interacting and interfacing with others and with the environment; the notions of 'inside' and 'outside' are never simple or uncontested" (Cillers, 2005; pg611). He concludes that initially accepted boundaries need to be revised as time passes by in an intervention process, noting that influential factors such as environmental perturbations can push people to change their boundary judgements. While the recognition by Cillers (2005) that boundary judgements often need to change over time is important, in my view there are limitations inherent in his view that boundaries are primarily drawn via the activities of a system: this ignores the insight of Ulrich (1983) that boundaries can be usefully redrawn through ethical reflection and dialogue between stakeholders. Taking account of both operational activities and ethical reflection can help stakeholders identify and remedy potentially negative impacts of Lean intervention.

Cillers (2005), Gibson (2005) also comment on how boundary judgements need to change over time, pointing out that sometimes the interests of concerned stakeholders can alter a previously set boundary. This could occur at any point in the intervention process, as may be determined by the intervener/s. He gives a practical example where stakeholders initially agreed to localise some activities and later reversed this decision and pushed the boundaries of the system out to incorporate wider environmental activities. Essentially, people working in operational systems are capable of learning over time and need to have the flexibility to adjust their boundaries accordingly (Lee, 2007).

This discussion suggests that, while there are inherent complexities in today's operations management, and it might be useful to draw upon methods from multiple approaches to address them (as recommended by Jackson and colleagues in the third wave of Systems Thinking), the use of boundary critique could also help people working with Lean (e.g. intervener/s), to develop a fuller understanding of the scope of such complexities and prompt the involvement of the affected participants to manage them, instead of relying of expert opinions (e.g. consultant's suggestions) (see, Midgley, 2000). In the systems literature, the two strands of CST (methodological pluralism and boundary critique) were originally discussed as entirely separate ideas by Jackson and Keys (1984) and Ulrich (1983). After the initial attempt by Jackson (1987) to subsume boundary critique within the SOSM, which Ulrich (1993) resisted, the two strands remained in tension until 2000, when Midgley integrated them into a new vision of systemic intervention, where boundary critique is used to explore problematic situations up-front, and then other appropriate systems methods are chosen to address them. It is because both boundary critique and methodological pluralism appear to be

valuable resources for extending the practice of Lean that I have drawn on Midgley (2000) quite extensively in my own research.

Having discussed the development of Systems Thinking and its relevance to other operational approaches such as Lean, the next section is focused on highlighting the research gaps and re- stating the research questions.

2.16   Research gaps and main questions.

This chapter has focused on building an understanding of the practice of Lean, and has established the basis for research on how Lean might be complemented by Systems Thinking, with the aim of developing an enhanced approach that is better able to address complexities and stakeholder relationships in the operational environments of companies, especially in developing countries like Nigeria. The application will be within the food production industry. The overall aim of the research can therefore be captured in the following research questions:

- How could Lean and Systems approaches be applied together in order to improve organisational processes in the food production industry in Nigeria?
- How can the philosophy of Lean be enhanced with the use of Systems approaches to address systemic issues within and beyond the organization in focus?
- What are the challenges associated with this use, and what do these suggest by way of further research?

It is anticipated that the research will give rise to methodological innovations of relevance to Lean philosophy, some of which might only become apparent through

reflections on the action research case study. However, consideration of gaps in the literature (reviewed earlier in this chapter) leads me to highlight two particular opportunities for contributions before the case study:

First, most of the Lean authors cited in this chapter (e.g. Womack et al, 1990) adopt a narrow understanding of who counts as a stakeholder, with a primary focus on meeting customers' expectations as the main operational objective. However, operational issues, especially in regions of developing countries such as the Niger Delta, where this research is based, can be impacted by stakeholders' perspectives which shape their assumptions or relationship with an operational system (Ibeanu, 2000; Ikelegbe, 2005a; Idemudia and Ite, 2006). Therefore there is an opportunity to draw on methodologies and methods of Systems Thinking to widen the understanding and practice of stakeholder engagement.

Second, while Lean is widely accepted as a philosophy for effective waste elimination (Shah and Ward, 2003; Achanga et al, 2006; Moyano-Fuentes, 2012), the prospect of undertaking boundary critique brings a unique opportunity to the fore. One of the priorities of boundary critique is to take people beyond narrow organisational agendas. This is achieved by facilitating a process, to advance further understanding among stakeholders and seeks to develop approach/es (e.g. via prioritisation or selection process), to address identified issues, based on the boundary judgements of the stakeholders at each stage (Córdoba and Midgley, 2008).

The zero waste movement does this within the context of a given 'industrial ecosystem' (see, Sharma and Henriques, 2005; Ogbonna et al, 2007), but boundary critique gives us a broader opportunity to examine a range of interactions between the operational system

of an organisation and its environment by exploring different possible boundaries for analysis, including aspects (such as the impacts of waste management practices on host communities) that are not usually considered within Lean practice. Viewing Lean with a broader lens, and facilitating the exploration of boundaries through discussions of what an organisation *ought* to be doing, thereby going beyond the idea of establishing boundaries through operational activity alone (Cillers, 2005), has never been tried before. These gaps in the literature suggest two more research questions to add to the more general ones presented earlier:

- Is there value in extending the theory and practice of stakeholder involvement in Lean via Systems methodology?
- Can boundary critique add value to Lean?

These gaps and the earlier set research questions would be addressed in the reseat parts of the Thesis.

3 Chapter Three: Research Methodology

3.1 Introduction

This chapter discusses the main approaches to data collection applied in this research. It links the data collection methods[8] and techniques with the main research objectives from Lean and Systems perspectives, as well as applicability in the Nigerian context.

The chapter is structured as follows: first, it provides relevant details about the use of a systemic approach to the Nigerian context, where this work is based. This is followed by discussion of the research approach, involving the adoption of an action research case study intervention. Next are the various data collection methods applied in this research process, and the various Lean and Systems tools applied in the intervention. This is followed by a discussion of the development of Lean and Systems change models related to the intervention and the adopted data analysis procedure. The chapter also explains the evaluation approach chosen for this research work, used in evaluating my intervention.

3.2 The application of an Appropriate Systemic Approach in the Nigerian Context

According to authors (e.g. Hekkila, 2002; Oyelaran-Oyeyinka and Barclay, 2004), the structure of a system tells us how the parts are related. This way of thinking aligns well with the paradigm of Lean, which emphasises concepts such as effective operational approaches and interconnections across the parts of an organisational system. One

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[8]Midgley (2000) defines a method as a set of sequential techniques used to explore a given phenomenon.

important feature of a systems approach is to help us understand how interactions are organised (Cabrera et al, 2008).

A pluralist (third wave) approach is adopted in this research process because it allows the use of a variety of methods drawn from different methodologies to explore and address multiple dimensions of complex situations, such as cultural relationships among stakeholders, differences in language, lack of trust among partners, interactions between business and government agencies, and other factors that could influence the practice of Lean and Systems that may not be known at the start of the intervention, which this research may reveal. Mingers and Gill (1997) explain that, in most cases, organisational problems do not fit exactly with a particular methodology, so a pluralist approach can not only assist with exploring a problem situation, but can also help in discovering where improvements are needed, whether in business organisations themselves, the wider environment (including government and communities) or both (see, Midgley, 2000). Specifically, a pluralist approach can support inquiry into how Lean tools could combine with Systems tools and be most effectively adapted, transformed or replaced to meet customers' and other stakeholders' requirements in the Nigerian context. While this could face challenege/s in its adaptation process, participatory approach would be applied involving stakeholders, via the use of boundary critique. It would be facilitated by interactions with the participants, through the use of data collection methods such as interviews to ascertain what is preferable to these stakeholders on vital issues, such as those to be involved and issue/s to be addressed at each stage of the research process.

Systems authors (especially in the third wave) lend strong support to the belief that complex research challenges can be surmounted by devising relevant strategies in a

pluralist approach to suit the planned research process (see, Gregory,1992; Gregory,1996;Midgley, 2000; Jackson, 2003; Creswell and Clark, 2007).

It would appear that a number of pluralist approaches have been proposed to addressing complex issues (e.g. Jackson and Keys, 1984; Mingers and Brockelesby, 1997; Mingers and Gill, 1997; Midgley, 2000; Jackson, 2000, 2003amongst others). However, this research will focus on the perspectives of Jackson and Midgley, as these appear to be more suitable to this research context (as explained below) and are the most widely referenced in the extant literature.

According to Jackson (2003), pluralism involves the merger of different methodologies from different paradigms to solve complex problems in an intervention. He believes that a combination of methodologies can allow interveners to help facilitate the design of solutions to multifaceted social problems. He nevertheless advises interveners to consider the nature of the problem and its contexts when developing a methodological combination.

In contrast, Midgley (1989), in recognising the weaknesses of applying a single methodology in most interventions, encourages the intervener/s to draw *methods* from a variety of methodologies and develop a systemic approach, using his or her own methodological understanding (see, Midgley 2000; 2011; Midgley and Ochoa-Arias, 2004; Córdoba and Midgley, 2006). The basic difference between these authors is that Jackson says that the intervener/s adopts the given assumptions of the methodologies that he or she uses, while Midgley acknowledges that the intervener/s may have their own methodological perspective that actively reinterprets other people's methodological ideas. Thus, the agency and understanding of the intervener/s is critical to an

intervention: he or she is not a passive adopter of given methodologies, but an active interpreter and user of methods that are given methodological meaning through that interpretation.

Despite the above difference in their theoretical approach, it seems clear that both Jackson and Midgley agree on the fact that mixing ideas (methodologies and/or methods) from different traditions is useful because it enhances the flexibility and responsiveness of systems practice. While other similar approaches such as multi-methodology focus more on the combination of different methodologies in addressing complex projects (see, Mingers and Brocklesby, 1997), Midgley's approach allows the intervener/s to derive their own approach decomposing exiting methodologies, to source ideas, techniques to form an approach/es based on the context, instead of having a full combination that may not fit with the identified issues or the context. This suggests that such new approach can also enhance other operational models such as Lean, in addressing modern operational challenges that come with attendant complexities. Both authors also seem to agree on the importance of analysing the prevailing context in an intervention.

Nevertheless, these authors differ substantially in other regards. Midgley places more emphasis on the need for boundary critique (Midgley, 2000; Córdoba and Midgley, 2006; Midgley et al, 2007): the deep, contextual analyses of stakeholder perspectives, structural relationships and processes of marginalisation, which goes well beyond just the use of Ulrich's (1983) Critical Systems Heuristics. Jackson (2000) reserves boundary critique (in the form of Critical Systems Heuristics alone) for addressing 'simple coercive' contexts.

Jackson's point of view on pluralism and the exploration of context is termed "creative holism" (2003, pg275). He believes managers can become more successful if they approach complex problems by explicitly adopting the lenses of different sociological paradigms and using metaphors (e.g., machine, organism, team and prison) to understand the organisational context in multiple ways. He claims that metaphor analysis can lead to an appropriate diagnosis of the problem situation and enhance a responsive methodological design (see, Morgan, 1986; 1997 for earlier discussions of metaphors of organisation).

However, it seems that these metaphors offer merely descriptive analyses of problems but do not suggest solutions. They are arguably a means to getting an initial impression of which systems approach will be most effective (one that models interactions; clarifies and resolves disagreements; facilitates expansive, long term visioning; is focused on short-term detail; etc.). Boundary critique, especially when Ulrich's (1983) Critical Systems Heuristics is used, facilitates analysis of the context (what is the situation- what can be seen as wrong?) and ideas for solutions (what ought to be done – acceptable solution?) so could be more helpful than metaphor analysis.

Also, metaphorical analysis does not highlight who should be involved in or excluded from the discussion of the metaphors. In my view, this makes it unsuitable for my research process as metaphor analysis could only be useful with an overly narrow set of stakeholders who have an unrepresentative, homogenous perspective. In addition, metaphor analysis does not incorporate prior reflection on the issue(s) in focus: it tends to assumed that 'the organisation' is being looked at, yet complex problem situations may be multi-dimensional and multi-organisational. Similarly, the described issues could have a possibility of assuming different features that could alter the earlier

metaphorical description at some stage/s in an intervention. Hence, if a narrow management group pre-defines the problem or organisational focus and applies metaphor analysis to that, there is no guarantee that the results will capture a sufficient variety of understandings to lead to an appropriate methodological choice. Indeed, important information could actually be concealed.

While metaphor has attracted these criticisms, it could also be assumed that the application of metaphors could also have been undermined or misinterpreted among researchers, especially those critics of its application. And that would subject its use to further debate and development in Systems Thinking.

These problematic issues are explicitly dealt with in boundary critique by applying a participatory approach, identifying and involving the affected stakeholders which is therefore adopted in this research process. It provides a key focus on upfront exploration of whose/what views and issues should be accounted for in addressing operational issues under a given context (Midgley, 2000). However, this would be based on the condition of acceptance to participation and the willingness to contribute to discussion by the participants at each stage of the research process. It would also recognise the importance of giving confidential space to stakeholders who may not be able to talk openly due to power relationships.   It also encourages researcher reflection on a wide range of or other issues that may impede the research process (Midgley, 1997a; 2000).

Viewing these authors' perspectives (i.e. Jackson and Midgley), it appears that Jackson's creative holism (incorporating metaphoric analysis and other factors including the use of SOSM) and Midgley's systemic intervention (incorporating

boundary critique) are quite different. The submission in this research is that Midgley's systemic intervention is preferable to the former for this research because Jackson's version of methodological pluralism (creative holism) could be problematic in the Nigerian context, where factors beyond the organisational boundary can be very influential (see the discussion in Chapter 2). Although, Mambula (2002) advises that Nigerian business organisations need to operate in a collaborative environment that can enhance their mutual development, the implementation of this idea appears to be challenging due to cultural issues, positional egos, bureaucratic sentiment among practitioners, and systemic problems with the country's physical and social infrastructure. Similarly, the context of this research seemed to have visible challenge, involving participants who do not have a grounded knowledge of systems tools such as metaphor. These participants may find it difficult to apply metaphors effectively in the research process, compared to the use of boundary critique, which they tended to be conversant with in their daily operations.

Among the main issues affecting business-to-business relationships include language differences leading to misunderstandings; tribal affiliations producing social exclusion; prioritisation of customary relationships over legal contracts, resulting in contractual breeches; the need for defence against violence and criminality; and high levels of fraud and favouritism, especially in the Niger Delta where this research is based (Whitney, 1992; Ibeanu, 2000; Mambula, 2002; Abinu and Jagboro, 2002; Owolabi, 2007; Uche and Onuoha, 2010).

In line with the intention to explore these challenging issues and seek to suggest ways forward to address some of them (where possible), the adoption of a Lean and Systems approach, involving up-front boundary critique, will be most appropriate. It can

embrace the identification and involvement of concerned stakeholders in relation to the key issues in focus in the research process. This will involve developing a more detailed understanding of the Niger Delta context in which Lean and Systems are to be adapted. Unlike other pluralist approaches (e.g. Jackson, 2000; 2003), which tend to emphasise the selection of whole, off-the-shelf methodologies (Midgley, 1990, 2000). Ormerod, (2000) argues in particular that a tenacious implementation of a full methodology in a research process would not fit into the theoretical and practical expectations at all times due to   contextual factors that affect theory and practice in different ways. In this research, a   systemic intervention approach incorporating boundary critique will allow the combination of different methods and ideas drawn from several methodologies (both from Lean and Systems). The various issues and challenges that affect the different stakeholders would be identified via the use of these methods. This would entail designing the research process to involve different participants who may have varied background knowledge. They would participating in the identification of challenging issues,   sharing ideas and developing innovations with the intention to   embark on implementation that could bring beneficial changes, both to the organisation and the stakeholders(Moed, 2005).

3.3   Research Approach

3.3.1   An Action Research

Systemic intervention is undertaken in action research mode, involving the identified stakeholders in the intervention process. Indeed, most systems methodologies have been developed and applied in action research mode (Reason and Bradbury, 2001; Burns, 2007). Rapoport (1970) defines action research as a practical research approach that involves people collaboratively exploring an identified problematic situation within a

mutually agreed ethical framework, looking for solutions or ways forward. Walsh et al (2007) highlight the common characteristics of action research which include cooperative enquiry that embraces participation, allowing the participants to freely express their interests, define the focus of the research process, and create room for reflection and negotiations on the development of possible approaches to address identified issues (see, McKernan, 1991; Macniff; 1994).

Critics of action research (e.g. Karim, 2001; McKay and Marshall, 2001) note that the strong involvement of stakeholders who do not understand enough about scientific methodology can make its findings invalid and risky. Also, action research projects are usually based on just one case study, making the generalisation of their findings problematic. I will offer more on this topic later, when I discuss the specifics of my own approach. Several writers (e.g. Tsang, 2014; Walsh et al, 2007) have replied to such criticisms, explaining that action research offers a better understanding of the social phenomena at hand with *stronger credibility*, because the findings are meaningful to the stakeholders who have defined the research questions. It also embraces the participants' interests, while exploring a given research topic, rather than focusing on mere historical data that may lack current relevance to issues of concern to the participants (see, McNiff, 1998; Reason and Bradbury, 2001).

The above answers to the critics justify the choice of action research in this work, especially as one of my goals is to improve the use of Lean and Systems in a specific organisational context. It lends support to the intention to involve wider stakeholders in the research process, which could enhance the development of useful methods. It can also create a resilient foundation to addressing complexities in the research process when adapting and applying Lean and Systems tools, and it recognises the importance

of the context of the entire research process (see, Flyvbjerg, 2006; Midgley, 2000). In these respects, action research is in harmony with Midgley's (2000) systemic intervention approach. In a broader view, while action research would help trigger actions among participants in the research process, Systemic intervention would provide the various tools from both Lean and Systems at different stages of the research process.

Finally, Brydon-Miller (2003) reckons that, although action research allows for active participation in a research process, the researcher also has a pivotal role as a facilitator, without dictating the process of intervention due to the context of the research process, where the use of these tools seemed new, and having some of the participants as less literate. This is also a point that Midgley (1990) makes when he argues that the agency of the intervener is vital to the whole process, and should not be ignored in favour of methodology alone. This would give a good recognition to the context under which the intervention is done (see Midgley, 2000).

3.3.2   The design of research methodology

As has been discussed in this chapter, systemic intervention allows the combination of different methods drawn from different methodologies to address problems based on the methodological understanding of the intervener/s, usually in a negotiation process among stakeholders (Midgley, 2000). Systemic intervention fits well with this research process due to its focus on the practicality of findings, making it suitable for dealing with live phenomena in the Niger Delta business environment, rather than basing the research process on theories and methodologies that may not offer adequate consideration of context. Also, its underlying purpose of initiating change processes for the better fits with my personal values, as I am more interested in generating value for

my home community in Nigeria than in generating ideas for their own sake, and also striving to set a foundation for further development of Lean and Systems Thinking in the Nigerian context.

Taylor and Taylor (2009) predict a new wave of research approaches that adopt empirical methods, founded on both participation and observation. But they caution that the research objectives need to be developed in relation to context, and this should determine which methods to apply in a research process. They also encourage the researcher to digress significantly from traditional methods and adopt multiple approaches in exploring complex research topics.

In line with this argument, ideas and methods from Soft Systems Methodology (Checkland, 1981; Checkland and Scholes, 1990; Checkland and Poulter, 2006) and boundary critique (Midgley et al, 1998; Midgley, 2000) were applied in the field work process, together with Lean tools. These methods were used to view issues from different stakeholder perspectives. The purpose was to increase the understanding of different perspectives on the identified problems and potential solutions, so participants could take more informed actions in the longer term, based on the outcome of the intervention process compared with what they might have done without any intervention.

The use of boundary critique in this work was meant to allow each of the identified stakeholder groups the opportunity to freely express their opinions about what should be included in or excluded from the practice of Lean and Systems. It was also useful for me in reflecting on issues as they arose. Similarly, the application of mixed methods of data collection in the research was designed to support this approach, in order to

adequately source relevant data to inform both boundary decisions and decisions on effective ways forward.

3.3.3   Implementing case study approach and boundary critique

This research adopts a single case study approach, applying Lean and Systems tools in an operational process (and considering wider influences on this). It sourced relevant data from a case study firm; a commercial farm in the food production sector in the Niger Delta region of Nigeria. Many authors (e.g. Smith, 1975; Gerring, 2007; Gibbert et al, 2008), have offered criticisms on the use of single case study due to the fact that the generalization of findings could be problematic, lacking repeated confirmation in a given research process.

 However, Taylor and Taylor (2009) observe that case studies have been widely used by researchers, and they suggest that this approach can be more appropriate in certain research contexts due to the complexity and/or uniqueness of the research problems, and the impossibility of establishing a controlled or comparative study in the field. Denzin and Lincoln (2011) suggest that case study could enhance 'in-depth' details and richness of findings, which contrast statistical research approaches that mainly provides 'breath'- a wider coverage of cases, usually over long periods. They however explain further that case study and statistical research are complementary in most research processes, aiming to achieve results that best address identified research issues. They suggest the need for researchers to consider the nature of their research in choosing the appropriate research approach.

While Tsang (2014) tends to support the use of multiple cases in some research contexts, he/she is in agreement with other authors (e.g. Yin, 1994; 2004; 2009; Rendtorff, 2015). S/he notes that sometimes multiple cases are no better at enabling generalizability because in some cases, it could be impossible within the time frame and resource constraints of research to undertake enough case studies that can provide detailed evidence that could generate critical learning, due to issues such as uniqueness and context of research cases (see, Radnor, 2002; Silverman, 2013). Checkland (1981) talks about generating sufficient case studies across a lifetime of research to give confidence of the wide spread applicability of a systems methodology in different contexts, but clearly the time limits of a PhD prevent this: it is only possible for me to undertake one case study in this research. Nevertheless, if this case study is seen in relation to the wider literature, it may give more grounds for drawing justifiable conclusions than viewing it in isolation, via consolidated research process, seeking to explore the topic in the light of the set research questions.

The choice of a case study approach is common practice amongst Lean authors because most Lean projects come with unique features and specific cultural factors which tend to impair the possibility considering multiple cases in an intervention. Otherwise, it could result to having findings that cannot be uniformly applied to different cases due to contextual issues (see, Liker and Hoseus, 2008; Liker and Ogden, 2011; Papadopoulos et al., 2011; Tsang, 2014).

My adoption of a case study approach is designed to inform a consolidated focus by the researcher and the participants, with the hope of embarking on an in-depth intervention process aiming to identify and address problematic issues in the operational systems of

the case study organisation (for similar approaches, see Liker and Hoseus, 2008; Yamamoto and Bellgran, 2010; Liker and Convis, 2012).

According to Yin (2004), case study research methods seek to find in-depth answers to real life phenomena. Given that mine is exploratory research, the findings from my work can potentially form a good foundation for building new ideas that can be subject to further testing in the future (Rahim and Baksh,2003; Rendtorff, 2015).

Various primary data collection methods will be applied, which will involve sourcing data from both internal and external stakeholders. The data collection methods chosen for this research are discussed in the next section.

3.4   Data collection methods

This research work applied different data collection methods. These were applied on a complementary basis in line with the use of Lean and Systems tools.

3.4.1   Semi structured Personal interview

Qualitative, semi-structured interview questions were framed (see, appendix ii) in line with the general research objectives, research questions and the aim to set relevant boundaries to enable adequate participation by the identified stakeholders. Collis and Hussey (2009) define the individual interview as a method of primary data collection in which a sample of people are talked with on a one-to-one basis and asked questions to find out what they think about the subject being researched. Gillham (2000) observes that semi-structured interviews usually have enough of a structure to ensure key topics are covered, but not so much that it destroys the flexibility needed to engage with emergent issues in the interview process.

Each respondent was pre-informed about the interview schedule to give them reasonable time for preparation. The semi- structured interview was designed to serve as a flexible means of gathering in-depth information (Kitzinger, 1994; Gillham, 2005). The use of open questions was adopted to allow the interview respondents the opportunity to respond adequately. I also took the opportunity to probe further, when necessary (Wu and Wu, 1994; Gillham, 2005). Gillham (2000) argues that further probing offers the researcher the opportunity to ask supplementary questions for clarification, and it can sometimes reveal further issues not yet covered. S/he however notes further that the use of probes in an interview process are not predictable and mostly depend on the kind of initial response given by the interviewee.

Confidentiality of the interviewees and their perspectives were preserved. According to Collis and Hussey (2009); Harris and Brown (2010) confidentiality is vitally important if respondents are going to be honest in discussing issues, especially in situations where people who exhibit power relationships with one another, have different perspectives. Among the respondents were a key government agency, organisational managers, customers and input material suppliers, host community representatives, etc. (see table 3.1). Gubrium and Holstein (2002) define respondents as people who are willing and able to respond to the interviewer on a particular topic. Taylor and Taylor (2009) note that the contributions of affected stakeholders, and not just those involved in decision making, are relevant to achieving more comprehensive research findings than interviewing managers alone.

Table 3.1: Summary of Interview data collection in the research process

(Refer to chapter four for a clearer detail presentation on the use of interviews in the research process).

Main issue in focus	Total number of sessions	Respondents' status		No. of sess ions	Average time
		General Operational Issues			
Security	8	Top management	Assistant General Manager, General Manager, Admin Manager	3	45mins
		Security staff	-		
		CSO	-	2 3	
Religious Issue with staff permission to attend Sunday services	19	Top management	General manager	2	21Mins
		Middle managers	Hatchery, Layers, Brooding departments	4	
		Junior staff	Production section	13	
The	15	Middle managers	Production section	5	15Mins

challenge of inadequate power supply		Junior staff	Production section	10	
Aggressive leadership	19	Junior staff	Production section, Feed Mill, Sales and Marketing departments	15	25Mins
		Top management	Admin Manager, Senior staff	4	
Junior staff involvement in decision making	17	Top management	Assistant General Manager	1	18Mins
		Junior staff	Feed Mill, production section	13	
		Middle manager	Hatchery	1	
		Supervisor	Fishery	2	
Live-stock mortality	29	Top management	Assistant General Manager	1	20Mins

		Middle manager	Layers, Broiler departments		
				3	
		Supervisors	Brooding department		
		Junior staff	Production section		
				2	
				22	
Based on the implementation of Suggestions for improvement	27	Top management	The new General manager, the Assistant General manager, Other Senior staff	9	23Mins
		Middle managers	Production section, Sales and marketing department.		
		Supervisors	Fishery, Feed Mill	11	
		Host Community representatives			
		Junior Staff	Production section		

| | | | | 2
5 | |
|---|---|---|---|---|---|
| | | **Departmental Issues** | | | |
| Feed Mill | 14 | 1.Top Management | E.g. General manager, Admin Manager, General Accountant, Assistant General manager | 6 | 24Mins |
| | | 2.Middle managers | Managers from Feed Mill, Fishery, Layers, Piggery departments | | |
| | | 3 Supervisor at the Feed Mill | - | 4 | |
| | | 4.Input material suppliers | - | | |
| | | 5. Junior staff at the Feed Mill | - | 1
3
1 | |

Hatchery and Poultry	50	Top management	E.g. General Manager, Admin Manager, General Accountant, Assistant General Manager	13	21Mins
		Middle manager/s	From the Hatchery & Poultry Section		
		The Farm's Hygiene and Veterinary Consultant	-	11	
		Junior staff	From the Production Section		
		Host community representatives	-	6	
		Government Agency	-		
		Supervisors	From the production Section	8	
				5	

				5 2	
Marketing and Sales	15	Customers	Wholesale & retail buyers	6	18mins
		Middle manager	Marketing and Sales		
		Supervisor	Marketing and Sales	4	
		Junior staff	Sales attendants & Cashier	3 2	
Fishery	9	Middle managers	Fishery, Marketing and Sales departments	4	22Mins
		Supervisors	Fishery, Marketing and Sales departments		
		Veterinary Consultant	–	2	
		Top management	Assistant General Manager		
		Junior Staff	Sales Attendant & Cashier	1	

				1	
				1	

3.4.2 Participants Observational Method

Mckernan (1991) defines observation as a practice of doing research with other participants, with the researcher having two roles: participant and ethnographic observer. As a way to complement and enhance collected interview data, the use of observation was also adopted. While Ormerod (2008) highlights the relevance of participants' competence and experiences in the interpretation and conclusions of observed research data, I observed caution, though as a *participant* observer, not in the sense of becoming a worker in the company, but in the sense of interacting with stakeholders and consciously intervening. However, adequate care was taken to ensure that the intervention process was not influenced by the researcher, which could result in biases that could misrepresent the interest of the participants. My participation was as well justified by the context of this work which had some unique characteristics, such as the challenge of language, resulting in some participants needing an interpreter, the use of Systems tool such as rich pictures which required further facilitation at some points in the research process. Midgley (2000) argues that it is impossible not to intervene when undertaking research, and even the construction of a science experiment is an intervention to set up controlled conditions and produce findings that will change people's understandings of the research topic. In this research, my participation was limited to facilitating and offering clearer explanation on what was said in the research process (e.g. during workshop), but ensure the interest of the participants was not

interfered with. Lee and Broderick (2007) note that the observational method has gained more popular usage in qualitative data collection in recent times due to its ability to deliver data that may not be easily expressed quantitatively, or that is outside the awareness of participants. Argyris and Schon (1974) talk about the difference between espoused values of stakeholders and values-in-use: if only espoused values are attended to, then contradictory behaviour might be missed. My observations were also intended to address things like body language (ranging from head nods to facial expressions of interview respondents) in order not to lose vital information that may be relevant to the research purposes (see, Oppenheim, 1992; Gillham, 2000; Hiller and Diluzio, 2004). All observed data were recorded by the researcher using notes while the soft data, from interviews and workshops were recorded with a digital voice recorder.

The combination of interview and observation methods was applied as a means of overcoming unhelpful biases that could be associated with the use of just one of these methods of data collection (see Brewer and Hunter, 1989, for a discussion of the triangulation of methods). It also allows the researcher to have a continuous critical reflection on the context of the data collection process; to enhance an analytical use of collected data towards the achievement of the research objectives (Liamputtong and Ezzy, 2005).

Since the term 'observation' is often used in the context of social science research, observed events are subject to interpretation by the researcher/s, and indeed what is seen in the first place is influenced by the researcher's expectations, experiences and theoretical assumptions (Weimer, 1979; Midgley, 2000; Lee and Broderick, 2007).

3.4.3   Workshops

Watts and Ebbutt (1987) define a group workshop as a congregation of more than two interviewees participating in a discussion at the same time. Workshops give the researcher an opportunity to source information from more than one respondent simultaneously, which can be more efficient than structured interviews, although effectiveness in accessing viewpoints can be compromised if participants do not feel able to talk openly in front of others.

Bender and Ewbank (1994) observe that an advantage of workshops, is their usefulness in validating existing information. Also, they say that participants may stimulate each other in the discussion process, enhancing idea generation. Workshops can also be inclusive of those who may not be able to participate in other forms of qualitative data collection, such as the questionnaire method; this is particularly important when participants are illiterate or semi-literate (Langford and McDonagh, 2003). Of course some workshop methods involve writing on flip charts, but this is not essential: the researcher can simply record or take notes on dialogue. Barbour (2007) sees workshops as particularly useful for exploratory research when a relatively unstructured approach can allow for the emergence of unexpected topics of conversation. While focus group may adopt a streamlined focus on deliberating and developing solution to issues (see, Berg et al, 2004), workshops applies a more detailed approach aimed at discussing further details on issues identified, possibly identifying more issues via interactions and debate among participants, and jointly advance solution/s to address issues identified.

However, Arksey and Knight (1999) identify the possibility of conflict in workshops, leading prolonged argument among participants, which can disrupt the entire workshop

process. However, a good boundary critique prior to the choice of a workshop-based method can help the researcher anticipate conflict and avoid it by separating participants with opposing perspectives into separate groups. However, in this research, this was done with the consent of the participants at each stage of the research process (Midgley, 2000). Domineering attitude of some participants can prevent others from having opportunities to make their contributions. Similarly, Barbour (2007) notes that, unlike in other data collection methods, the responses from workshop participants may not flow sequentially because people in relatively unstructured discussions have the habit of jumping between loosely connected topics (refer to the next chapter for details).

In addition, Barbour (2007) points out that workshop dialogue may involve ambiguities that can be confusing for the researcher and the participants at the data analysis stage. I suggest that this is a particular problem when the researcher is unfamiliar with the issues that the participants are discussing, but ambiguities may be reduced through the researcher's immersion in the context over a period of time. So, the researcher assumed the status of a facilitator at some points in the research process and also an observer at other points in the intervention process, depending on the context and the consent of the participants (see the next chapter on report findings for details).

In my own case study, workshops to discuss data gathered from earlier confidential interviews was my preferred approach, with a view to participants learning from one another in the design of solutions to problems, but I reserved the option of replacing workshops with interviews in the event that boundary critique revealed that power relationships and/or prolonged arguments were likely to make dialogue unproductive. This was also due to shortage of time due to their busy work schedule, which could hinder possibility of having participants in a workshop.

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Bender and Ewbank (1994) observe that sometimes people become more willing to share their opinions on a topic if they are assured that no one among the audience will repeat them elsewhere. I resolved to establish this rule of confidentiality in my proposed workshops via verbal assurance and the use of consent forms (see, appendix i, iv), for literate participants. This was done by securing their consent to participate at each stage of the research process preserving the details of their suggestions and comment as promised in the consent forms, presented to them at the beginning of the field work process (see appendix i) . Bender and Ewbank (1994) also discuss the necessity for the researcher to identify differences in status between participants and cultural issues (e.g. language) that may influence the participants' contributions at the workshop. I was aware that it was normal for the workforce to speak *Pidgin English* (a formation of local dialect and the English language), and only a minority of managerial participants would be able to understand UK English, so I resolved to allow participants to use their own vernaculars. In addition, some workers (junior staff), and host community members spoke African languages, and I knew I had to engage the services of an interpreter to enable the success of a workshop where people spoke two different languages. I had to build in more time for dual language workshop sessions. See table 3.2 for details of the workshops undertaken.

Table 3.2: Summary of Workshop data collection in the research process

(Refer to chapter four for a clearer detail presentation on the use of workshops in the research process).

Main Issue in focus	Total No. of sessions	Workshop session	No.in attendance	Participants' status	Total number in attendance	Average time taken
General operational Issues						
Religious practice among Junior staff	1	1		3 Middle managers, 2 Senior staff from admin office, General Manager, General Accountant, 2 supervisors	9	120mins
Aggressive leadership	2	1	8	5 managers and 3 supervisors	13	68mins
		2	5	General Accountant, Admin Manager, Assistant General Manager, secretary to Admin Manager and a senior staff from		
Exclusion of junior staff from strategic decision	1	1	8	Admin Manager, General Manager, General Accountant, 2middle managers.3 supervisors and 1 Veterinary Consultant	8	90mins

making process						
Live-stock mortality	1			Assistant General Manager, General Manager, Admin Manager, secretary to Admin Manager, 2Middle managers from production section, 3supervisors and 1 Veterinary Consultant	9	150mins
Security	2	1	4	Admin Manager, Chief Security Officer, Assistant General Manager and 4 security staff	10	90mins
		2	6	Assistant General Manager, General Manager, General Accountant, and 3 senior security staff		
Departmental Issues						
Hatchery and Poultry	6	1	6	1 Veterinary Consultants, 3Middle managers, 2 Supervisors	36	78mins
		2	4	3 Middle managers, 1 Supervisor		
		3	9	5Middle managers, 2 Supervisors, Veterinary Consultant, The Assistant General manager		
		4	4	General Manager, General Accountant, Admin Manager and secretary to the General manager		
		5	7	3 Middle managers, 1 Veterinary		

			Consultant, 3 supervisors		
		6	6	4 Middle managers and 2 supervisors		
Fishery	3	1	8	5 Middle managers and 3 supervisors	23	60mins
		2	10	The Legal Adviser, General Manager, Assistant General Manager, General Accountant, Chief Security Officer,4Middle managers and 1 supervisor		
		3	3	Veterinary Consultant, 1Supervisor and 1 Junior staff		
Marketing and Sales	2	1	4	General Accountant, General Manager, Assistant General and the Sales and Marketing Manager	8	55mins
		2	3	General Accountant, Assistant General Manager and the Sales and Marketing Manager		
Feed Mill	4	1	17	Legal Adviser and 16 members of the host community representative committee	36	87mins
		2	4	General Manager, General Accountant, Admin Manager and Assistant General Manager		
		3	7	1 Veterinary Consultant and 6 middle managers		
		4	4	3 managers and 1 supervisor		
		5	5	1 manager, 1 supervisor and 3 junior staff		

3.4.4   Development of rich picture representation

The usage of rich pictures (large diagrams of problematic situations; Checkland and Poulter, 2006) was an auxiliary method to support the boundary critique. Information from confidential interviews and observations were combined into rich pictures for use in enhancing the data interpretation process, focused on the identification of systemic issues. I produced some rich pictures myself, following initial data collection, mainly interviews and present them during discussion with participants, or sometimes, an artist was consulted to make them simpler for use in the research process. This was because, some of the participants were not literate and sometimes, even the literate participants were not interested in drawing. In some instances during the intervention, the participants (i.e. those who could draw and were willing to do so), took part in drawing some rich pictures during discussion or at the end of workshop session. However, the use of rich pictures was sometimes refused by the participants because their time consciousness due to the nature of their jobs, and there was difficulty in having the participants do the drawing (see next chapter for more details). Loosemore (2010) reckons that the use of rich pictures is a useful departure from traditional methods of verbal communication, and the visual representation of the problematic situation enables participants to grasp perceived issues more quickly and easily than a lengthy narrative.

Midgley (2000) observes that Soft Systems Methodology (SSM)[9](rich picturing is one of its methods) encourages participants in an intervention to generate data through ongoing explorations of their perceptions, allowing them to participate in the design of

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[9]Checkland (1999) describes SSM as a systems methodology that has different methods that can both help to facilitate change and enable further learning.

their future relationships. Furthermore, the use of rich pictures prompts the researcher to ask more detailed questions on features surrounding the main issues in focus, enabling a wider systemic understanding to be developed. Stanton and McIlory (2012) observe that rich pictures help in expressing the multiplicity of relationships at play. I viewed rich pictures as a useful foundation for learning, as I saw it as unlikely that stakeholders would have immediate answers to deeply entrenched problems within and beyond the organisation: a process for developing ideas over time would be necessary.

Checkland (1981) says that, if a problematic situation cannot be stated clearly, methods such as rich picturing can become a means to express and explore ambiguities. Bell and Morse (2013) affirm that rich picturing, apart from its ability to enhance co-understanding, is also a relatively non-judgemental and non-threatening way to engage participants, as the emphasis is on depicting 'whole situations' rather than problems that can be blamed on particular stakeholders. This non-judgemental approach makes it more likely that stakeholder participation in finding solutions will be secured compared with methods that are perceived as blaming people for problems.

Authors (e.g. Williams, 1998; Horan, 2000) reckon that rich pictures can form an effective basis for stimulating questions and discussion among participants. Horan (2000) suggests that rich pictures have the ability to record views on the problematic situation with little reliance on text (useful to engage people with low levels of literacy). However, sometimes even clearly drawn rich pictures can lead to negative interpretations by some participants, which could either lead to conflict or misrepresentation in a research process, especially when the participant cannot clearly understand the importance of such rich pictures and be able to reflect it to the research context (Jackson, 2003). This challenge was avoided by the involvement of the

researcher and basing the use of rich pictures on the willingness of the participants at each of the research process.

Some authors (e.g. Bronte-Stewart, 1999; Venters et al, 2003; Stanton and Mcllory, 2012) advise users of visual methods of representation (such as rich pictures) to triangulate their approaches with other methods in their research in order to avoid ambiguities. In my case, I used both interview data and workshop discussions to refine my rich pictures.

3.4.5   Root definition and CATWOE identification

Checkland (1999) sees a 'root definition' as a description of a possible issue to be considered for further investigation in the SSM process. It forms a foundation that offers benefits to the entire SSM process (Bergvall-Kareborn et al, 2004), and is essentially a statement of a transformation that participants might want to pursue (plus elements surrounding this) that could improve the problem situation. The root definitions for this project were developed following the identified problematic issues, with the affected stakeholders at each stage of the field work, based on the set boundaries at each stage of the research process. It was also facilitated with the chosen data collection method at each stage of the intervention, including interviews, workshop or observation methods (see table 3.3).

While the relevance of stakeholders theories has been discussed earlier in chapter two-(section 2.7), the use of CATWOE, being a systems tools is applied in this research as a guide to ensuring prompt recognition and representation of the affected stakeholders in the research process. This led to the identification of the CATWOE elements of each root definition, needed to explore the various boundaries of the identified issues as well

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as the views of the actors and owners (stakeholders) about the proposed transformation process (see, table 3.3). "A root definition, being a description of purposeful human activity conceived as a transformation process, always embodies a particular worldview" (Checkland and Tsouvalis, 1997; pg158). Platt and Warwick (1995) note that, when the affected actors are not given an adequate opportunity to participate, there becomes the possibility of rejection of the results of the research findings. Basden and Wood-Harper (2006) say that participative management of the CATWOE process can facilitate better transformation of ideas, produced from a diversity of worldviews.

The CATWOE elements were defined based on the suggestion of SSM authors (Checkland, 1999; Bergvall-Kareborn et al, 2004;Checkland and Poulter, 2006; Basden and Wood-Harper, 2006), as follows.

C – Customers: those who benefited or victims affected by the identified issues in the research process.

A- Actors: These were participants in the research process who possessed the power or ability to effect or cause change that could lead to transformation of the identified issues in the operational systems considered in the intervention process.

T-Transformation: These were the developed change approaches (suggested solutions) aimed to improve on the identified issues in the research, based on the suggestions of the affected stakeholders (participants) in the research process.

W- Weltanschauung: These referred to the worldviews or perspectives of each identified issue/s, shared by the participants at different stages of the research process.

Owner- Ownership: These were stakeholders or participants who could stop or facilitate the transformation of the improvement process to identified issues in the research process.

E- Environment: These included wider environmental influencing factors that affected the research process which were duly considered in the intervention process.

CATWOEs were used to ensure that only the concerned stakeholders who would be involved in or affected by a possible transformation would be involved in the relevant part of the intervention process. The use of these elements was applied in describing the participating stakeholders based on the reflection on their shown interest in the identified issue/s at each stage of the research process.

Table 3.3: Summary use of CATWOE in the research process

(Refer to chapter four for a clearer detail presentation on the use of CATWOE in the research process).

Issue	Data Collection Method	Number of Participants	Participants' Status
1. Age of security personnel	Workshop	8	1.Top management 2. Security staff 3.Chief Security Officer
Age of security Personnel	Interviews	12	Middle managers
2. Exclusion of Junior staff from vital decision making process	Workshop	7	1.Top management. 2.Middle managers
Exclusion of junior staff from vital	Interviews	8	Junior staff

decision making process			
3. Live-stock mortality	Workshop	7	1.Middle managers 2.Top management
4. Aggressive leadership	Workshop	4	Middle managers, supervisors
Aggressive leadership	Interviews	3	Top management
Aggressive leadership	Workshop	8	Top management
5. Live-stock waste disposal	Interviews	4	Government agencies
Live-stock waste disposal	Workshop	5	
Feed Mill	Interviews	10	Customers

3.4.6   The development of process maps,

Based on the initial data gathered from participants at the research process, the use of
process maps were adopted. These would further express the flow of activities in each
department   which would help the participants recognise the value stream, the
connectivity of flow as well as trigger the recognition of the parts of the operational

process that would need improvements (e.g. waste identification and elimination), based on the suggestions advanced at each stage of the operational process. The process map of each department were presented, and at the end of each section a new process map depicting the new suggestions were presented.

3.4.7   Development of models for change

According to Checkland and Tsouvalis (1997), the purpose of developing conceptual models is to look at what it would take to accomplish what has been defined in a root definition. A conceptual model is essentially a 'human activity system' (Checkland, 1981): the minimum set of human activities needed to put a transformation into action, and each of the activities are logically connected by arrows indicating the order in which they have to happen. It therefore follows that all elements recognised in the CATWOE should be included in the conceptual models developed (Platt and Warwick, 1995). The main issues expressed in the root definition were deliberated upon with the affected stakeholders to develop potential models that could be put forward to address the problems identified. This covered the collaborative development of action plans with specified control measures and sought to enhance the awareness of all stakeholders on what was intended.

The agreed conceptual models of proposed Lean and Systems practice developed at this stage of the research process were compared with the rich pictures (drawn earlier) to ensure that all the issues identified were adequately addressed. Summary tables and drawn process maps are presented at the end of each section, based on the suggestions of participants.

3.5 Selecting an appropriate evaluation method

This section provides a review on the evaluation of the approach that was adopted, reviewing the various methods as part of this research. Evaluation involves identifying relevant values or standards that apply to what is being evaluated, using techniques from the social sciences, and then integrating conclusions with the standards into an overall evaluation or set of evaluations. The first step in the process, the identification of relevant standards and values to apply to what is being evaluated, has to do with what partners involved in the evaluation see as relevant in the particular case (Vestman and Conner, 2006).

This research applies consultation via the use of designed evaluation questionnaire or conversation with the less literate participants to gather relevant evaluation on the research process. This is based on the approach suggested by Midgley et al (2013) and other social scientists who share the notion that interventions and the methods used for them should be evaluated, in respect to how useful these methods were applied in the research process, highlighting what went wrong and what could have been done better either in method applied or the implementation of suggested output from an intervention (e.g. Checkland, 1985; Rouwette et al, 2009).

A number of different approaches to evaluation have been advanced in the literature. These include the use of a personally reflective approach that is based on the expertise of the researcher in evaluating the potency of a given method. However, the problem with a reflective approach is that other stakeholders may see an intervention very differently from the researcher who carried out the intervention, and this will not be visible unless those stakeholders are consulted (White, 2006; Midgley et al, 2013). Another popular approach to evaluation is a "universal" one, which seeks to generalise by assessing the same variables across multiple case studies of intervention (Rowe and

Frewer, 2004). While this is not adopted in this research, it has been subject to significant criticism too. Social scientists have expressed concern over the trivialisation of the unique aspects of the context of each intervention and the purposes of stakeholders (Eden, 1995; Eden and Ackermann, 1996), the universal approach ends up assessing only a small number of variables that are meaningful across contexts, and these are generally of little interest to stakeholders who want to see their purposes for supporting the intervention reflected in the evaluation criteria (and for further criticisms of a universal approach see Checkland and Scholes 1990; Romm, 1996; Entwistle et al,1999). The other thing to note, Rowe and Frewer (2004) admit this is a problem, noting that evaluating across multiple case studies of the same type of intervention usually takes years and can consume more resources than most researchers have available. This is a real constraint in the context of my PhD, and it made a universal approach impossible to adopt even if I had wanted to use one.

While Pawson and Tilly (1994) suggest relevant questions for accessing the viability of an evaluation approach, these mainly focus on the effect/s of suggested change and implementation of developed solution/s to the identified research issue /s of interest. Midgley et al (2013) recognise challenges in attempting to develop an approach to the evaluation of systemic methods in an intervention, due to influencing factors such as the skills of the researcher, the context, the possibly conflicting purposes being pursued by the researcher and the participants, and disagreements that may exist in the literature on the purposes of the methods applied. However, these kinds of challenges that can become foci for evaluation. Midgley et al (2013) summarise these challenges in a diagram (see figure 3.1), arguing that an evaluation should explore the use of *methods* in a particular *context* to meet certain *purposes* and achieve *outcomes*. These foci for

evaluation offered a platform for engaging those who were involved in the research process and allowed me to recognise the importance of the peculiarities of the research context that influenced my intervention process (see Eden, 1995; Rouwette et al, 2009).
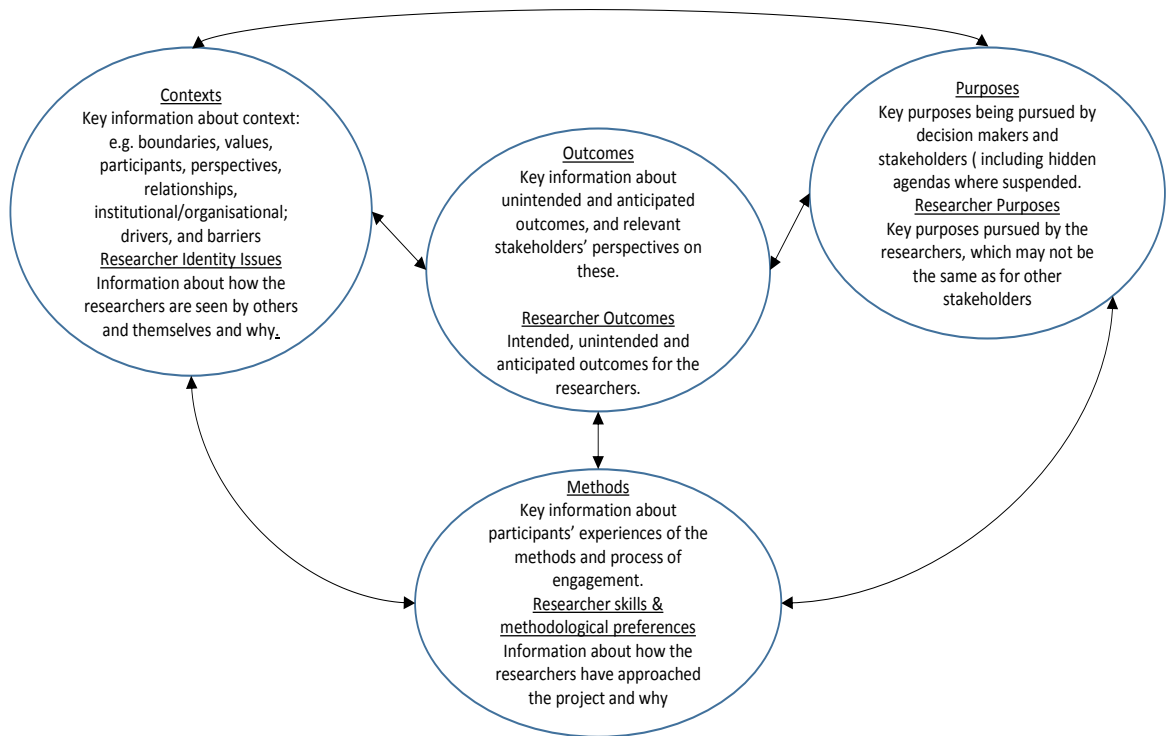
(Adapted from Midgley et al, 2013: pg146).

Figure 3.1: Conceptual framework for evaluation of Systemic problem structuring methods

An evaluation questionnaire was developed to evaluate the methodology and methods applied in this research. This was an adaptation of the one offered by Midgley et al (2013). The questions focused on finding what went wrong or well in the research process, seeking the participants' opinions on what improvement on the use and

combination of Lean and Systems might be needed for the future, especially in the context of Niger Delta region, Nigeria.

The drafted questionnaire was sent to my supervisors for advice on possible modification. The adapted version were applied without any further pilot testing because of the inconsistency of the context of this research, based in Nigeria, having less literate participants, which is different from what is obtainable in the United Kingdom for instance.

36 copies of the evaluation questionnaire were distributed among participants who participated in the research, and 28 (78%) were duly completed and returned to the researcher, expressing their opinions on what went well and what did not in the application of the various approaches in the research process. The respondents were drawn from different participants groups who could understand, and were willing to complete, the questionnaire. However, a round of discussion was held with a number of participants who could not complete the questionnaire to discuss the approaches applied in the research process, through the services of an interpreter (see, appendix vi and vii). Due to the keen involvement with the participants who witnessed and contributed to the research process, the data derived from the completed questionnaire feedback provided a source for further discussion in this thesis (see, chapter 5, 6 and 7).

3.6   Data Analysis

Qualitative data were recorded with the consent of the participants at each stage of the intervention process. Manual collation, transcription and analysis was adopted. An iterative process of sorting quotations into relevant themes was embarked upon, starting with initial coding into departmental and general operational issues (Miles and

Huberman, 1994) and then refining from there (Lacey and Luff, 2001).This was done with the participants who were drawn from among the identified stakeholders at each stage of the research process. These were identified as the research progressed, through engagement of the researcher with the concerned stakeholders in the research process. Quotations from the evaluation data (as opposed to the intervention data) were aligned with the research actions and the chosen methods from Lean and Systems used at different stages of the intervention (Dey, 2003). Again, the codes were refined as the analysis proceeded.

3.7 Ethical Issues

The research process was designed in compliance with the Hull University Business Schools' ethical code of practice. This required formal approval from the University and the case study organisation. A formal consent to participate in the research was obtained from the identified stakeholders at each stage of the research process (see, appendix i, iv, and v for these consent forms).While the full identity of the case study organisation was concealed for ethical reasons, the participants permitted the use of their positional identities (e.g. manager, junior staff), to present this findings of this research process.

3.8 Summary

This chapter outlined the methods applied in the research process, providing details of the methods of data collection and the various Lean and Systems tools applied. The chapter specified the intention to involve the affected stakeholders in the application of these tools. It also explained the evaluation approach applied in the research process, which was used to assess the various Lean and Systems tools and their effectiveness in the eyes of stakeholders.

The next chapter reports on the intervention process. It provides details about the stages

of the research field work process.

4 Chapter Four: Report on the process of Intervention on the Application of Lean and Systems tools: a Case in the Niger Delta Region of Nigeria

4.1 4.0 Introduction

This chapter presents a narrative of the intervention process. It reports the various comments and responses made by the participants at different stages of the intervention. The data collection took a period of nine months. The main focus was the operational process of the case study organisation and interactions with affected stakeholders. Systems tools (boundary critique, rich pictures, CATWOE), were used together with Lean tools (value stream mapping, waste identification events, rapid improvement events) in order to identify affected stakeholders and the issues to address in the intervention. All the workshops combined Lean and Systems tools, and the precise combinations were based on my analysis of the prevailing context, including the participants' expressed preferences. The data collection methods that were applied include semi-structured personal interviews, workshops and observation (as reported in more detail in the previous chapter). The data collected were from the different stakeholders who were affected by the operation of the case study organisation.

The collected data are presented in two broad forms which are; the general operational issues, covering identified issues that affect different sections and departments; and the departmental issues which border on the departments that function in their operational structure. The research process also offer due recognition of the involvement of the affected stakeholders in participating in the research process.

The structure of the chapter is thus as follows. First I will give the background of the case study firm, herein referred to as Organisation A. I will discuss the various areas of

its operations and the product lines covered. I will then look at the general operational issues that affect the entire organisation, and the operations of different departments in the various sections of the organisation, as revealed through my interviews and workshops. I also present relevant data about the challenging issues relating to each of the functional sections (departments), and more importantly, the suggested solutions based on the ideas sourced from the affected stakeholders via the data collection methods.

It is noteworthy to note that while these issues were categorised in these two broad forms (general and departmental), the level of importance attached to each of them was not specifically compared with other identified issues, but the research was focused on identifying and addressing each of these issues, via the use of Lean and Systems tools and the involvement of the concerned stakeholders at each stage of the research process. However, some of the issues were surfaced as the research intervention progressed but at each stage, the effective use of boundary tools was explored as a basis for the use of other tools in the research process.

Based on the issues and determining factors, such as the level of understanding of the participants, the issue identified and the overall context at each stage of the research process, the research assumed different roles, such as facilitator, intermediary, and researcher. The assumption of these roles were however guided by the research ethics and the use of tools such as boundary critique and CATWOE in the entire intervention process.

Finally, this chapter also covers the reactions and feedback from stakeholders following the implementation of some of the suggestions made in the process of data

collection, as well as adjustments made to improve outcomes in light of the company's practical experience.

4.2   A brief history of case study Organisation A

Organisation A is a live-stock farm in the Niger Delta region of Nigeria, Africa. It is an arm of a group of companies registered in Nigeria in the year 2000. The parent company has ventured into different industrial businesses such as marine security services, input material supply, oil and gas exploration, hotels and construction. The farm is located in a rural community in one of the Niger Delta states, in the southern region of Nigeria.

The establishment of the farm was informed by the diversification policy of the parent company and was a response to the Federal Government's call for individuals and corporate organizations to invest in the agricultural sector to address the challenge of food security, provide employment opportunities for many unemployed rural youth, boost this sector of the Nigerian economy, and stem the drift of the population to urban slum living.

Early on, the farm operated poultry, offering products such as broilers and table eggs to customers (later it would diversify into other live-stock products). It was employing people in the local catchment area, which was contributing to the economic development of the region.

The farm's operations in its first location, which it moved from, were faced with some challenges. These were due to the swampy nature of the ground, which could not accommodate the expansionary vision of the business due to the fact that only a small piece of the land was free from flooding, especially during the heavy rainy season in the

months of July and August annually. This created the problem of limited space for operations, which led the farm to acquire hundreds of hectares of land in a new location within the Niger Delta, where it is currently based. The move enabled it to continue to pursue its vision for continuous expansion, value development and a further contribution to the regional economy through modern, large scale farming.

According to the Assistant General Manager (AGM) of Organisation A in an initial interview: "The farm was relocated to its new site that has massive dry land where it has operated for over five years. It has current staff strength of over 115 ranging from the top management team, the middle management team, senior staff, junior staff etc. It has become one of the biggest privately owned farms in the whole of the South-South region of the country. The farm currently operates on a large scale, with annual turnover of over 120 million naira and a possibility of continuous increment due to the expansionary vision that is on-going".

Just like other big farms in the region, Organisation A has not been listed on the stock market, and neither does it share its ownership with any government agency. Its ownership structure is made up of a partnership between the company chairman, managing director and the executive director who also sit on the leadership board of the business.

 Among its key external stakeholders are the host community; which plays host to the organisation. They are mainly peasant farmers and traders make up a large percentage of the junior staff.. Also, the government agency takes charge of regulating their operations. For this intervention, the key government agency considered is the environmental health protection agency which acts on behalf of the government to

ensure conformity to set government operational standard requirements. Others are the input material suppliers, who supply major input materials (e.g. lime stone, maize, sawdust, charcoal), for live care. The organisation has a range of customers to the different products produced in the farm. These are grouped into the wholesale and retail customer, depending on the quantity of purchases they make.

The internal stakeholders are the top management, which runs the overall affairs of the farm the middle managers and supervisors that manage the different functions and the junior staff whose duties involve manning   the shop floor tasks in the farm.

All these are widely discussed in the continuing chapters of this thesis.

4.3   The organisational structure of Organisation A.

According to the respondents in my initial interviews, who were key staff and managers in the various departments, the farm operates a 'batch[10] operational systems' that rear live-stock on continuous basis, in high volumes and low variety in the different sections. Presented in Figure 4.1 is the operational process of the Organisation. The main sections operated by the firm were the Hatchery and Poultry production units, a Feed Mill[11], a Fishery, Piggery, Snailery[12] and a Cattle ranch. The farm has a strong expansionary mission, focused on meeting downstream market demands, which has led to continuous diversification of products from the original broilers and eggs. The Snailery, Piggery

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[10] Batch production is a technique used in manufacturing, in which the object in question is created stage by stage over a series of workstations. Products are treated together at each stage of the process (Slack et al, 2007).

[11] A Feed Mill is a plant or a compartment that sources input materials to process live-stock feed for rearing live-stock.

[12] The snailery is a pen where snails are reared and products produced from them.

and Cattle ranch were very new investments that were expected to take their first products to the market in the near future (see Figure4.1 below).

The majority of the junior staff were indigenous people from the local host communities, and this has boosted the commitment of the local tribes to the operations of the organisation. The government agency in charge of the regulation of the general operations of the organisation ensures that its operational process, which is regarded as critical to public health and safety, complies with set standards.

The senior staff structure of the organisation is made up of the top management and the middle managers. The top management includes the General Manager, the Assistant General Manager, the General Accountant, the Administrative Manager, and the Chief Security Officer. They have the responsibility of making operational policies and devise change initiatives as well as the authorisation to enact changes. Top management staff members are employed based on merit and the criteria set by the organisation for recruitment. The Assistant General Manager oversees daily operations, while the General Manager stands the position as the boss of the entire Organisation A and reports to the ownership board. According to these participants (Managers and key staff from the organisation), the middle managers are mainly professionals who specialise in different areas of operation. They are in charge of the different departments that function in the different sections of the farm. Each departmental manager leads the junior staff in that department (e.g. Poultry pen houses and other operational offices). They work out their daily operations to meet set goals and deliver reports to the top management.

Organisation A maintains different groups of customers for each of their product lines. These customers are mainly wholesale buyers who buy in bulk and sell to retail traders, with a minority of customers being retailers who sometimes buy lower quantities of their products. Other customers are competitor farms who buy products such as day old chicks and processed live-stock feed.

The organisation maintains a policy that emphasises the importance of service to the range of customers, and they aim to develop their operational processes in line with day-to-day customer demands. The current operational structure of the organisation is presented in Figure 4.1.

The Top management:

Oversees the overall operations of the organisation

| Live-stock production section | The administration and HRM office | The accounts & finance office | The security dept. | Transport maintenance & Logistics Dept. |

Poultry and hatchery

The feed mill

Delivers to customers

Sales and marketing department

| Layers Dept. | Brooding Dept | Cockerel Dept. | Pullet Dept | Abattoir Unit | Parent Stock | Broilers Dept. | Hatchery Dept | Piggery | Snailery | Fishery | Cattle ranch |

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Figure 4.1: The operational structure of Organisation A

4.4   General operational issues

4.4.1   Current operational value stream practice

From the interviews conducted with top management and middle managers in the live-stock production and Feed Mill, it was learnt that Organisation A practices a participatory management style across the middle management team, who work together on complimentary basis, providing support where necessary between the various departments operated in the organisation.

There are systems of reporting on operations in each department managed by appointed supervisors and the middle manager who works with the junior staff in making contributions towards the achievement of the core values of the organisation. These managers report directly to the top management.

 "Awareness of the operational value stream process helps to keep up their operational standards at all levels of their system" (manager at the Broilers).

 The value stream practice supports the operations of Organisation A in monitoring of activities at each section of the farm in the development of their live-stock products. Interviewees explained this, noting that every part of their operational process complements the other as they strive to achieve set standards and goals meant to satisfy the stakeholders of their operations. For example,

> "Keeping effective hygienic practice at the Parents-stock pen
>
> houses in the Poultry, guarantees the production of quality day
>
> old chicks at the hatchery. This connectivity is very important
>
> in modern farming" (manager, Layers department).

However, the respondents pointed out that the current value stream practice in the organisation is faced with challenges. They reckon that the issue of inadequate power supply has posed a real challenge to the operational process of the organisation. They also noted that the slow pace of communications and unnecessary top-down and also bottom-up communication bottlenecks, between the top management and the departmental managers. This sometimes led to ineffective value stream practices. They asked for better understanding and timely circulation of information that can trigger necessary actions at the right time to prevent production problems. Further details about the main operational challenges faced by Organisation A are presented in the next sections.

4.4.2 Challenge related to general security

From the interview conducted with the Assistant General Manager at the beginning of this fieldwork, it was learnt that the organisation currently operates a security department that has the responsibility of providing security services for people and properties on the farm. He later referred me to the Chief Security Officer (CSO) who oversees all security operations in the farm and delivers reports to the top management. Personal interviews were scheduled with the CSO and other security staff to deliberate further on the security activities in the organisation. However, this interview session was attended by a few staff in the department due to the refusal of the CSO to permit the rest of the staff the right of participation. He explained that the security department has full responsibility to provide security services to protect human lives and the assets of the organisation, noting that the rest of the staff on duty would not have time to attend the scheduled interviews.

On another occasion, a separate interview session conducted with the CSO and two other officers in the department. It was revealed that the security of lives and properties has remained a paramount issue all over the region (the Niger Delta) where the firm is located. This, according to these respondents, was due to the frequent occurrence of criminal activities, ranging from theft of products (e.g. eggs, birds) to the kidnapping of individuals (e.g. senior members of the organisation), and demanding of ransom payment for their release. The CSO noted that these challenges necessitate the operation of 24 hour security on the farm. It was learnt that the activities in the security department are reported directly to the top management by the CSO and assistant officers of the organisation. Unfortunately, my first session with the CSO was prematurely shut down due to a sudden emergency in the farm, but an agreement was reached to schedule another interview session.

In the next interview with the CSO, which lasted for about half an hour, he recounted that the security department works in alliance with the top management in their daily operations. Responding to the questions about the main challenges faced by the department, he explained that security tasks and challenges are not what the CSO alone can enumerate. Therefore, it was necessary for a more general meeting that could create room for better discussion and deliberation among the acting organisational members in the section of the organisation.

Subsequently, the consent for a workshop was granted, and the intention to apply Lean and Systems tools for deliberation. It was planned to involve managers from other sections of the farm too, so they could contribute their insights to the security question from their different perspectives. In this session, the aim was to jointly explore the current activities of the security operations in the farm and critically discuss challenges. It was meant to focus on the root causes of such challenges, identify their effects and

deliberate on possible means for improvement. Among those in attendance were the Administrative Manager, the Assistant General Manager, The CSO, and four more staff from the security department.

The majority of the participants claimed not to understand or had no prior knowledge of Lean practice, but all participants confirmed their readiness to offer their contributions to the discussion, as the agenda for the session was of high importance to their operational system. As a result of their expressed lack of knowledge, I commenced the meeting with a short briefing on the intention to apply Lean and Systems tools.

At different points during the discussion, the researcher had difficulty in maintaining the position of a facilitator due to requests from the participants for substantive contributions to the topic. While some writers in the literature (e.g. Checkland, 1981) argue that assuming the role of 'expert' can disempower participants and silence them, my observation was that this actually facilitated better understanding and encouraged contributions from the participants because my willingness to answer their questions as well as I could without evasion established a basis for trust. Since all the attendees at the workshop were literate (senior security officers and top management representatives), sheets of papers were distributed to participants to make a list of issues they thought affected the security department in the organisation. Personal testimonies were used to enhance the process of identifying the main issues in the security department and exploring their root causes, as this gives everyone the opportunity to contribute, thereby avoiding a situation where one person dominates the discussion. Also, ensuring the written contributions were anonymous protected individuals from any form of accusation if others disagreed with their ideas. The participants responded to this within minutes and the results helped to shape the discussion. This took a little time to summarise the written issues into categories, and ensure that the participants agree with

the captions of the different issues identified. However, the usage of vital Lean and Systems tools, such as process maps and rich pictures, were not allowed in the session due to time constraints. The main security issues and the subsequent suggestions for dealing with them in Organisation A are presented in table 4.1. Among the main issues listed and debated upon are the following:

4.4.3 The issue of public police patrols around the premises:

Participants commented on the current usage of the public police to patrol the premises and check on individuals and movements of products, meant to strengthen security (which the organisation makes some financial contributions towards, though such gestures are not formally recognised). They noted that the presence of the public police can lead to unnecessary threats to the staff. The Assistant General Manager, however, commented differently on this issue. He explained that the current use of the public police to patrol the premises was for additional security provision. He recounted an incident when robbers broke into the premises in the past and said that these kinds of problems cannot be adequately addressed by the firm's own security team alone.

4.4.4 Absence of women security personnel:

The workers also lamented the absence of women security personnel. They said that this has hindered checking on the honesty of women on the premises due to the cultural prohibition of men conducting intimate searches on women who are not their partners. They explained that this issue does not allow thorough searches or investigations of the female staff compared to their male counterparts. They suggested an immediate need to hire female security personnel for effective discharge of security services. Refer to

table 4.1 for a summary of the suggestion on the women's security issue in Organisation A.

4.4.5   The issue of low educational qualifications:

The participants (e.g. the CSO and the Assistant General Manager) pointed out that the current security personnel in the farm lacked the educational qualifications and the skills needed to match the security challenges in the organisation. The Administrative Manager explained that this issue was an error made by the pioneer General Manager (who resigned shortly after this research field work began), and those who were in charge of employment at the inception of the farm in its current location.

Other participants (e.g. Staff from the security department) cited the incidence of delays by security personnel in the process of checking and monitoring the movement of products in and out of the organisation's premises due to their inability to read or document security incidences effectively.

4.4.6   The issue of unfair work schedules:

Another issue raised in the workshop was the fact that work schedules in the security department were not fair due to the strict rota being run. Discussing this further, some staff members from the department lamented that their work schedules have made them become alienated as the current work rota operated at the security department is simply 'overloaded'.

> "We do not get any off duty days due to shortage of manpower
> in our department. We are made to work from Monday to

Sunday, which is not same for other departments" (security

guard).

A further issue raised in response to this challenge was the need for employing more qualified hands, as well as training the current security staff so they can provide more effective security services in the organisation. They noted that this was necessary to meet the challenge of criminalities in the environment where the business operates.

4.4.7 The Issue with the age of security personnel:

Participants at the workshop also raised the issue of the use of security personnel who were too old for the job. They noted that, although there is a need for security staff to have work experience before assuming duties with the organisation, they tended to have lost the physical abilities to match the demands of the security service. Some staff from the security department, who participated in the workshop, expressed their worries about some of these staff, especially those over 45 years of age whom they observed to be difficult to assign certain tasks to.

The Administrative Manager asked the participants to disregard the issue of staff age during the discussion as it was not relevant. Although other participants initially expressed their dissatisfaction with this assertion, they could not take the argument further due to the loud voice of authority and the positional influence the manager commanded during the session. No further suggestions or contributions were therefore made about the comment of the age of some security guards. He declared:

"We will not sack these aged staff but we would rather take a step further to ensure they are useful to our operations in whichever way we can" (Administrative Manager).

The session lasted for about two hours. While acknowledging the challenge of age, the CSO emphasised that the security department currently needed more personnel to match the daily security service demand in their operations, and the number of staff was more important than 'age'. He concluded with the suggestion of further deliberation with the top management.

Following this inconclusive discussion at the first workshop, participants agreed to schedule a second workshop session. This was necessary in creating an avenue to involve the more top management representatives who tended to possess the authorisation to make final decision/s about the issues at hands.

Being the owners of the entire system (according to the CATWOE), the top management had ultimate control of the operational process, so needed to participate in the second workshop. The participants were the Assistant General Manager, the General Manager, the General Accountant, three senior security officers (but not the CSO, who was absent on official duties) and the Administrative Manager. The objective was to deliberate further on the identified issues and gather relevant suggestions to address the issues that would enhance a more effective security operational system aimed at complementing the operational objectives of Organisation A, and meet the expectations of the identified stakeholders (the internal organisational staff, the downstream customers and the management).

The participants acknowledged the problems identified at the earlier workshop and explained further that these weaknesses in the security department adversely affected the general operations of the farm. They also corroborated the submission of the Assistant General Manager at the earlier workshop session about the usage of public police in the farm. They noted that the public police were only brought in at peak periods of higher sales volumes when more visitors (e.g. customers) came to the farm.

Furthermore, they explained that the use of public police would not stop the organisation from improving its own security, and the employment of new personnel and training of current officers were being actively considered. The session was brought to a close after an hour and a half when the top management were called away unexpectedly to meet some visitors.

These top management staff were unavailable for a third workshop on the same issue with security in the organisation, so a round of personal interview sessions was conducted with them. The General Manager pointed out that approval for a comprehensive plan to achieve their desired future for the security services, including further recruitment, had begun and would be vigorously pursued by management. This would involve the employment of some female personnel too, in order to address the need for proper security checks of both genders in the organisation.

As part of the new transformation, the Administrative Manager explained in an interview that the issue of academic qualifications was also being considered, as the issue had also been raised by participants in some other departments. However, he noted that a plan would be implemented through the subsequent recruitment of new staff, not by training current staff, as the latter would be too expensive and time consuming. Commenting in the same interview section, on the issue of academic qualifications, the Assistant General Manager explained that the plan was to hire people with a minimum of an 'ordinary level' certificate, which should mean that they will be able to read and write sufficiently well to do the job effectively.

Finally the Assistant General Manager noted that the plan for the employment of a new batch of staff in the various departments, especially in security, would also address the identified issue of unfair, continuous work schedules. He assured employees that the new plan would see security staff having two days off work in a week. He however

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recounted that, from the perspective of the top management, the security department could not be operated like other sections such as the Sales and Marketing department, where Sunday is a standard off-work day for all staff, because security is a continuous need.

Table 4.1: A summary presentation of identified issues and suggestions for improvement on current security operations in Organisation A.

Identified Issue	Suggestions for transformation.
1.Low educational qualifications of current security staff	• Review current employment requirements to include a minimum academic qualification of ordinary level.
2.The issue with age of some current security staff	• Offer more training to current security force and equip them for better performance on the job
3.Issue with the frequent usage of public police patrols	• Top management to only use public patrols when the in-house security guards cannot cope, and more in-house security guards to be recruited.
4.The issue with unfair work schedules	• Review of current work rota for a fairer time table that includes off days for staff in the security department

4.4.8   The issue of inadequate power supply in Organisation A

Various managers and supervisors in the main operational sections of the farm, and other top management staff, responded to the initial interviews. They lamented the state of the inadequate power supply faced by the farm in its operational system, acknowledging the problem as a common issue in the Niger Delta region where the farm is located. This could be attributed to the poor supply of power by the PHCN (the government agency that generates electricity) to users.

These respondents explained further, citing the amount of waste of processed poultry products in the cold rooms (decay of frozen live-stock products) due to the power supply problems, which often resulted in the refrigeration units warming to the point where the products became contaminated with multiplying bacteria.

Although the purchase of an alternative, local generator had been approved by the top management and had been installed, the costs of this were significant. The General Accountant explained this further, noting that the usage of an alternative power generating plant requires lots of insulation because of noise pollution for the live-stock, especially egg-laying chickens that were less productive when stressed by the sound of the generator.

A further waste related to the high fuel consumption of about 500 litres of diesel a day (15,000 litres per month). Even with the combined output of the intermittent public power supply and the generator, the company was still not able to adequately power all its various operations at once. Hence, they rotated its main operational activities that required a power supply (e.g. live-stock feed milling and freezing poultry products) (see table 4.2). This practice, according to the participants, prevented them from fulfilling orders in a timely manner, such as milling for both the farm's own live-stock and

external customers. These respondents emphasised the need to continue to devise new means to manage the situation (see Table 4.2 for a summary presentation on the inadequate power supply and the challenging effects of it).

Most of the participants, especially the managers, supported the request to embark on further deliberation on this issue, but the general view was that there wouldn't be any permanent solution to this challenge, because the power supply challenge affects businesses all over the region where the farm operates, and rotation was the best solution that anyone had come up with. The effects of inadequate power supply on the different departments of Organisation A, based on respondents' comments, is presented in table 4.2 below:

Table 4.2: Effects of the challenge of inadequate power supply.

Department	Challenging effects
1.Abattoir	• Poor storage of processed live-stock products posing the danger of decay and losses. • Inability to operate the machines for processing live-stock products.
2.Feed mill	• Challenge of inability to mill for the farm and external customers.
The entire live-stock production section	• Inability to effectively pump water and provide adequate power supply.

Due to the busy schedule of work activities run in Organisation A at this period of the data collection process, the researcher restricted the data collection method to personal interviews alone whilst awaiting the right time for the possibility of applying other data collection methods (e.g. workshops) when the concerned organisation members would have the time to participate.

At this point, also, an observation was made by the researcher that some junior staff were doing different jobs than usual in different locations on the farm, and they kept muttering about this and saying it was an unpalatable experience. With approval from the top management, I interviewed a selection of junior staff from different sections of the farm on individual basis. The next section presents details of the challenges of multitasking faced by these staff.

4.4.9   The challenge of junior staff multitasking

From personal interviews conducted with the above junior staff and later their supervisors, it was learnt that the movement of staff around different departments within the organisation concerned mainly staff from the Hatchery and Poultry section, the Abattoir and Sales and Marketing departments (see table 4.3 below).

The junior staff were unhappy with being moved around because they felt over used and unduly exploited by their managers. These respondents claimed that this issue had led to staff shortages in some departments in the organisation (e.g. the Abattoir, Fishery and some of the departments in the Hatchery and Poultry section) where staff had left and there were even shortages of basic facilities such as disinfectant liquids. The workers claimed that being moved from department to department with little notice was

stressful, and this was exacerbated by the regular malfunctioning of the freezing system due to the power problems.

This issue, according to the junior staff respondents, has posed a threat to staff wanting specialisation or interested in specific jobs in the farm. They pointed to the middle managers and the top management as the main parties involved with this practice in the organisation.

The main effects of the issue of junior staff multitasking are presented in table 4.3 below:

Table 4.3: The main effects of junior staff multi-tasking on the general operations of the Organisation A.

Affected departments	Effects
Abattoir, Poultry, Fishery, Feed Mill and Fishery	Shortage of skilled staff to complete operational tasks.
Feed Mill, Poultry and Hatchery, and Fishery	Wastage of operational resources (live-stock feeds, Pen house Flooring materials).
All the affected departments	Loss of special skills.
All the affected departments	Loss of interest; poor task accomplishment.
All the affected departments	Depleted focus and morale Lack of understanding of some basic task due to poor orientation from the superior staff

Due to the importance attached to this issue by these junior staff in their interview responses, further interviews were scheduled with some middle managers in the affected sections of the farm. I specifically talked with those who were responsible for moving others around the different departments concerned.

One of the middle managers in the Brooding department commented that the junior staff members have no right to question their posting, and the management has every right to post any staff to any department.

The manager in charge of the Layers department explained that the staff movements could partly be attributed to a general shortage of manpower, and this has come about

due to the expansionary program running in the various operations. He stated that they, on their own as middle managers, do not have the authority to employ new staff, and that the top management should give due approval to employ more staff to match the expansionary program that the farm is currently engaged in.

> "We move staff to the Feed mill to help address man power shortages in milling our live-stock feed during peak periods. The ordinary practice would require that, as population of live-stock is increasing, manpower is supposed to increase as well, to match the responsibilities, but this is not the case at the moment. The Feed mill, for instance, is simply under staffed!"
>
> (Manager, Layers department).

Further personal interviews were arranged with top management to source further explanations of the issue of junior staff multitasking. These involved the Assistant General Manager and the Administrative Manager who had operational interactions with the junior staff (and were considered by the latter to be the owners of the issue, in the sense of ownership described by Checkland, 1981). In his reaction to this issue of multitasking, the Administrative Manager acknowledged the need for more manpower in the junior staff category. However, he explained that the organisation was not prioritising new recruitments in order to focus more on staff development with current employees, especially focused on tackling illiteracy, absenteeism with the current manpower.

> The Assistant General Manager spoke differently on the issue of junior staff multitasking, noting that making more of an effort would make these workers more useful, especially in the face of challenges of new task accomplishment as a result of

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the expansionary vision of the organisation. He suggested that this issue could best be addressed via seminars and lectures, which he claimed would improve their understanding and zeal for the job. Currently, junior staff are employed and hand over to the middle manager who shows them the job tasks in the various department where they are posted. The main contention is that the junior staff expects organised transfer while the management adopts unscheduled posting which the staff are not happy with.

Explaining this further in a separate interview, the General Manager explained that the idea of moving junior staff from place to place was originally introduced deliberately to develop staff skills on the job in different areas of operation, which he referred to as "multi-skilling" rather than multitasking. The Administrative Manager, who was in charge of staff postings, also confirmed this and said the practice is not just confined to junior staff alone:

> "We are even moving the middle managers around different departments to enhance their technical abilities on the job and prepare them for the future, except some staff do not want to grow and they can complain!" (Administrative manager).

In a follow up interview with some of the junior staff involved with this issue, it was revealed that the intention of multi-skilling had not been thoroughly explained to them by their managers, which according to them had resulted in them being moved around without knowing why, leading to the complaints expressed (see table 4.3 above).

4.4.10 Challenges related to the exclusion of junior staff from vital decision making processes

From further interviews with some junior staff about their perceptions and involvement with the operational process in the organisation, some of the respondents stated that the firm's information and communication with the junior staff is mainly channelled in a conventional way through the middle managers in each department to the top management.

These junior staff cited some occasions when their interests were either misrepresented to top management or they were marginalised in the operational decision making process. They claimed that they were viewed as inferior in the decision making process, even though they knew a lot about front line production issues, and this instilled a mentality of inferiority within them. A junior staff member added the following on the condition of strict anonymity, for fear of being disciplined:

> "You report one thing to your manager, he either fails to present it to the top management or sometimes even forgets completely! You know we are not allowed to meet any of the top management staff directly! In a fair practice, the management is supposed to provide an opportunity for the junior staff to express their interest" (junior staff).

In order to get further details on these issues, and possibly identify actors (those involved) who could take action on the challenge, an interview was booked with the Hatchery manager. He explained that he could not see anything wrong with their current management decision making system. However, he noted that the top management are in position to authorise the involvement of junior staff in the decision making process if

they want to. He suggested that the right step to take is for the researcher to meet with the top management for further deliberations.

The explanation of the Hatchery manager prompted a meeting between the researcher and the Assistant General Manager in another interview, to ask for his opinions about the issue and the possibility of meeting the top management for a discussion on the topic. He suggested the need to discuss it further in a workshop where all the top management staff available can comment. While also suggesting the inclusion of middle managers who may be available, he cautioned that the session must not be held for too long as all their staff had busy schedules of activities during the period.

Having been assured of their readiness to participate by the Assistant General Manager, others were contacted and a workshop date was scheduled. The boundary of participation included all the middle managers in the entire organisation, the supervisors and the Veterinary Consultants, and all top management staff available. Although the junior staff were aware of the meeting, I did not invite the junior workers, as I did not want to put them in a position where they could be discriminated against if they spoke openly about the issue and the management was unwilling to change.

The session was caption: the way forward to effective decision making process. The aim was to deliberate on the issue of the marginalization of junior staff in the decision making process, which the participants consented to. The researcher explained the intention was to apply systems tools in addition to process maps, following Lean and Systems principles. They showed understanding of the reason why participation was opened to the top and the middle management staff. It was further explained to them that this was due to their position in many of the CATWOEs as owners of the entire system of operations, having the authorisation to grant approval for changes and

improvement plans (whether at the top management levels in the case of policy changes, or the middle management covering daily operations).

The top management staff in attendance were the Administrative Manager, the General Manager and the General Accountant. The Assistant General Manager promised to join later in the session due to a busy work schedule. Among the middle management staff present were those from the Layers and Piggery departments and the supervisors from the Abattoir and the Pullet departments.

At the start of the session, the researcher, who assumed the role of a facilitator, briefed the participants about all the various issues identified by the earlier interview respondents, ranging from the challenge concerning the marginalization of junior staff in the management decision making process, the issue of the inadequate power supply, religious issues and the issue with junior staff multitasking. Although the participants did not have a set yard stick to measure the importance of these issues, religious issues in particular were treated with utmost importance as they concerned a significant number of their work force, especially the junior staff.

The workshop lasted for about an hour and half. The participants (not the researcher), commenced discussion with the suggestion of the Administrative manager, on the possibility of granting approval for junior staff to have delegated representation at their general management meetings, to offer them an opportunity to represent their interests in the decision making process. This was met with strong opposition from some participants (e.g. the General Accountant, the Hatchery manager, and supervisor at the Abattoir). Those objecting to this proposal said the current junior staff were mainly semi-literate and, as such, would not be able to make meaningful contributions to discussions during general meetings where important issues about the running of the

organisation were discussed. They said it might be possible in future when new, literate people had been recruited. Later in the workshop people began to accept the idea of junior staff representation, but found it difficult to reach a concerted decision, and therefore decided to hold off until the Assistant General Manager was present, since he was absent from this workshop. The General Manager has an influential role on the passage of a decision on the matter about the involvement of junior staff in top management meetings.

The participants unanimously objected to the possibility of junior staff having any other means to communicate with top management, other than representation at meetings, though they all acknowledged the possibility of poor top-down communication, if instructions had to be passed through middle management, or misrepresentation of the views of individual junior staff by some officers. They concluded the session with the explanation that the General Manager or the Assistant General Manager makes a tour round the various departments at regular intervals and therefore can be reached if there are any real emergencies.

Later feedback showed that approval for representation was subsequently granted after the Assistant General Manager met with the rest of the members of the top management team. This meant that some junior staff came to have the opportunity to participate in management board meetings when issues relevant to their operational duties were debated at the farm board meetings. The new development was made known to all the junior staff through the departmental managers and supervisors. This was meant to take immediate effect.

Following the workshop on the junior staff interest in the management decision making process, the junior staff members (who were the customer-beneficiaries according to

CATWOE) were interviewed. This was just to ascertain the impacts of the new decisions taken by the top management on the affected parts of the operational process of the case study firm. Their responses showed that this effort was much appreciated by the junior staff, and they now have their nominated representatives at the general meeting with the top management. Some expressed the feelings that their morale on the job as well as interest in the organisational operations has been boosted, which they said has encouraged further commitment to the organisational goals by all the affected junior staff.

"They have become a 'listening top management'! We only hope this gesture continues and also extends to reach other vital areas of our relationship with the management" (a junior staff member at the cattle ranch).

Table 4.4: A summary of the main operational issues with the exclusion of junior staff from the decision making processes.

Main issue	Suggested approach for transformation
Neglect of junior staff interest in the decision making process	Approval for junior staff representation at general meetings

4.4.11 Challenge relating to Religion

Further personal interviews were conducted with some junior staff to explore their perceptions of the general operational process of the organisation.   As part of their responses to the interviews, some of these respondents who were chosen at random, expressed a general grudge nursed by the majority of junior staff across the entire organisation on the issue of the neglect of their religious beliefs and practices by the management when it came to operational schedules (see table 4.5 for a summary of affected departments). They complained that management does not allow them to attend church services on Sundays due to tight work schedules. Others complained of management refusal to allow them participate in cultural festive activities due to job demands. The few Muslim staff in the organisation are a minority- about two management staff and some junior staff. They are permitted by management to attend the mosque on Fridays and sometimes prayers during working days within the organisational premises, while the other very few staff who neither go to church nor mosque never really complain. They noted that these experiences had had adverse effects on their individual lives as well as their job performance. "We feel really bad about our inability to get to church" (junior staff at the cattle ranch).

Following identification of this issue, an appointment for an interview was scheduled with the General Manager to ask for further deliberation, as the Assistant General Manager, who takes charge of general daily operations, was not available. He suggested the need for further discussion on this, saying it is likely that there would be divided opinions on the issue, so it would have to be talked through.

Hence, a two hour workshop was agreed with the top management. Among those present were the Veterinary Consultant, the General Manager, the General Accountant, and other senior staff at the administrative office. Others were the managers at the Layers, Brooding and Piggery departments, plus a supervisor from the fishery section. These participants were mainly owners, in the sense that they had the authority to decide on the topic discussed. They could also be seen as customers, as the effects of whatever decision was taken could affect their operational performances either at the departmental or corporate levels.

During discussion, a brief introduction was made by the researcher to the request by junior staff to attend Sunday church services. A middle manager from the Piggery affirmed that this religious issue is not relevant to their operations since all junior staff are entitled to off duty days every week. He thus suggested the session should be terminated. However, majority of the participants objected to this, and a rowdy argument broke out. One manager then intervened to say that, for the sake of the progress of the entire firm, every issue raised should be duly considered. This response calmed down the participants, and the manager objecting to the discussion accepted it.

Continuing with the discussion of the issue of Sunday church services, some of the participants (e.g. the Veterinary Consultant present), acknowledged that there was indeed an impact on their operations, and that he had heard some junior staff

conspicuously expressing their displeasure at the disapproval by the management to attend Church services on Sundays. He said it was certainly affecting morale.

The Hatchery manager then suggested a solution: a practice known as 'skip a day' in live-stock farming, which he explained to mean allowing the animals to go without food for up to 24 hours in an emergency. Other participants at the session went on to explain that, by using this practice, the top management would be able to offer the junior staff approval to attend church services on Sundays. One of the participants then explained that skip a day is not new to the top management. He referred to some managers who were absent as part of a team of managers who had suggested the skip a day model to top management in the recent past, and nothing was done about implementing the idea. They speculated that the issue was doubted as to the possible effects on the live-stock.

In sharp reaction to this explanation, an argument ensued between some of the top management staff and the middle managers, with the former accusing the latter of implying that the top management were negligent. The General Manager intervened, saying that the point of the session was not to trade blame but to find solutions to the challenge at hand. He therefore encouraged participants to re-engage in peaceful discussion because of the importance of the issue to their operational process. All the other participants strongly supported this, which reinstated calmness, but further discussion on the issue did not continue. My attempts to get people thinking about other possible solutions were met with silence.

The workshop came to a close with a suggestion from the supervisor at the fishery to advise the top management to review the suggestion of the skip a day model once again (see, table 4.5 for the final decision made by management, which actually managed to create a win-win for the junior staff and the animals).

After the inconclusive ending of the workshop on the request by junior staff for leave to attend Sunday church services, some middle managers were contacted for further interviews (e.g. those from the Hatchery and the Layers departments). They all declined, expressing their unwillingness to comment further on the topic, which they noted was a critical one that could only be addressed by the top management. However, they advised me to meet with the top management (either the General of Assistant General Manager) to gather further information about their opinions on the issue.

In an interview, the General Manager told me that the top management had agreed to grant approval for the junior staff to attend church services, with the hope that this would encourage commitment to the organisation and help address the issue of junior staff turnover, which he noted was challenging to their operational system. He explain that a trend had emerged in their operations whereby they witness a number of junior staff resigning their appointments, especially at the beginning of the year when after receiving their end of year bonuses at the end of the preceding year. He explained further that their decision to let these junior staff attend church was in recognition of the religious beliefs. However, he also noted that the management had refused to let these staff go off work completely on Sundays, but asked that they resume work in the afternoons after their services so they could feed the animals (see table 4.5 below). He also stated that the plan for the future was to have a structure in place that allowed the junior staff whose beliefs do not require Sunday worship (e.g. the Muslims), to stand in on Sunday mornings for others, while observing their own, different off days for worship.

Table 4.5: Summary of the decision on how to address the issue of religion

Affected department	Decision for transformation
Mainly production section (e.g. Layers, Broilers, Piggery, Snailery, Fishery Parents stock, Pullet and other departments where Live-stock are kept.	• Allowing junior staff to attend church services on Sundays mornings but resume work in the afternoons. • A plan to consider the same for other junior staff with different beliefs.

4.4.12 The issue of live-stock mortality

Among the main production issues highlighted by the respondents (mainly the junior staff) was the issue of mortality of live-stock in the farm, especially in the Poultry section (see table 4.6 for the affected departments). Although this issue has been known to the top management, whom they explained has done quite a lot to address the concerns of the junior staff, respondents explained that live-stock mortality is a major obstacle to meeting downstream customers' expectations. They suggested that this challenge requires further attention from the management.

The claims of these junior staff were taken to some middle managers for further comment (e.g. Brooding, Layers, and Broilers departments). While they acknowledged the problem, they explained that the causes of mortality are complicated, and said that it would require continuous effort to address them. They also suggested the need for me to contact the top management to inform them, that mortality is a company-wide challenge to their operations. This could be due to the fact that the top management makes most of the organisational decisions, which the middle managers implement.

This suggestion from these middle managers prompted a meeting of the researcher with the Assistant General Manager, who later granted the permission for a workshop on the issue of mortality. Among the invited participants were the top management (the owners, based on CATWOE). They in turn suggested the inclusion of the middle managers and supervisors from each of the concerned departments (i.e. the Parents stock, the Poultry section, and the Veterinary Consultants). Those departments are key players ('actors', based on CATWOE), in the operations of Organisation A.

Among those who honoured the invitation to participate were the middle managers from the production section (Layers, Broilers and Brooding departments). Others included the supervisors at Abattoir, Parent stock, and Pullet departments). The top management present were the Assistant General Manager, The Administrative Manager, the Secretary to the General Manager and the Veterinary Consultant.

At the session, which lasted two and a half hours, participants were given the opportunity to air their views about the situation and deliberate on better ways to address the challenge. A collaborative usage of rich pictures was adopted. It prompted participants to make contributions, pointing to the rich pictures, though it slowed the session a bit, the participants drew and commented on the rich pictures pasted on the wall (see, figure 4.2 below for the rich pictures used in this session). This was followed by further deliberation on the issue of mortality. They pointed out that the organisation has a live-stock mortality allowance of 5% (i.e. the acceptable level of mortality in the farm, beyond which, it becomes a concern to the organisation, and below which it would not be held as a challenge to the organisation). They attested to the fact that the farm had recently experienced higher rates of mortality in all the various departments where they keep live-stock. The participants affirmed that this issue had occurred repeatedly in the past, despite their efforts to address the situation through laboratory

analysis of disease samples and the administration of medication. This issue had adversely affected productivity in terms of meeting stakeholders' requirements, especially the downstream customers who patronised the Broilers and Layers sections of the farm. The top management explained that trying to address the mortality issues had consumed a large amount of resources, ranging from series of laboratory tests, investment in different structural adjustment of Poultry, and changing the live-stock pen preparatory materials, yet they persisted.

The middle managers (e.g. Broilers and Layers departments) noted that the persistent mortality problems could be due to the use of external live-stock feed, which they claimed could not be trusted to meet the nutritional needs of the live-stock. Also, they said that mortality occurs due to uncontrollable changes in the weather conditions and neglect of daily operational routine practices, such as the use of disinfectant foot dip at the pens by all staff and visitors. The latter is used to prevent the quick spread of diseases to live-stock, especially chicks at the brooding stage that are said to have low resistance to epidemic outbreaks.

Some participants (e.g. supervisor at the Parent stock department and the middle managers at the Layers and Broilers departments) suggested that, when a mortality incident occurs, the Veterinary Consultants should seek some on the spot explanations from the junior staff on duty concerning when and how it came about. This suggestion was responded to with a counter argument from the Veterinary Consultants who said they were not interested in sourcing any information from junior staff (pen attendants). They explained that most of the junior staff working at the affected pen houses are not literate and informed enough to be able to explain mortality. For instance, some of these junior staff cannot document events if there is no senior staff on ground. Therefore training them is also challenging as it was possible for them to learn   on the job

coaching and experiences while taking instructions from their superior staff. This makes the possibility of conducting a formal learning section difficult and also presents a challenge to other on the job learning approaches, due to issue such as, differences in language. Instead, the consultants suggested the need for enhancement to the farm laboratory, so they could have better equipment to conduct post mortem analyses. They claimed that this would make diagnoses more reliable, and should be implemented in addition to precautionary practices (e.g. improved hygiene) to prevent live-stock mortality.

Discussing this issue of mortality further, the Assistant General Manager commented that, in addition to the continuous fight against mortality on the farm, a plan to internally develop some critical input materials (e.g. concentrate for live-stock feed) had been approved (see table 4.6). He explained further, saying this would help to address mortality issues on the farm to the extent that they can gain absolute control over the processing of feed for the live-stock.

To solve these issues, the top management participants agreed to review the current employment policies of the organisation to pay special attention to raising the current academic qualification standards for the employment of junior staff (e.g. pen house attendants), which had become necessary anyway for better performance on the job. The used the rich pictures to analyse the situation further, noting that the pen attendants' performance could also be linked to the mortality challenge in the organisation. They also identified the need for an additional staff member in the Veterinary and Hygiene department who could assist the efforts of the consultants in the fight against live-stock mortality (see table 4.6). These suggestions were also agreed by the middle management, who pledged their support.
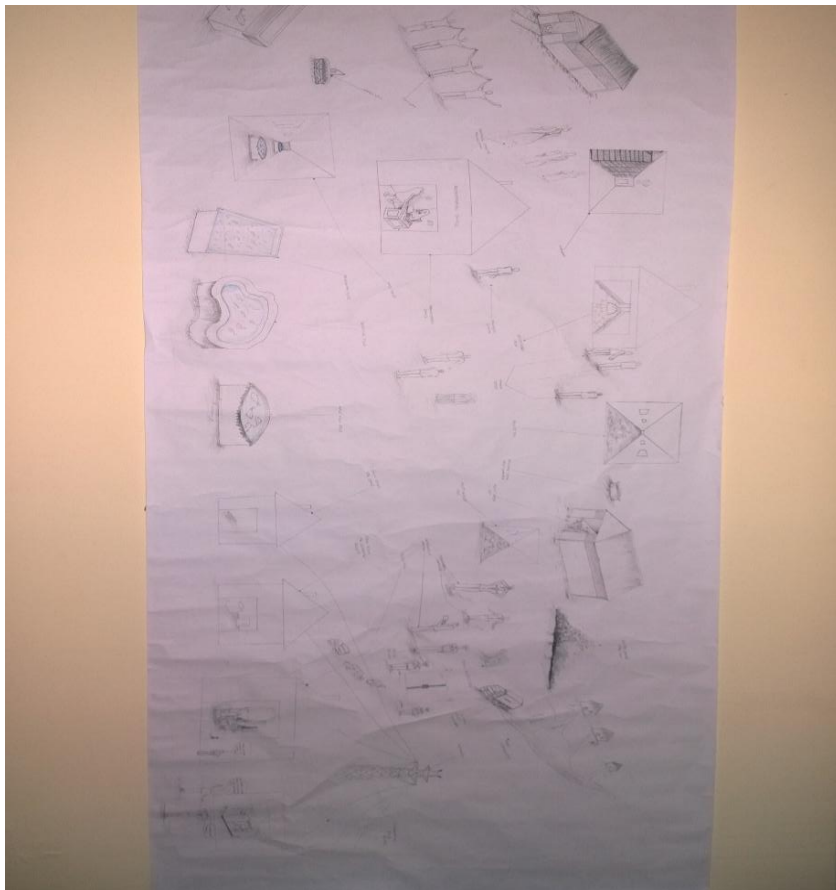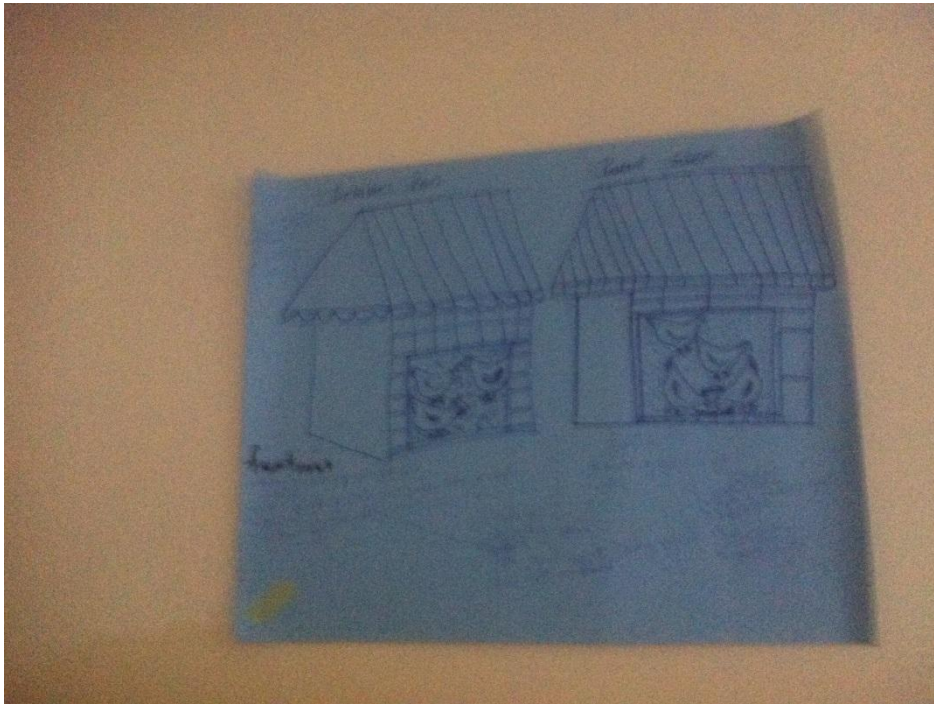
Figure 4.2: The rich pictures used at the workshop on the issue of live-stock mortality

Table 4.6: Summary of the discussion on the issue of live-stock mortality

Issue	Affected departments	Suggestions
Live-stock mortality	• All departments in the production section. E.g. Layers, Cockerel, Pullet, Broilers and Parents' stock. • The Marketing and Sales department that deals with the delivery of products to the downstream customers.	• Committed attention to the practice of bio security[13] measures (e.g. the use of disinfectant foot dip by all visitors to the pen houses) • Improvement of the firm's laboratory • Review of the academic qualification of junior staff to be employed in the future. • Employment of an additional Veterinary Consultant to assist current ones. • Develop critical live-stock feed internally, with good quality control.

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[13] Biosecurity is the practice of effective hygiene in live-stock farming operations with the aim to meet standards set by the regulatory authority.

4.4.13 The issue of aggressive leadership

From personal observations it was noticed that aggressive communication was being used by some staff on a routine basis while they conducted their duties. This was frequently observed to have occurred when team leaders addressed their subordinates, especially the junior staff in the production section and transportation unit (see, table 4.7 for the affected departments). From an informal observation, it tends to show that this is common in the wider society where Organisation A operates. For example, people tend to take on an aggressive approach to establish control and conformity to instructions. Onukwufor (2013) reckons in his research in Niger Delta that aggressive behaviour is prevalent amongst the people right from their youth (see, Ajayi, 2006; Imhonde et al, 2009). Furthermore, it was observed on a few occasions in Organisation A that the subordinates reacted with obvious fear, and my interpretation was that they felt threatened. When I raised this with a senior officer in the marketing and sales department, he simply replied "we don't pet anyone here!"

I undertook follow up interviews with a selection of junior staff, drawn from Sales and Marketing, the production section, the transport unit and the feed mill. The level of aggression was widely criticised by the interviewees. In addition to making them fearful at work, they observed that it had adversely affected their productivity (see table 4.7). They said it was partly responsible for the frequent occurrence of accidents and damages to the products (e.g. eggs) and tools used at work. Some respondents noted that, in some recent severe cases, it has led to harm of the staff involved or the live-stock.

Interviewees also pointed out that the aggression of managers commonly created problems in teamwork, as workers were constantly nervous and would blame each other for errors. This meant that everyone felt insecure and trust-building in teams was difficult. They pointed out that, in such an environment, few junior staff had the courage to participate freely in team practices in the operational system.

Table 4.7, below, presents a summary of the effects of aggressive leadership in the operational system of the case study firm, based on the data collected from the above interviews and my own observations.

Table 4.7: The effects of aggressive leadership on the operational process of Organisation A

Perpetrated by:	Victims	Affected departments	Overall Effects
Middle managers and supervisors	The junior staff in the affected departments (e.g. Layers, Brooding, Feed Mill, Broilers, etc.)	All the departments in the production section; sales and marketing; and the Feed Mill	- Aggressive and irrational decisions by the managers. - Threats to junior staff. - Injuries, breakages of products and breaches of process due to fearfulness on the job. - Low morale and high staff turnover. - Low levels of initiative. - Poor teamwork because

			of blaming and a lack of mutual trust.

After reflecting on these comments from the junior staff, there was a need to address the issue. If I were to run a workshop, however, there was a boundary challenge: it was likely that the junior staff would not be willing to have a discussion on this topic with management present. Therefore, a discussion on who to invite to a workshop was held and agreed upon with the Assistant General Manager, who granted approval.

Among the invited participants were the middle managers who were directly involved with the farm's operations (primary actors as well as owners, using CATWOE terminology, who led operations in each of the affected sections). Some of the invited participants declined to participate due to the sensitivity of the topic; others were absent due to their work schedules; but one particular invitee (the manager at the Broilers department) opted not to attend because he did not see the importance of the topic. Also he said that he believed that aggression is a cultural issue and therefore it cannot be changed.

Those managers and supervisors who were present and willing to participate in the workshop were from the production section and marketing and sales department, where the majority of the junior staff worked. These participants were viewed as actors (based on CATWOE).

During the discussion, the participants (e.g. the Layers and Brooding departments' managers) expressed their opinions. While acknowledging the need to continuously address the challenge of aggressive leadership because it is a hindrance in the operational process, they argued that aggression cuts across all levels of the organisational structure and is not just expressed by managers. These participants shared varied opinions about their usage of aggressive communication in their operational process.

The middle managers and supervisors from the production section traced aggressive leadership communication to the actions of top management, who they said sometimes gave instructions to middle managers based on their own perception and inadequate background knowledge of the issue concerned, which usually results in massive losses. The pressure on the middle managers is then taken out on the workers. An instance cited by a participant was the recent order from top management to stop feeding the fish in the ponds because of non-performance in terms of sales revenues. He stated:

> "Unnecessary cutting down on the live-stock feeds for efficiency reasons by the top management may not translate to effective products for the market.... For an order such as this, the middle managers can only become helpless even when it is certain to result in losses.... Sometimes they [the top management] come down to suggest to us what kind of input materials we must buy, not minding the effects on live-stock development" (manager, Brooding department).

He noted that the feeling of helplessness engendered in middle management breeds anger and resentment. Another participant (a supervisor in the Sales and Marketing department) added to this, saying that the top management should take the lead in curbing aggressive behaviour since they adopt this leadership style as much as the middle managers and supervisors.

This discussion ended inconclusively after about an hour of deliberation. Various participants opted to return to their offices for duties, but they suggested the need to take the topic to top management for further comments.

The points highlighted in the workshop were brought to the attention of the Administrative Manager and other senior staff at the administrative office that handles issues of staff discipline, in a separate round of interviews. This was deemed necessary because, according to the CATWOE analysis that had been undertaken, the office of the Administrative Manager was viewed as both an actor (staff in there have an aggressive attitude), and also an 'Owner' who can take decisions to deal with the aggression due to the position of the Administrative Manager in Organisation A. The proceedings continued in this session and an eventual decision was reached. Among others measures were for managers to develop better understanding and improve communication with junior staff. Also, emphasis was laid on the employment of staff with a minimum qualification of O' levels, and also training newly recruited junior staff. More of this is presented in the later in the chapter.

These respondents expressed the view that sometimes aggressive leadership style could be due to the selfish ego of the middle manager, which in many cases led to unhealthy resultant effects such as undue discrimination in the approach to managing junior staff.

They affirmed that the usage of this style of leadership, by these Managers have been responsible for other systemic issues such as poor task accomplishment in the internal operations of the organisation. They explained that aggressive leadership has led to the creation of a wider gap between managers and subordinates, resulting in poor consultation.

They emphasised the need for all leaders in the organisation to patiently explain tasks to subordinates, as this is a sure way to win their cooperation. In the words of one senior staff member at the administrative office: "If you are too coercive, at times you can't get the best out of them".

The Administrative Manager explained further that, when morale is down, productivity goes down too, which can adversely affect meeting stakeholders' expectations.

In his conclusion to the interview session, the Administrative Manager recounted that the solution to aggressive leadership as an issue in their operations cannot come from just one office and therefore he suggested the need for further discussion with a wider representation of the organisational structure.

A second workshop was organised with the top management. The agenda was to further discuss these issues. Among the participants invited were the Assistant General Manager, the General Accountant, the Administrative Manager, secretary to the Admin manager and one other senior staff at the top management levels of the organisation (the ownership of the entire organisational structure, based on CATWOE). The General Accountant arrived late to the workshop due to an urgent official engagement.

During discussion, all the participants were allowed to comment on the topic. The usage of rich pictures, portraying aggressive relationships (e.g. excessive commands and controls), were engaged to stimulate the interest of the participants, who already had a prior knowledge of the topic (refer to figure 4.2 above for the rich pictures used).

Some of the participants disagreed with the fact that being aggressive is totally unacceptable. They explained that factors such as cultural background, training, and other issues such as low levels of education and the nature or importance attached to the task contributes to the reasons for aggressive communication, depending on the context.

The Assistant General Manager did not agree with this submission, however, noting that, sometimes, people may just not want to work as directed, even when they know of the importance attached to the task at hand. This usually led to aggressive reactions from the boss. He went further to explain that sometimes, some departmental managers get aggressive to overcome the problem of undue interference from other colleagues or subordinates, whom they think may not be helpful in certain circumstances.

These points made by the Assistant General Manager attracted the attention of another participant (the Administrative Manager). He noted that aggressive leadership should not be the norm in their operational system as it can hinder free flow of activities and information that can support the achievement of their main objectives.

All the other participants (e.g. the Administrative Manager, The Secretary to the Administrative Office), at the session expressed their commitment to promoting understanding between the management and the affected subordinates through sensitisation (e.g. workshops) in their operations. (See table 4.8 below for a summary of

suggestions from participants). The session was brought to a close with these suggestions after more than two hours of deliberations.

It was, however, observed that one of the participants (a Manager in the General Manager's office) did not make any contribution and he remained calm and quiet all through the session. It was later learnt from one of his colleagues that his silence during the workshop was due to an earlier argument which he had had with one of the top management participants. A subsequent effort made by the researcher to reach him in a personal interview for a possible comment on the topic did not yield his approval.

Table 4.8: A summary of discussions on the issue of aggressive leadership and the various suggestions from the participants to deal with it

Issue	Suggestion
Aggressive leadership	- Managers to work out ways to develop an understanding with the subordinates on the job. - The need to improve current communications to avoid misunderstandings, especially when the scope of operations expands.

So far, I have presented the main issues of concern across the whole farm. Next I discuss each of the different sections of the farm operational system in turn.

4.5   The Hatchery and Poultry

The information in this section is taken mainly from the initial interviews conducted with the managers (e.g. Hatchery, Layers, |Brooding and Broilers departments). The main product lines operated by the Hatchery and Poultry in the case study farm include: production of broilers for table meat (which are either sold alive or processed and frozen), hatching of day old chicks (which are either sold at that point or reared for 6-12 weeks to be sold as pullets or cockerels). Other products are table eggs produced from the Layers section, live-stock feed and table fish.

In an interview with the supervisory manager at the Hatchery department, he explained that the operational process of the Hatchery and Poultry starts with the sourcing of special chicks known as 'Bovan nera[14]' from external suppliers for the breeding section (the Parent stock). These are reared for about 30 weeks in special pens, and they are meant to lay fertile eggs for the farm's hatchery where they are processed and hatched into day old chicks. These are either sold to customers or reared in the brooding pen houses (an intensive care unit for newly hatched birds), where they are kept for about 6 weeks before sorting into different classes of grower birds (e.g. pullet, broilers, cockerel). The pullet are reared in a different section for about 21 weeks before being transferred into battery cages as layers for the production of eggs. The broilers are reared for a period of 12 weeks after brooding, for table meat. They are either sold live to customers or processed in the Abattoir and sometimes kept in the cold rooms for

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[14] Bovan nera are live-stock chicks specially bred to be reared in separate pen houses, to produce fertile eggs for the production of day old chicks. The fertile eggs are usually processed through the hatchery to be hatched into different varieties of chicks which could be Cockerel, Layers or Broilers depending on the needs at the time.

future deliveries to customers. The cockerels are kept in pen houses after brooding to be sold to customers after 4 weeks.

The main stakeholders relevant to the operational process of the Hatchery and Poultry are the departmental managers and supervisors, the junior staff (pen attendants, security and hygienists), the marketing and sales department, the Feed Mill (which supplies live-stock feed) and the veterinarians, who are in charge of medication. Others are the host communities, the regulatory government agencies and the top management team. These stakeholders influence the operational process of Organisation A in different ways.

Based on my initial interviews, a process map depicting the operational process of the Hatchery and Poultry was drawn up and is presented in figure 4.4 below.

However, before presenting the process map of the current Poultry and Hatchery operational system, an explanatory presentation on the uses of the various symbols for drawing the process maps in this research work is presented in figure 4.3 below: These symbols were based on the work of Damelio (2011).

Legend of symbols

Symbol	Meaning
Rectangle	For activity
Arrow	For direction
Circle	For approval/ control
Diamond (vertical)	For Sorting
Block arrow	For movement or transfer
D-shape	For delays and to express problem situation
Ellipse	For activity that directly add values
Parallelogram	For input or output process
Hexagon	For preparation
Rounded rectangle	For start and stop
Inverted triangle	For storage
Diamond	For input or output from a process

Figure 4.3: Various symbols used to draw the operational process maps- a lean tool used in this research.

start

Problem of improper structural alignment

Source Bovan nera stock from external

Sources Live-stock feed from the Feed Mill or external sources for all stages in the hatchery and poultry section

Parent stock: rears birds to produce fertile eggs Generates Poultry dung in the process

Veterinary and hygiene dept:

Administers medication to parent stock.

Transfer of Poultry dung to the

Transfer of fertile eggs to the hatchery

The hatchery: process the fertile

Top management ask: What do we do?

Government agency suggested

The entire system face challenges of water and power supply

Middle management suggests relocation of Parents stock to a separate location within the farm.

Top management

The veterinary and hygiene:

Administers medication to day old chicks

Transfer waste to the land fill

Transfer of hatched day old chicks to the sales and marketing dept for delivery to

The brooding pens rears bird for 6wks.Poultry waste been generated in the process

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Figure 4.4: Operational process map for the Hatchery and Poultry.

From another round of interviews with the managers and supervisors at the various departments in the Hatchery and Poultry section (including the Brooding, Layers, Broilers, Hatchery, Parent stock, Pullet and Cockerel departments), certain challenges were identified, which were dealt with in subsequent reflective interviews which preceded Lean and Systems workshops.

Apart from the specific issues discussed in this section of the thesis, the Hatchery and Poultry share the general challenges faced by the firm. For example, it was learnt that the issue of security is of paramount concern to the section in meeting the protection needs for live-stock, and to stop thefts of products (e.g. eggs, processed chicken). As earlier discussed, the issues of aggressive leadership, religion and junior multitasking have real impacts on the Hatchery and Poultry. Power supply challenges also affect the operations here; especially the Hatchery and the Abattoir, where the electricity power supply is constantly needed for their operations. The rest of the text below is focused on other operational issues that are specific to the section.

4.5.1   Main operational issues unique to the Hatchery and Poultry

Poor management of poultry waste disposal:

From interviews with the managers at the section, a major challenge faced by the Poultry is that of live-stock dung disposal management. Live-stock dung is the excreta (waste) passed by live-stock. It could be wet, in the case of Layers, or dry live-stock dung (e.g. broilers). This has resulted to a lot of conflict between the host community and the organisation due to the pollutant effects from the Poultry dung which the farm dumps at a site within the host community. It was learnt from interviews with these

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respondents that the firm currently has not found any private organisation that specialises in the management of live-stock waste which mainly comes from the Poultry and Hatchery section.

At the various personal interview sessions with the representatives of the host community, which involved the President, the Secretary to the host community representative committee, and three other members of their group who represent the host community before Organisation A, they praised the existence of the organisation in the host community. They said that the case study firm has given them laudable recognition by offering them a quota in their employment process, which has brought relief to some of their previously unemployed indigenes. Generally, the company has impacted positively in their environment and has resulted in further economic development for the communities.

It was however confirmed by these respondents that the presence of the firm in the locality has also caused a menace in terms of reckless dumping of live-stock waste in the locality. According to them, the operations of Organisation A have caused offensive pollution in the environment and this poses a huge threat to life in the localities. They said the need for development should not mean that their healthy environmental status be compromised. They explained that a clean environmental practice that promotes healthy living is highly treasured by all in the locality. This issue has breached their cordial relationship with Organisation A, making them decline to further negotiations with the organisation unless it meets their request for a complete stoppage of the menace for environmental safety.

As this issue was an organisational concern that went beyond the operations of the Hatchery and Poultry, it was taken to the top management in a later round of interviews with the Assistant General Manager, the General Accountant and the Administrative

Manager. It was learnt that the issue has resulted in the organisation receiving a sanction notice from the relevant government agency, asking Organization A to address it or face further punitive actions from the regulatory government agency.

To address the issue, the top management had attempted to move the waste landfill to a location farther away, but the effort still did not yield the needed solution, as the host community continued to complain. This gradually led to hostility in their relationship with the organisation, which has actually hindered the intention of the top management to enlarge their production capacity, as they nurse the fear of an inability to handle the waste that may be generated from such effort.

Approval was sought from the top management to meet with the relevant government agency that threatened Organisation A (being an 'Owner', that is, having the authority to stop the system from working, based on CATWOE). The aim was to source further information about the issue identified, based on how they are affected and also seek to find what suggestion/s they could make to improve on the situation.

However, the government agency officials refused to participate in a workshop because of their operational practice which disallows workshop or other formal meetings, outside of their own program of operations. Instead, three officers of the government agency agreed to participate in personal interviews. Those who participated are the Director of Environmental Health, the Assistant Director of Environmental Health, and the Head of Department of Environmental Health in the locality where the firm operates. They described their relationship with Organisation A as one of ensuring that the latter's operational process complies with environmental sanitation standards that are legally acceptable. They further explained that they educate operators in the region on health friendly and acceptable standards of operations. They take responsibility to work out modalities to prevent environmental degradation. Furthermore, in their

suggestions to the top management, the interviewees highlighted the need for further development of value from the live-stock waste, especially the wet live-stock dung which they suggest that the farm can use to generate biogas electricity. They explained further that they thought this would be economical and environmentally safe, and beneficial to the farm, having known the background challenge of electricity power supply that is commonly faced by firms in the region where the farm operates. They noted that this would bring a considerable reduction in the pollution impact of this waste on the immediate environment.

> "There are multiple approaches to waste management but the one
>
> we would recommend is the new approach which is the biogas
>
> which involves translating waste to wealth! It leaves nothing
>
> unused; converting all waste to diverse values that are of further
>
> advantages to the organisation if they can implement it"
>
> (Director of Environmental Health).

With the understanding of these identified challenges from the series of personal interviews conducted, the need to embark on further discussion via a Lean and Systems workshop session was presented to the Assistant General Manager. He granted approval after considering the availability of the potential attendees due to the tight work schedules of operation in the organisation. The invited participants were the middle managers, Veterinary Consultants and supervisors ('actors' on the issue, i.e. the internal organisational stakeholders who are directly involved with the generation of live-stock waste, based on CATWOE). The aim was to deliberate on the issue of live-stock dung and possibly develop a solution to tackle the challenge via the exploration of ideas and opinions of participants. This was also aimed at finding solutions while preserving current operational values and the objective of the organisation.

The workshop was captioned 'Poultry waste management and value enhancement for operational process sustenance'. It lasted for about two hours. Among the attendees were the managers from the different departments in the Poultry and Hatchery section and supervisors. Some of these participants were indigenes of the host communities, though they did not formally assume the positions to represent the host communities.

During the workshop, the participants (e.g. managers at the Hatchery, Pullet, Layers, Piggery and the Veterinary Consultants), acknowledged the challenge and the impossibility of reducing the volume of live-stock waste. These participants made several suggestions on what they thought could be done by the organisation to manage and achieve improvement on the situation.

Firstly, they suggested the need for the farm to consider developing further values from their current waste by embarking on the use of maggot from the Poultry dung to supplement feed Fishery section, which they claim would help reduce the volume of waste sent to the land fill. They claimed that this would go a long way to reduce the current cost of feeding in the Fishery section. It was speculated by these participants that maggots are nutritious and healthy for the fish.

> "Maggot contains 55% of protein which can speed up the
> growth of fishes in the pond, and many other competitor farms
> that have access to these waste have started this
> practice"(manager, Hatchery department).

Participants (the Piggery and Cockerel departments' Managers), however highlighted that the volume of livestock dung needed for maggot production is simply meagre compared to what the farm generates in terms of waste. This triggered a kind of

argument by one of the participants (supervisor at the Layers department). He said that the farm does not need to consider the quantity of waste currently generated from the current operations since it is currently faced with the pressure from both the government agency and the host communities. He advised that effort should be focused on addressing the issue at stake, no matter how little the impact may be.

Continuing deliberation, other participants (supervisors at the Parents stock and Cattle Ranch, Managers at the Hatchery, Cockerel and Piggery), cautioned that if maggots must be used in their operational system, the 'maggotry[15]'should be kept at a reasonable distance from other operational sites in the farm and be subjected to continuous clean up after each session of generating maggots, for hygienic reasons. They noted that the use of maggot, though could even lead to an appreciable reduction in the cost of processed feed for the Fishery, care must be taken to ensure a healthy application and rationing with the other fish feed, in order to avoid adverse effects from its usage. As a means to ensure effective health and safety in the consumption of their Fishery products, they advised that fish ponds, from where products are to be sold within three days to customers should not be fed with maggots.

At the end of the workshop session, they suggested that the top management, who are in charge of final decisions, as well as the Veterinary and Fishery departments- who stand the chance to offer further advise on this, should be alerted with these suggestions to find further opinions about the possibility of applying this option as a means to addressing the challenge of live-stock waste management.

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[15] Maggotry is a unit built for the production of maggot. It usually has sections for production and cleaning of maggots before they are administered to Live-stock. It is also requires a considerable amount of isolation and requires a lot of attention to cleaning and prevention of diseases in the environment.

In following the suggestions of the participants in the earlier workshop session, personal interview sessions were held with the supervisors and staff at the Fishery section and the veterinary officers in the farm for further deliberation on this issue and the earlier suggestions of the middle managers at the workshop.

The Veterinary Consultants certified the proposal for approval by the top management. They maintained that this would result in another reduction in the overall waste from the farm and increase its operational values by reducing the quantity of processed feed needed at the Fishery. These Veterinary experts advised that Maggots can become an advantage only when they are well processed free from all potential contaminations that can pose danger to the health of the fish and ultimately the human consumers.

A comment made by one of the interviewed respondents (supervisor at the Parent stock department), was the suggestion for the top management to also consider the use of some of the waste generated from the hatchery (hatched egg shells) into feed supplements for the production of feed for the Piggery. He explained that such would not just help further in the reduction of the overall waste generated in the farm, but also help reduce the amount of feed sent to departments such as the Piggery.

The suggestion for the usage of hatched eggs triggered an interest that needed further exploration. A session of workshop was requested from the management to further discuss in details with participants on how this can be done in their operational process and also find out about the health criteria involved as well as what potential values can be generated if considered. After the approval was expressly granted by the General Manager, the potential participants were notified.

The workshop was captioned: 'process improvement means to generate values from current hatchery waste'. This was suggested by the researcher to the General Manager who approved it, and facilitated the participation of the invited attendants, and captures

their interest in the topic which was meant to ascertain their opinions on the possibility of developing further values from hatchery waste. Among the invited participants are the Feed Mill Manager and supervisors, the Hatchery Manager, the Piggery manager and supervisor and some staff from the veterinary laboratory who are the basic actors to the proposal (i.e. those who are involved with the formulation and processing of live-stock feed).

The workshop session was however a short session which lasted for an hour due to the tight schedule of work across the organisation. All the invited participants were present at the workshop, since they had found the seminar topic critical to the improvement of their working conditions.

During discussion, the Feed Mill Manager, the Hatchery manager offered immediate support to the proposal, suggesting that its usage would provide a good source of live-stock feed supplement. They noted that it would also provide a useful source of calcium carbonate to the pigs-needed for strong bone development.

The Manager at the Piggery pointed out that if its usage could also facilitate efficient flow of 'milk let down' (i.e. free flow of breast milk), in the case of sow[16] that are nursing piglets[17].

Other participants (e.g. the Veterinary Consultant, the Brooding department Manager), cautioned that such process would require a lot of effort to purify the waste especially the 'dead in shell[18]', before certification via a thorough laboratory analysis to ensure health security impacts of the live-stock.

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[16] Sow is the scientific name for an adult female pig.

[17] Piglets are baby pigs that are newly delivered by female adult pig known as 'Sow.

[18] Dead in shell refers to the fertile eggs passed through the hatchery for hatching day old chicks but could not be hatched by the Hatcher, leading to the death of the expected day old chicks in their egg shells.

All the participants agreed that effective usage of this live-stock feed supplement would reduce the current quantity of feed input materials for the Piggery input materials (e.g. the current quantity of limestone input- for bone development in the live-stock), used in the processing of feed for the Piggery.

The session which was rather calm all through due to the interest developed by participants, was ended with the suggestion to contact the top management for further consideration on this issue because they serve as owners of the operational system who have the authorisation to decide and approve the suggestions for implementation.

Noting the suggestions of using current waste to generate maggot for the Fishery and calcium supplement for the Piggery, the top management who have the authorisation to grant approval (owners) were contacted to make request for a possible workshop session in order to engage them in final deliberations. However, this was disapproved due to their work schedules; personal interview sessions with the top management were rather granted which could be conducted at the convenience of the individual respondent.

Others were top management staff (including the General Manager, the General Accountant, the Administrative Manager and other senior officers). They welcomed the suggestions and contributions of earlier sessions of discussion on the topic. They however expressed the challenge that the issue of maggot being used in their operational system is a critical one that would require the consultation of external experts for relevant advice before consideration for approval.

Particularly, the General Manager remarked that the organisation has resolved to productively embark on and continuously practice operational process improvement activities that would require adjustment in its current practices to enhance better result in terms of quality products that can meet stakeholders' expectations. He cited an

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instance where the top management has decided that all the live-stock dung in the operational process would now be managed, either completely eliminated or developed into further values that may be of further use to the operational process. He however recounted that management actions in this direction would be designed at each stage to conform to the rules and regulations set by the government agency that they recognise as a principal stakeholder to their operations. Meanwhile, these top management respondents still nursed the concern that an effective waste management was yet to be achieved.

While observing the operations of Organisation A, it was brought to the attention of the researcher that some live-stock mortality (i.e. dead poultry birds) was moved to the land fill for disposal. This was taken up by the researcher in further interview sessions with the junior staff involved (from the Hygiene and Veterinary department). They explained that it is the normal practice within the organisation to dispose all mortality recorded, which they claim was prevalent at the Poultry section, as early as possible in the morning for health and safety reasons. This observation was mentioned to the Manager at the Layers department to gather further details on the courses and effects of this mortality in the operations of the farm. It was noted that this issue had been discussed earlier as one of the major challenges faced by the organisation. He responded by saying that the issue is a normal occurrence in every live-stock farming but it can become a real challenge when the number of dead live-stock recorded in a given batch become excessive. He noted that all these mortalities add up with the generated live-stock waste that compound the problem of waste disposal management faced by the farm. He explained that in some cases the farm can develop value from these mortalities by processing them (boiling the mortality- dead poultry birds), for live-stock feed supplement for the Fishery.

This suggestion was later taken to other middle managers and supervisors in the Fishery, the Veterinary and Hygiene in different personal interviews. They acknowledged the suggestion and also affirmed that the left over bones can further be processed into bone meal for the Piggery, instead of allowing such leftover bones to add to the challenge of waste disposal currently faced by the organisation.

In order to ascertain further details on this observation (about Poultry waste and it impact on their current operations), a scheduled workshop session was put in place to ascertain their reactions to this suggestion and also to discuss the issue of inadequate power supply, especially the earlier suggestion of biogas made by the government agency in an earlier interview.

Wider selections of middle managers, supervisors and the Veterinary Consultant, who are the main actors to the general operational system, were invited. These attendees were representatives of the different departments and sections of the organisation. The Assistant General Manager was equally in attendance. This extension of boundary for participation was due to the importance attached to the topics to be discussed by the participants earlier engaged, (either in interviews or workshops).

While all other participants were in attendance, the Veterinary and Hygiene department was not represented at the session. This posed some hindrances to some of the discussion (details presented in later part of this chapter).

During discussion which lasted for over two hours, the participants gave an express approval to the processing of poultry mortalities to supplement feed for the Fishery. They however noted that the actual suggestion for an effective take off of the practice could only be made to the top management after a due consultation was made with the Veterinary and Hygiene department for proper advice on the health implications on the Fishery.

They later shifted their focus to the suggestion of biogas electricity made by the government agency as the next agenda for discussion. Some of the participants (e.g. the Hatchery manager), expressed the need for proper feasibility study for effective decision on this proposal, noting that the government agency barely offered this suggestion as an intuitive expression, noting that they are not expert in this profession, which makes it a risk and could be misleading.

Other participants (e.g. the Managers at the Piggery, Broilers departments), agreeing to this suggestion, noted that, if it is properly executed, it would equally yield other benefits to the farm in the area of stability in the current operational process, especially in addressing the challenges of power supply in the farm, help facilitate the pumping of water, the Feed Mill, the Abattoir, and the Cold rooms more effectively. They however reckoned that this would require the involvement of everyone and the approval of top management to make it work. One participant (the supervisor at the Hatchery) cited a known organisation that uses biogas electricity power for their operations within the same region where Organisation A operates. He suggested the need for Organisation A to draw upon this practice to address the need for power and effective waste management. However, no details regarding the financial requirement were discussed at this stage possibly because they have not made any expert consultations at this stage. It was understood to result in a more effective means to address power supply challenges to the organisation, if completed.

This explanation tended to enhance the understanding of the participants about the proposal to develop biogas electricity from their current live-stock waste, as a medium to address the issue of polluted environment in the host communities. They concluded the session by suggesting the need to contact the top management for further discussion on the topic.

One of the participants who had declined to comment during the workshop, asked for a private audience with the researcher, where he raised the question:

> "Who will take the lead? Did the management ask for Bio gas?
>
> I would have asked this in the meeting but for the presence of
>
> our boss who supported the idea before any other contributor to
>
> the discussion. As a subordinate to him (the Assistant General
>
> Manager), I did not want to sound challenging to him"
>
> (Supervisor, Brooding department).

The suggestions raised by the participants at the workshop were presented to the Assistant General Manager in an interview. He suggested the need to involve other top management staff in a workshop to discuss this further, which he later helped to publicise to these top management members.

Among the attendees at the session were the General Accountant, the General Manager, and the Administrative Manager and the secretary to the General Manager- who took minutes of the session. The participants requested for a brief workshop to enable them continue with their busy work schedule for the day.

During the workshop, the top Managers swiftly considered the suggestion to embark on biogas electricity. One of the participants explained that inadequate electricity power supply stands as a major predicament faced by the farm right from its inception. He pointed out that as the operations of the farm expand the challenge expands as well. He brought to the notice of the participants that the firms currently spends nearly a million naira on electricity and generator fuelling to keep power in the farm on monthly basis, which he said is on the high side in terms of their cost of operations:

"The expenditure on this proposed project would yield so much

return especially in the aspect of operational process stability"

(General Accountant).

While other contributors at the work shop appreciated the possibility of improvement via the biogas electricity project, they expressed their dismay that most of them do not have any detail knowledge about its functionalities. Other participants were unwilling to make further comments and they concluded with the decision to search for consultants that can take them further on the proposal. This brought the session to a close after 55 minutes of discussion.

At a later date, it was learnt from the General Accountant that the top management went ahead to consult the services of external experts in biogas electricity projects, who visited the farm to undertake a proper feasibility study on the volume of their current live-stock dung and power supply needs. They advised management to seek to generate wet live-stock waste that can help generate the needed electricity power capacity in the farm. While this could support the project, it was observed that the top management nursed a thought of caution to avoid further conflict with the host community, due to environmental pollution that could be caused by offensive odour from the farm. They therefore decided to embark on this based on their capacity levels.

With this development, the research effort was now focused on gathering relevant data about other operational process live-stock dung from the Hatchery and Poultry section. Details are presented in the next section of this chapter.

4.5.2 Other Issues in the Hatchery and Poultry

In order to ascertain more information about the current practice in Organisation A, an attempt was made to meet with the top management for comments about the identification of operational waste and other issues in the Poultry and Hatchery section. The researcher was rather redirected by the General Manager to meet with the organisational members in the concerned section to address the topic. He explained that they are the practitioners (actors), who may have detailed facts about waste in the section.

Following this, a further waste identification workshop was held after the stream of different workshops and interviews on live-stock waste management, value development and sustenance to explore the possibility of identifying operational waste and seek to improvement via Lean and Systems practice.

Boundary criteria considered for participation in the proposed workshop was the level of involvement within the operational process of the section of the farm, coupled with the level of knowledge displayed by the representative at each potential attendee of the operations of the specific department. They obviously excluded the junior staff (pen attendants) from the workshop, claiming that as they possess limited knowledge of what was required for attendance.

The invited participants were staff of the Poultry and Hatchery section (ranging from the supervisors, the departmental managers, and the Veterinary Consultants). A total of seven participants were in attendance. It was aimed at identifying other operational process waste encountered in the Poultry and Hatchery section, other than the live-stock waste which had been widely discussed earlier on in the data collection process, and generate suggestions on how to either eliminate or manage them for improvement.

Incidentally, none of the departmental managers was present at the session, except for the supervisors and other staff from different departments in the Hatchery and Poultry section.

After the introduction of the topic to the participants, a supervisor opted to leave the workshop citing his disinterest in the topic, noting that live-stock dung is the only waste he knows. This later prompted the postponement of the workshop to another day because other participants present were not ready to participate on the ground of busy schedules, which obviously may actually be due to the refusal of the earlier supervisor to participate.

Before the date of the next workshop, two of the invited managers (in charge of Brooding and Broilers' departments), met informally with the researcher to ask for a briefing on what was expected as they claimed not to understand exactly what was meant by the focus of the workshop agenda. This tended to have been part of the reasons why the earlier workshop could not hold. The researcher gave a brief definition of waste in the light of Lean practice and its effects on an operational process to these managers. They showed a significant level of interest in the topic and promised to sensitise other participants expected in the next workshop scheduled.

Among those in attendance during the workshop were the managers from the various departments in the entire production section of the farm and some supervisors from the Hatchery and Poultry.

The usage of rich pictures was employed to explain the focus of the workshop further and draw the attention of the participants to the main operational activities in the session. This was presented in broad sheet prepared by the researcher (see, figure 4.5).

On presenting these pictures, the participants were fascinated and encouraged to make contributions to the topic after a brief introduction by the researcher. They raised

different areas of waste in their current operational process which were deliberated upon by all participants.

During discussion, it was learnt from one of the participants (Manager at the Layers department), that the task of identification and management of operational process waste is an on-going exercise that evolves with the changes and development of their operational system. Other participants shared this view and classified waste in two broad categories: dependent waste- which they say includes waste generated by the capacity levels of operation (Table 4.9 below presents a summary of the waste highlighted). A good example is the number of live-stock mortality recorded due to the population of live-stock kept at a given time frame. The second kind of waste is the independent waste, which is waste that is bound to be generated in the operational process, regardless of the capacity, e.g. live-stock mortality which must occur on the minimum.

Features
* Processing
* Challenges
* Electrical power failure
* Poor first aid facilities
* Shortage of man power

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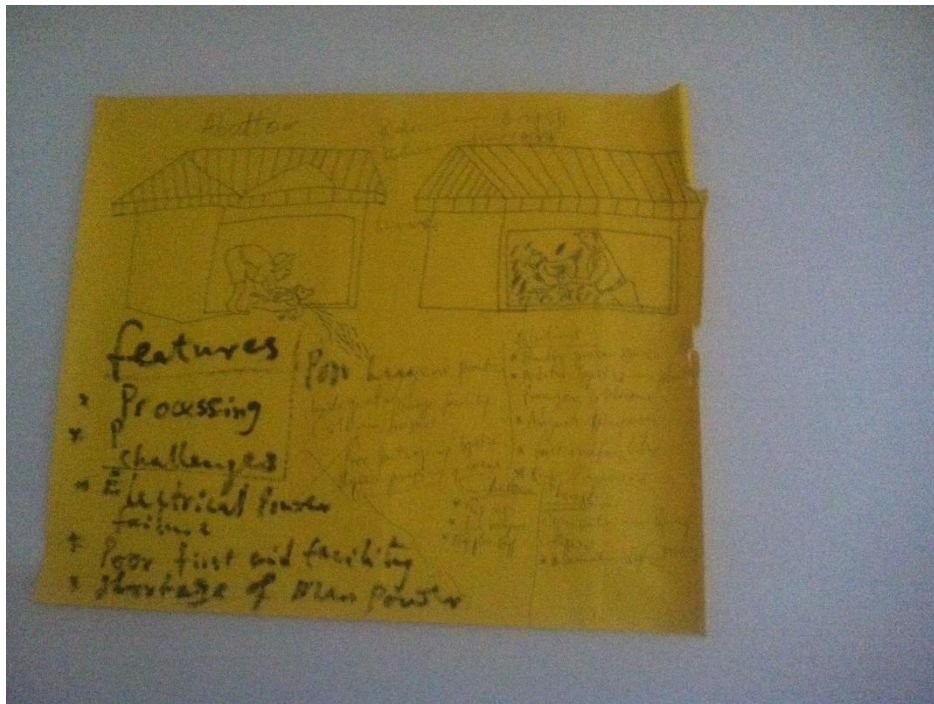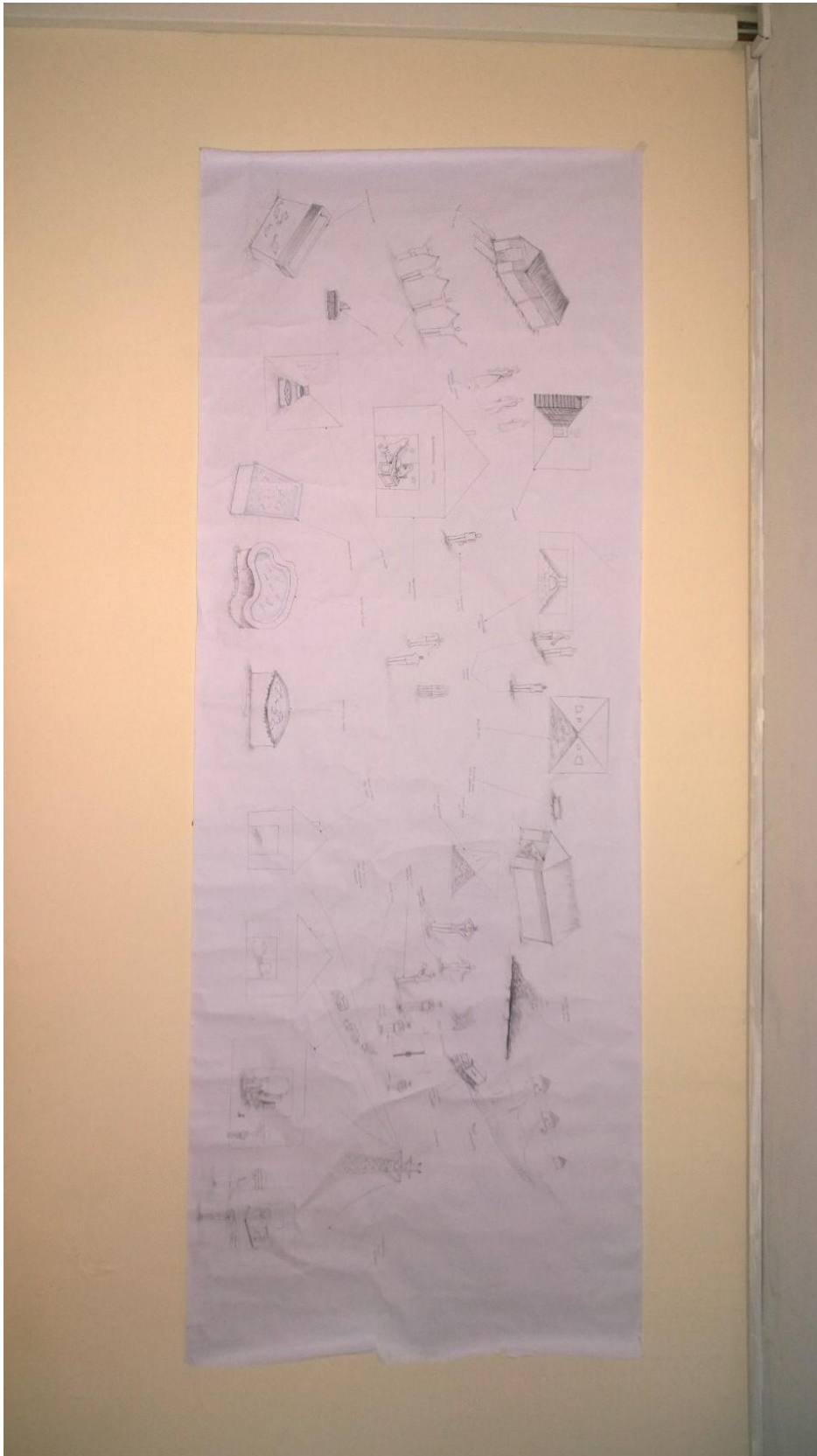
Figure 4.5: The rich pictures used in the workshop session on the Hatchery and Poultry

A number of key activities were identified as waste in their operational process as follows:

Waste due to mismanagement of live-stock feed and medication:

A kind of waste identified during the waste identification workshop in the Poultry section is the use of mismanagement of live-stock feed, for feeding live-stock in the farm (see table 4.9). They explained that this kind of waste can arise from the use of wrong formulation of live-stock feed content giving the wrong feed to certain live-stock or inappropriate timing of feeding. According to a participant:

> "When this blunder is committed, the birds may even eat the administered feed but the risk is that there would be stunted growth and sometimes health problems. And so, the only known way to achieve the best of your expectation from your live-stock is to administer feed and water in the right formulations to them at the right timing" (supervisor at the Layers department).

They noted that if this continues unaddressed in the operational system, apart from the health threats or the risk of outright mortality it can pose to the live-stock, it could also lead to other issues such as poor development of live-stock products. For instance, the Broilers are sold to customers on 'per weight basis', low egg production capacity for the Layers section. The participants pointed out the danger of this kind of waste in the areas of fragile farm products quality such as egg shell, egg yolk which can go a long way to

attract customers' disinterest. They also cited that poorly developed egg shell can easily result in a breakage which they say, usually leads to unacceptable losses that require management to replace the broken ones for the customers.

Workshop participants recounted on their experiences, especially at the earlier stages of the farm inception and, they recognised that the low levels of literacy of the pen attendants was a major challenge leading to this kind of waste in their operational system. They suggested that concerted team practice that embraces the expert contributions of all the concerned managers and staff would stand a chance of continuous solution to this kind of waste. While noting that some of this type of waste experienced in the operational process are traceable to the issues of poor skills and training of the staff in handling certain tasks, they suggested the need to embark on a program of systematic seminars with the junior staff- pen attendants to enlighten them on the importance of live-stock feeding management, especially the less literate ones.

Waste due to inappropriate structural alignment of connected operational activities in the daily operations:

This kind of waste, according to the participants in the workshop, occurs due to inappropriate consultation and planning of the location of different activities that form the relevant systems operated by the Poultry. The participants noted that poor structural planning of pen houses has constituted a considerable breach to the free flow of their internal operational value chain. They cited an example, of the closeness of the current breeding (Parent stock) pen houses to the other pen house, which is claimed to be contrary to modern practice in poultry farming.

Other complained further that this issue has contributed to the health challenges and low egg production experienced in the Parent stock section of the farm. They explained that

in an ideal situation, the Parent stock Pen houses which form a vital part of the operations of the farm since they are responsible for the production of fertile eggs for the Hatchery should be isolated from other activities. Participants pointed out that this would go a long way to preventing the spread of disease and enhance easier monitoring and productivity needed to meet the demands of the customers of the hatchery.

Waste due to poor hygiene practice in the internal operational process:

Another activity that can lead to waste in the Poultry is the issue of poor hygiene practice which is referred to as 'bio- security'. The participants explained that inappropriate hygiene practice can lead to the outbreak of diseases. They recounted that standard farm practice requires an effective bio security practice that is subject to continual review and update in the operational process of the farm. They cited the possibility of sanction by the regulatory government agencies in charge of farming operations, if set standard of hygiene practices are not followed. They also linked this form of waste in their operational process to the presence of inadequate supply of water needed for hygiene practices in the farm. They suggested the need for the provision of these facilities and that effective training on how to put them to use would resolve this challenge easily.

Waste due to wrong choice and use of materials and equipment:

According to the participants at the workshop on waste identification, another instance of waste in the Poultry is the wrong choice of materials used to prepare the live-stock Pen houses (see, table 4.9). For example, the use of sand filling instead of wood shavings for flooring parents' stock pen houses has been found problematic for the live-stock, and can lead to losses in terms of mortality and development of diseases. They also noted that inappropriate use of other farm materials such as charcoal (which is used

to generate heat, needed for the regulation of temperature for chicks at the brooding stage) has also caused alarming mortality in the farm in the recent past. They emphasised that the issue of choice and use of preparatory materials for the pen houses is a delicate one, noting that if adequate care is not taken higher mortality could ensue. The participants suggested that for effective operational use of these materials, the managers and consultants' advise and certification, must be duly adhered to in order to avoid mortality and other losses. They also suggested that all material acquisitions should be done after due deliberations between the Accounts department and the concerned department managers (e.g. Broilers), to arrive at suitable choices that can preserve the operational values and objectives of the section, rather than mere choice of any materials just for efficiency reasons. They explained that all these suggestions would not complete the process for effective practice until adequate attention is given to train and monitor the junior staff (pen house Attendants), who were mainly involved, with the implementation of the process.

Waste due to delays in the arrival of live-stock feed materials:

Delays were noted in the arrival of the farm's Feed Mill's input materials, especially maize, due to the distance involved in sourcing it from the far northern part of the country. Participants explained further that the delays are caused by external environmental issues such as bad roads, threat of armed robbery attacks during transit, delays and due to other stoppages such as vehicular break downs. Further details on this kind of waste is discussed at the later part of this chapter, on the discussion on the Hatchery department which gives a detailed presentation on the depth of its impact on the operational system of the farm (see, table 4.9).

Waste due to management procrastination of decision and actions in the operational system:

Unnecessary procrastination of relevant activities, especially those that have direct impact on the welfare and development of live-stock, was identified as a major means of waste in their operation. According to these workshop participants, this kind of waste is common in their operational system due to top management delays or negligence to approve certain relevant operational activities that can affect the live-stock development in the farm. They explained that this often happens when they lack the needed understanding for such actions in time.

> "If they don't understand what goes wrong, they may decline to lend their support or approval- especially in the release of funds and that can be devastating" (manager at the Brooding department).

They also blame this kind of waste on the chosen management style adopted by top management, regarding certain operational activities in the farm, which tends not to allow for all round team work.

The workshop session was ended with a suggestion by the participants that in an attempt to avoid unpleasant situations caused by any waste identified, the top and middle management team should rather embark on faster decision making process that is void of bottlenecks and delays to match critical emergencies in their operational process.

After the workshop on waste identification was concluded, a supervisor in charge of the Pullet department who had earlier attended the workshop with the other participants met with the researcher in an informal discussion. He raised a particular type of waste which he claimed he did not to remember during the workshop session. He explained that a kind of waste readily present in the operational process is of over-crowded live-stock in a given pen house. According to him, an example of this was when the broiler chicks which were said to be having characteristics of wet live-stock dung thereby making their pens floors easily wet- requiring the attention of the Veterinary and Hygiene staff to clean up and replace with a new Pen house surface floor materials. They said if the issue of over population of birds in the affected pen houses are allowed to continue for more than necessary, proper ventilation becomes an issue and most times it results in quick spread of disease and sometimes, outright mortality of live-stock .

He said:

> "As the birds are growing, the need to adjust their population
>
> density via reduction of the number in each pen house arises"
>
> (Supervisor at Pullet department).

This comment on the issue of live-stock overpopulation prompted a later observation which led to another issue of interest. It was observed that some birds at the Broilers' pen houses were looking unkempt and unattractive. Following the observation, an interview conducted with some junior staff (pen attendants) working in the affected pen houses. They were asked for some explanations on what was responsible for the situation. They responded that it was simply due to the use of sand flooring of the Broilers' pen houses which management earlier thought was more efficient in terms of time, usage and cost. The same respondents noted that this has made a lot of customers to reject the products - especially the ones who patronise live Broilers due to the ugly

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look of the birds. These respondents explained that because of the colour of the sand used to prepare the pen house floor, the live-stock kept become dirty. They reckoned that Management need to grant approval for the use of other preparatory materials such as the wood shavings to resolve this issue which has slowed down the sale of live Broilers in the farm.

Furthermore, based on the contributions of the participants at the earlier workshop on operational process waste identification in the Hatchery and Poultry section, various interviews were conducted with some of the stakeholders who were not at the workshop. This was done to gather further relevant information about the topic of operational process waste at the Hatchery and Poultry section.

The regulatory government agency in this case could be classified as owners (based on CATWOE). This is because they have the legal authorisation to sanction the organisation, if their set standards requirement are not met. Their office was contacted for some explanation about their relationship with the Organisation A as well as their influence on the business of waste elimination in the operational process of the case study firm. As a result, personal interviews with two staff of the regulatory government agency (Director of Environmental Health Officer and the Head of Department of Environment Health), who have had various contacts with the case study farm. This was due to their operational policy which does not provide for any workshop except the ones duly schedule in their annual calendar.

 During the interviews, they noted that effective hygiene practice within the operational system of the farm's poultry became necessary because the range of products offered by the farm has direct impact on 'live-stock and human life'.

> "We have a task of ensuring promotion of health and
> prevention of the spread of diseases. Public health is crucial to

any operational system run by an organisation; this is why our
agency is set up by the government to monitor the sanitary
aspect of their operations" (Director of Environmental Health
Officer).

These comments highlighted the suggestion of the participants at the waste
identification workshop for the need to embark on effective hygiene practice in the farm
to benefit the live-stock and meet standards set by the government agency.

In another round of personal interviews with some top management staff (General
Manager and the Assistant General Manager), each of these interviewees was presented
with a brief summary of the workshop earlier conducted with the staff and managers at
the Hatchery and Poultry section. They reacted to these points in various ways. They
highlighted that an approval for the construction of these new pen houses has been
granted. They also remarked that in the near future, the disserted pen houses would be
put to other uses such as housing new batches of live-stock as the farm plans to expand
its current capacity.

A summary presentation of issues and suggestions about the Hatchery and Poultry is
presented below in table 4.9:

Table 4.9: A summary presentation of the issues and waste in the Hatchery and Poultry section and the suggested solutions.

Issue	Suggestion
Poor management of poultry waste disposal	• Embark on reduction of current waste sent to the land fill through the development of further values from the current live-stock dung via: • Use of wet live-stock dung to develop maggot for the Fishery • Process live-stock mortality into supplement for the Fishery
Waste due to poor hygiene practice	• Embark on effective bio-security practices that meet with the regulatory government agency standards.
Waste due to wrong choice and use of live-stock pen house preparatory materials	• Strict adherence to the advice of pen house managers and consultants in the purchase

	decision these materials
Waste due to procrastination	• Quicker decision process that matches critical emergencies in their operational process.
Waste due to dirty products (e.g. Broilers)	• Use of better pen house floor preparatory materials

start

Transfer of fertile eggs to the hatchery

The hatchery: process the fertile eggs to hatch day old chicks. Generates waste in the process

Source water from the farm bore holes, the new fish farm and the recycling plant for the hatchery and poultry.

The veterinary and hygiene:

Administers medication to day old chicks

Relocation of Parents stock to a separate location for effective farm practice

Source Live-stock feed from the Feed Mill or external sources for all stages in the hatchery and poultry

Source Bovan nera stock from external suppliers

Parent stock: rears birds to produce fertile eggs Generates Poultry dung in the process

Veterinary and hygiene dept:

Administer medication to parent stock.

Channelling of Poultry dung for Biogas Electricity

Generates Biogas Electricity for the farm

End

Transfer of hatched day old chicks to the sales and marketing dept for delivery to customers

Transfer of unsold day old chicks to brooding pens for intensive scare

The brooding pens rears bird for 6wks.Poultry waste been generated in the process

Sorting of birds into diff groups after brooding

Transfer of Live-stock to Broilers, cockerel, and pullet pen houses

Cockerel pen houses: rears birds for 4 weeks

Pullet pen houses: rears bird for 32 weeks before transfer into Layers cages

Transfer of pullet to Layers cages

Layers cages rears birds to lay table eggs

Broilers pen: Rears broiler for 8-12 weeks. Waste generated in the process

Channelling of waste to the bio gas plant

Transfer of cockerel, eggs, live Broilers to the sales and marketing dept for delivery to customers.

Sales and marketing dept: sell all products to customers and deliver reports to Top management

Manages customers feed back to the production section

Collaborate with the relevant

Transfer of processed chicken products to the sales and marketing department

The abattoir: processes chicken products for

Veterinary and hygiene: Administers medication and relevant advice

Cleans up all waste generated in the different pen houses

Figure 4.6: Suggested operational process of the Hatchery and Poultry

The above presentation in figure 4.6, about possible changes for the future in the Hatchery and Poultry section were captioned based on the interactions, suggestions and comments of the participants in the research process. This is a more developed version of the presentation which was earlier jointly drawn by the participants.

4.6 The Feed Mill

Interviews with top management staff (e.g. the Assistant General Manager), revealed that Organisation A operates a functional Feed Mill which plays a vital role in their operational system.

At the Feed Mill, preliminary personal interviews were scheduled with the manager and supervisor (actors), who are in charge of the processing of live-stock feed at the Feed Mill. They gave a narrative of the basic operations of the Feed Mill, noting that the Feed Mill was established to source input materials and process live-stock feed for the different live-stock sections in the farm, ranging from Fishery, Pullets, Layers, Broilers, Piggery, Cattle, the Parents stock and others. It also mills live-stock feed for external customers who are mainly competitor farms. According to these interviewees, a

breakdown of the different live-stock feed produced at the Feed Mill includes, Layers' mash, the Chicks starter, Broiler starter, Broiler finisher, Grower mash, Pig mash, Fish feed, and Cattle mash. They explained that the establishment and running of the Feed Mill was born out of the need to have access to processed live-stock feed that can meet the exact nutritional needs of live-stock in the different sections of the farm, which is difficult to realise from live-stock feeds sourced from external sources, which even commands higher costs compared to the internally processed feed.

> "The live-stock feed from our mill is simply richer and better
>
> and a lot cost effective compared to what we find out there!"
>
> (Supervisor at the Feed Mill).

From further interviews conducted, it was learnt that the main stakeholders (actors, in the case of CATWOE) to the Feed Mill are the input suppliers, the Accounts and Finance department who audit the operations of the Feed Mill. The Feed Mill works together with the Veterinary and Hygiene department, responsible for certification of input materials and formulation of live-stock feed (the various percentage content of input materials to provide the needed nutrient for, live-stock development), for onward processing.

The main activities at the Feed Mill are presented below in figure 4.7. This process map was drawn based on the data collected from the various participants in the initial interviews, which was later presented at the workshop, to aid further deliberations:

Start

Source input materials :

E.g. maize, lime stone, wheat offer, ground nut cake, and others

The Veterinary and hygienic department:

Certifies input materials for processing.

The Feed Mill:

Distribute Live-stock feed to the various pen houses, e.g. Broilers, Piggery, Fishery etc, and transfer Live-stock feed to the sales and marketing department

The Feed Mill delivers report to Top management

The challenge of delays in the arrival of input materials at the Feed Mill sometimes lead to down time and shortage of Live-

Source already made Live-stock from local retailers to cover the gap

Top management asks: what can we do to permanently solve the challenge of delays in the arrival of input materials at the Feed Mill which sometimes lead to down time and shortage of Live-stock feed

Top management:

Sack our current suppliers and commence direct acquisition from the seller in

Top management decide to have the farm in the north for an experiment.

Offers to buy produce from Host community farmers but

Host community farmers are willing to provide the farm produce but demanded support from the organisation.

Middle management suggested that the input be sourced from host communities and the farm should be located in a nearer location.

Top management asks: Do we need to have our farm in the north or from the host communities?

Do we need our own farm?

N

Y

Stop

Figure 4.7: Current operational process of the Feed Mill.

4.6.1 Operational Issues at the Feed Mill

From interviews conducted with some junior staff, middle manager and Supervisor at the Feed Mill, it was learnt that the challenges of junior staff multitasking, power supply have negative impacts on the operations of the Feed Mill. For instance, the Feed Mill has had breakdown due to sudden surge in power supply. Other general issues such as

religion, security and aggressive leadership are acknowledged to have significant influence on the operations of the Feed Mill.

Further details about specific issues challenging the operations of the Feed Mill were gathered from pre workshop interviews which later informed the conduct of different Lean and Systems workshop sessions in the data collection process. Details of these are presented in this section.

The Issue of Delays in the Arrival of input materials:

The main issue that tends to be peculiar to this section of the farm is that of delays in the arrival of input materials for the Feed Mill (e.g. maize, wheat offer, ground nut cake, lime stone and others). While this issue was extensively discussed earlier during the Lean and Systems workshop on operational waste identification at the Hatchery and Poultry, certain further details were gathered from the perspective of the Feed Mill.

In an interview with the manager at the Feed Mill, it was learnt that management opted to source these input materials from retailers around at higher costs and inadequate quantity in their quest to cover the gap of delays. This was confirmed by a top management staff in another interview, explaining that the delay experienced so far is due to the distance involved with sourcing these materials from the northern parts of the country.

> "When we do not get these materials, we turn to alternative sources to feed our live-stock but this has always come with some problems, ranging from health to mortality challenges" (Supervisor at the Feed Mill).

However, upon approval from the top management to meet with some of the current input suppliers in a round of individual interview sessions, they pointed out that the delivery time has reduced significantly.

> "We acknowledge the challenges involved in the delivery of these products but if they want higher quality products, they should be ready to pay more!" (Current maize and lime stone supplier).

These input suppliers suggested the need for management to invest more resources through a bigger warehouse built to store inventory of input material which they think can facilitate unhindered production process, but management declined to this in another interview, owing to the cost involved and the negative effects in terms of higher inventory costs.

In a follow up interview with some of the top management staff (General Accountant and Administrative Manager), they noted that, at a point they felt that the input suppliers were not honest in the delivery of these input materials and therefore decided to consider terminating their contract of supply and decided to embark on direct acquisition from the northern market where these input materials are sold. They also pointed out the issues of poor quality input materials that do not meet the standards required for feed processing in the farm. They realised that this challenge has in some ways contributed to slow pace development as well as mortality of live-stock in the farm in recent times.

> "We can no longer trust our suppliers for effective on time quality products deliveries, and this worries our operations" (General Accountant).

Further interviews were conducted with some middle managers and senior supervisors from other sections of the farm (e.g. Fishery, Layers, Piggery), who are customers to the operations of the Feed Mill (i.e. beneficiaries or victims of the Feed Mill's operation). They showed immense concern about the sourcing of input materials for the Feed Mill. They acknowledged that the choice to go directly to the input material source market by top management was made possible by the employment of some senior staff in the organisation that are from the northern part of the country who understand the vernacular language and other cultural issues, to be able to engage these northern traders directly. They explained that this decision would not distort their operational focus, noting that management would be mindful of the primary operational objectives while dealing on the input materials acquisition. It was also learnt that even this effort could not tackle the issue of delay and sometimes the products delivery come with some contamination (e.g. input materials with chaffs) which requires further effort to clean up (e.g. filtration), for effective use.

According to the General Accountant:

> "We have not got it yet but we would continue to work until we
>
> find a solution".

At a point, some staff interviewed on this issue who are also customers in the various sections of the farm, suggested that these input materials especially the maize which has highest percentage need in the farm's Feed Mill, can be sourced from the host community farmers who currently cultivate other crops such as pawpaw, rice, yam, if they are sensitised and assured that the farm would buy such produce.

This suggestion from these staff members of Organisation A was taken to top management in an interview session (e.g. Assistant General Manager), where the

approval was granted on the request for further meetings with the host community farmers for a possible supply of the input materials.

The researcher, having learnt from interviews earlier conducted that the organisation has suffered a breached relationship with the host communities, and that would not permit a meeting between the parties, a separate workshop session was scheduled with the host community representatives. Further conviction and persuasions were made via the involvement of some staff who are indigenes from the host communities as well as Organisation A's legal adviser who is also a well-known indigene from the host communities.

At the workshop session which lasted for about two hours, the host community representatives present were up to 16 in number. According to them, they honoured the meeting due to their unwavering trust in the legal adviser of the case study firm, whom they have respect for. During the session, the researcher introduced the topic to participants and the discussion went on cordially. Participants welcomed the development and agreed to supply the required input materials. But they demanded support from the company in the areas of take-off financial grant, maize seed for planting, building of storage facility, and a concrete agreement on the pricing of produce.

At the end of the session, the participants made the assurance that the organisation would not need to pay the current input importation charges to the host community treasury, since the products concerned would now be sourced from the local farmers.

These facts about the willingness and condition for the cultivation of the input materials by the host community farmers were presented to the organisation members in a subsequent workshop session.

As actors in the process of using input materials – participate in the formulation of live-stock feed, as well as customers- who benefit via the supply of milled live-stock feed to their various departments. The middle managers were later engaged in a workshop which lasted for about an hour to further deliberate on this topic before meeting with the top management.

At the beginning of the workshop session all the managers from the production section were present including the Feed Mill Manager and the Veterinary Consultants. The researcher presented a drawn process map of the operation of the Feed Mill (see, figure4.7 above), to participants which was drawn based on the initial interview responses from the various interviewees at the initial stage of data collection process about the Feed Mill. Similarly, drawn rich pictures, depicting the situation at the Feed Mill were presented in the session to encourage participation and possibly stimulate their interest in the topic (see, figure 4.8). Rich pictures facilitated participants' interest in the session. A brief information about the outcome and comments from the host community farmers about the possibility of getting input material supply. They were encouraged to make further deliberation on the topic.

The participants gave their support to this development, explaining that maize and other input materials can be acquired in higher quantities and stored in a silo (is a constructed facility meant to preserve and store grains -e.g. maize, for longer shelf life), or the farm's warehouse, during the surplus seasons and they if they are properly stored, they may not go bad even after two years.
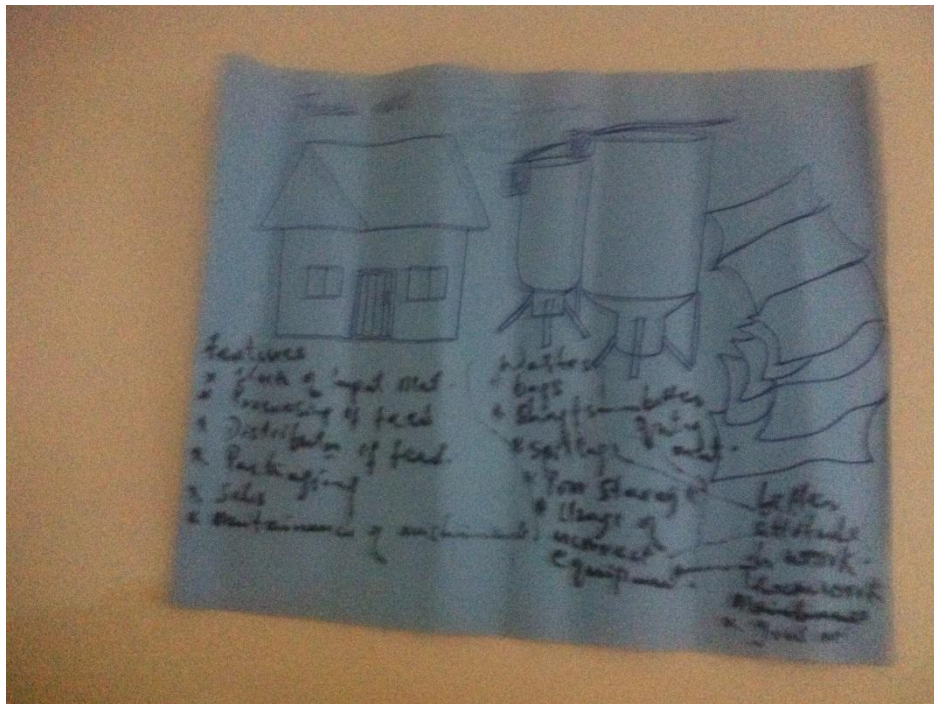
Figure 4.8: The rich pictures used at the workshop on Feed mill

While the session wound up after about 75 minutes of discussion without arguments among participants, they unanimously suggested the need to contact the top management for a final deliberation on this proposed idea.

This same idea was taken to another workshop with the top management- who in this case could be seen as the owners that can stop or implement any decision reached. Those in attendance included the General Accountant, the Assistant General Manager, the General Manager and the Administrative Manager. The aim was to source data about final decision that might be chosen for action in addressing the issue of delay in the arrival of input materials at the Feed Mill. It was also scheduled to deliberate on the possible values that such decisions can offer to their operational system improvement, with due consideration to the affected stakeholders' expectations.

During the session, they agreed earlier on to make supportive provisions to these farmers at the initial stage, and also thought the idea would help in reinventing their cordial relationship with the host communities. Later, they expressed the fear that they cannot guarantee the trust of these local farmers and they may not also be able to enforce adequate compliance if these farmers happen to breach such agreement. They also argued that it would require a laborious effort to attempt to teach these farmers about modern commercial farming involving the application of different methods, which the host community farmers may not have been familiar with. They expressed their worry over the huge cost required for acquisition and maintenance of the machines needed to embark on this proposed project using these input materials, in the northern part of the country, where they currently source these materials. Although, it is a far distance, coupled with the inherent security threats in the proposed location, they noted

from their feasibility study, that it is cheaper in terms of cost; the lands are more fertile for maize and other crops needed.

In their conclusion at the end of the workshop which lasted for about an hour and half, they agreed to buy from these local community farmers at the same price at which these products are sold in the northern markets where they currently source them from, (i.e. if they can produce on their own, without any support from the case study firm).

In order to explore the reaction of relevant organisation members who are at the hub of implementation of any proposed change and also being affected as end users of the products from the Feed Mill, request for another workshop session, which was later granted after an earlier cancelation due to busy schedule of activities. The agenda was to deliberate further on this proposal reached by management in the earlier workshop, on cultivating its own farm, and refusal to support the host community farmers.

Invited participants were the Middle management staff whose departments' operations depend on the functioning of the Feed Mill. Some of the managers expected were absent due to other unavoidable engagements with the operations. Some others who were earlier present had to excuse themselves to leave for their duties. Some of them were however mandated to attend by the Assistant General Manager who recounted that the session was important and could possibly be helpful to their operations.

During discussion, which lasted for about an hour, participants expressed their worries about the proposal, and argued that the distance involved would still form a reasonable challenge to the proposal. The Host communities would completely lose the opportunity to participate and become happier with the operational process of the farm in this area. They noted further that the effort would still face the challenge of not being able to resolve the current issue of delays in the arrival of these input materials currently

experienced at the Feed Mill. They rather suggested that management should consider having the proposed farm in a nearer location that can be easily accessed.

> "If we should go that far to the north, it would amount to
> disservice to the communities, and in the ultimate, it would end
> up as a good plan but in the wrong location, which can distract
> the current operation in the farm" (Hatchery Manager).

They also reminded the top management of the problem of drought in the north and raised the question of whether the top management was ready to embark on irrigation which is the main source of water for farming in the northern part of the country. While they did not support the idea of having a concrete agreement with the host community, because of possibility of risk of breaches in the future, they spoke about the possibility of encouraging local farmers to produce and sell to the company since the organisation has a plan to continuously increase their operational capacity in order to meet the downstream customer demands. They observed that this would definitely mean an increase in the quantity of input required for the operation of the Feed mill in the near future.

> "We would therefore suggest that top management looks at the
> possibility of having the proposed own farm in the nearest
> possible location and let that serve as an example for the host
> community farmers to emulate'. 'If the host community
> farmers are aware of our own farm, they would be happy to
> complement with their produce" (manager at the Feed Mill).

While these participants advanced their suggestions during the discussion, the General Manager explained the stand of the top management in a final session of interview on this issue. He noted that the firm opted to having the farm in the northern part of the

country as earlier proposed, on the premise that it is an experimental venture that would inform a permanent decision in the future.

As the quest to find a working solution to the challenge of input material inflow to the organisation continues, it was observed on an occasion that the top management were re-considering having a renegotiated supply contract with some input material suppliers who were earlier sacked. This became evidenced as the General Manager and other top management staff were seen having private meetings with a selection of these input material suppliers.

Interviews were requested with top management staff (the General Accountant, the Administrative Manager, and the General Manager). But these requests were turned down by all other respondents except the General Manager. They stated confidential organisational reasons as the cause of their refusal to honour the requests.

The General Manager explained that the earlier proposed direct input material supply has not been able to address the challenge specified. He noted that it was marred by poor quality input materials at higher cost and even at the expense of the services of the staff involved. He recounted that the input materials acquired directly had caused a massive mortality and other health challenges to the live-stock, coupled with the milling machines break down, all within the short time of trial.

The General Manager noted that the firm re-awarded the contract of input material supply to a selection of suppliers with an agreement to carry out product test on every batch of input supplied before payment can be made for quality standard reasons. Nevertheless, he affirmed that further discussion on this issue with any staff of the organisation would not be granted to the researcher for confidential reasons. The General Manager explained that the organisation members involved with the direct acquisition were duly investigated by the management and a decision was reached to

recall some of the suppliers, while different levels of disciplinary actions were awaiting all erring members of staff involved with the project.

To gather further data about the current operational process waste at the Feed Mill, a workshop session was agreed with the manager and staff of the Feed Mill.

The aim was to identify the challenge of waste in the operational process of the Feed Mill. It also was meant to embark on a root cause analysis of identified waste in the operational process of the Feed Mill as well as seek the opinions of the participants on the solutions to the waste challenges in the operational process of the Feed Mill (see, table 4.10 for a summary of operations and waste at the Feed Mill).

Participants at the workshop session were mainly the staff and the manager at the Feed Mill. While an attempt was made to use rich pictures to buttress the topic, the participants did not allow the usage, due to the shortage of time and their preference to rather make contributions based on their experiences.

Waste due to inappropriate use or machines malfunction at the Feed Mill:

The participants expressed the issues of wrong use of equipment in milling which they say can either result to poor quality live-stock feed processed or outright spillage of feed products leading to losses. An example of these losses was highlighted to be live-stock Mortality due to inadequate supply of the correct quantity of processed live-stock feed leading to Malnutrition, but the participants refused to comment further on this rather asking the researcher to contact the Veterinary and other Production departments (e.g. Layers, Brooding, Broilers, Piggery), who deal directly with live-stock. They reckoned that such were rather outside the purview of the departmental operation and could attract punitive sanctions by the top management.

Waste Due to Machine Break down

Another kind of waste in this direction is the case of machine breakdown while milling. They noted that this is due to poor quality maintenance culture that affects the machines while in use for processing- use of substandard parts to repair broken equipment. A participant (staff at the Feed Mill) in the session gave a narrative of an occasion whereby the Feed Mill could not mill live-stock feed for the farm due to the input materials that were not dried enough for use which led to some major damages on the machines in the Feed Mill (see, table 4.10).

The Feed Mill Manager in his comment recounted that these issues have led to top management concerns on what could help avoid these challenges in recent times since the Feed Mill has vital function with the operations of other parts of the farm. A supervisor at the Feed Mill also attributed the cause of this challenge to the issue of low educational qualification of some staff at the Feed Mill, and the issue of staff shortage which he noted as a general issue in the farm, resulting in the deployment of some staff from other departments, who do not have the requisite expertise to help in the milling process, especially during peak periods. They suggested the need for management to start running operational shift to reduce the tension at the Feed Mill during peak periods of demand and sensitise the Logistics and Acquisition department to ensure that better quality parts machines are installed for use at the Feed Mill. They explained that this was mainly due to general staff shortage experienced in most parts of their entire operational system.

They also advised on the need for adequate filtrations of input materials for quality live-stock Feed Milling. Managers have the duty to intensify the monitoring of operations at the Feed Mill to ensure proper use of equipment but this would only be possible if the junior staff and even the technicians are ready to comply. They emphasised on the need for an effective equipment turnaround maintenance culture that

would ensure only qualified technicians are allowed to carry out maintenance of equipment.

The session ended after about two and hours of discussion. The drawing of a new process map of proposed future operational flow at the Feed Mill which would enhance necessary improvement was done with the participants (who were mainly staff of the Feed Mill), in a simple form.

Table 4.10: Main issues and suggestions made by participants about the functioning of the Feed Mill.

Issue	Decision or suggestion
Waste due to machine malfunction	• Use of higher quality parts to fix machines • Effective equipment turnaround maintenance
Delays in the arrival and poor quality input materials	• Cultivate own farm on these products • Source input materials from host community farmers • Embark on direct acquisition from the sellers at the northern markets. • More provision for filtration of input materials for quality live-stock Feed Milling. • Re-negotiate the contract of supply with the input suppliers to meet required quality and quantity

Presented in figure4.9 is an improved version of the earlier process map that was drawn with the participants at the workshop session on waste identification in the Feed Mill.
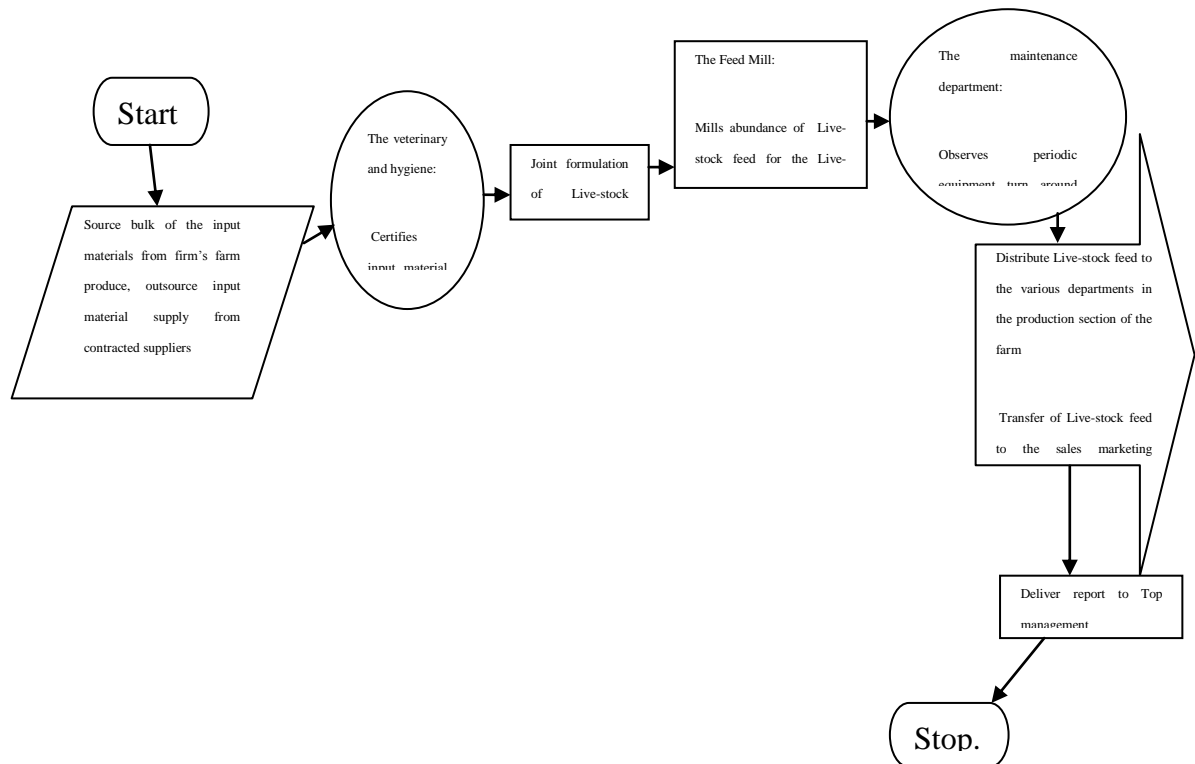
Figure 4.9: The new operational process map for the Feed Mill.

4.7   Fishery Section

From the initial interviews with the manager, staff and supervisor at the Fishery, it was learnt that the Fishery section rears different sizes of fish, ranging from table size- adult fish for consumption to fingerlings- for sales to customers- competitor farms. The farm maintains a current capacity of 200,000 adult fish which are kept in constructed fish ponds where they are reared for the market (sold on per kilogram basis).

Live-stock development process in the Fishery starts from the Fish Hatchery of the first stage referred to as 'Lava'. The Lava develops into 'Fry' between three to four days. The Fry develops into Fingerlings which later develop into Juvenile between three to four weeks. At the Juvenile stage, they are made to spend about 4 weeks. These are either sold to customers (competitor farms) or transferred to the adult ponds to be reared

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for about six to eight months before they are sold to customers. The basic reason for the transfer from one pond to another is to create room for healthy development.

The main internal stakeholders involved with the operations of the Fishery section are the Feed Mill, the top management, Security and Accounts and Finance departments.

Other principal actors to this section are the managers and staff attendants who are in charge of daily operations, the Veterinary and Hygiene- in charge of medication, feed certification, the customers- both the institutional buyers (competitor farms) or adult fish buyers, the Feed Mill and the Administration department – mills special live-stock feed for each of the stages in the development process of the Fishery.

The Fishery depends on the water supply needed to keep the aqua culture functioning. Aqua culture is the act of keeping aquatic live-stock products (e.g. fish) in the water for rearing purposes. According to the managers, the water in the ponds is subject to renewal between four to five days interval, depending on the nature of contamination, due to the discharge of live-stock feed deposits. They explained that the intention is to sustain the oxygen levels, to enhance healthy development of the live-stock and prevent health challenges in the Fishery.

The current activities at the Fishery are presented in figure 4.10 below, based on the explanations of respondents to the initial interviews.

```
Start

The hygiene and veterinary department:
Changes the water and administers medication to the entire system at every

Source treated water to fill the ponds.
Sources Live-stock feed for all stages in the

Fish hatchery:

Transfers products to the fry ponds for

The Fry Pond:Rears products for 3-4 weeks

Transfers products to the fingerlings pond

The fingerlings pond: rears products 6-8

Transfers products to the sales and marketing department's aquarium for delivery to external customers.

The Juvenile pond:
Rears products for 4

Transfers products to the adult ponds

Adult ponds: rears products for 6 -8 months

Transfer of adult fish products to the sales and marketing department's aquarium for delivery to customers

Report delivered to Top management has the following problems:

Top management asking what can

Top management ordered reduction in

Top management asking: do we

Middle managers suggesting: No!
Change the marketing approach
Process all adult fish via smoking for the market
Veterinary: No

Top management asks: should we buy the new fish

Middle management supports the idea.
Advise the need to develop

Top management consult the services of a

Deliver a positive result in favour of the

Top management approved the acquisition of the new fish pond. With the expectation of a solution to water

Stop
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Figure 4.10: The current operational process of the Fishery.

4.7.1   Main Operational Challenges at the Fishery

As part of the main organisational system, the Fishery section suffers negative impacts in the areas of security of live-stock, junior staff multitasking, aggressive leadership etc. However, having presented a detailed discussion on these general issues earlier in this report, the focus of this section is on the specific issues that affect the operations of the Fishery section. In order to ascertain the current operational practices in the Fishery section, interview sessions were scheduled with the manager and staff in charge of the section. A summary of these issues and waste in the Fishery is presented in table 4.11.

The challenge of inadequate water supply

In their responses to interviews, the location of the farm has low level underground water table which made the accessible amount of water so little, compared to what was required for use in the farms. This issue has compelled management to buy water from other sources to complement the volume needed at higher cost, but sometimes these external sources of water are not reliable due to the problem of impurity, which affects the operational development of live-stock in the farm especially the Fishery and Poultry. This challenge had compelled top management to gradually consider the closure of the current Fishery section of the farm. This is due to what they described as 'unbearable,' a challenge they said has made the fish lose weight, and raising other issues of concern in their quest to satisfy their range of customers. This apparently made them question the viability of this section of the farm.

A further interview was conducted with the Assistant General Manager on the current issues at the Fishery. He explained that the persistence of this issue of no water has led to the resignation of the Manager in charge of the Fishery. And this has led to the stoppage of the production of fingerlings for customers (competitor farms) which is only possible because of the expertise of the out gone Manager, who is yet to be replaced. He noted this situation has left the management with the sole option of considering closure, despite huge investment made in the section. He explained that the organisation spends so much but the situation seemed to not be improving. He highlighted partial neglect in terms of provisions- especially in the reduction of live-stock feed supply due to poor performance, as part of what was mainly responsible for the challenges facing the Fishery section of the farm.

According to the respondents, Fingerlings are a new batch of fish at the third stage of their developmental process, which are about 3-4 weeks old. In the practice in Organisation A, they are either sold to external customers or reared further to be transferred to the juvenile pond where they are further reared before a final transfer to the adult ponds.

A further personal interview was conducted with a Veterinary Consultant who participates in fish pond hygiene services and administration of live-stock medication. He recounted on an earlier suggestion of the possibility of installing a water recycling system to facilitate the reuse of water in the Fishery as a means of addressing the challenge of inadequate water supply. According to him, the top management had approved the project and the contract of installation awarded. This effort however failed owing to power supply issues coupled with the adverse health effects of the purification materials used.

More interviews were carried out with staff at the Fishery and the Marketing and sales departments, who are in direct involvement (actors) with the production, marketing and sales of fish products, to find out the reasons for the acclaimed failure of the Fishery. It was learnt from these respondents that part of what caused the low sales performance in the Fishery products-especially the adult fish, is the poor sales strategy applied. They explained that poor sales strategy resulted in the quick sale of all the heavy weighted fish products to customers and leaving the less weighty ones which are not easily demanded by the customers.

Upon confirmation of their availability, these facts raised by the staff at the Fishery and the Marketing and Sales department were taken to the middle managers in the entire production section as well as the Sales and Marketing Manager and Supervisor in a workshop. The session lasted for just a little less than an hour. The aim was to get their reactions to these issues within the Fishery department.

The problem was acknowledged by the participants and they suggested that all current matured fish stock be processed via 'smoking',[19] which they said has been confirmed to be in demand by a segment of customers in the market who they say patronise local fisher men's products. They noted further that smoked fish has very long shelf life and it is safe for consumption.

They participants (e.g. managers at the Layers and Pullet departments and Supervisor at the Fishery), made the suggestion for the need in the future, to review the current sales strategy for the fish products to enable the sales on per pond basis. That would ensure all the fish in each pond opened are sold completely instead of the current selective sale that created the problem of unsold less weighty fish product in the ponds, leaving them

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[19] According to the respondents, smoking is a method of processing live-stock products done by using heat, usually from a fire source to dry up the watery content of the product to preserve it for use.

with the challenge of higher cost of keeping these unsold fish products in the ponds. They advised the need to notify the current customers to the Fishery section on this decision.

The session ended with the remark by participants on the need to improve on the current marketing effort in order to ensure the fish products are easily converted via sales.

In order to present these suggestions to top management, a workshop session was scheduled to have their final decision on the issue with the Fishery. Just before the date agreed for the workshop, the Assistant General Manager hinted on the visit of the company's Legal Consultant as well to discuss the issues challenging the operation of the Fishery. So, the researcher was permitted to attend and invitation was extended to the middle managers in the production section, the Veterinary Consultants, the manager at the Sales and Marketing department and the top management.

During the discussion, Legal Consultant of the organisation presented an offer of a fish farm meant for sale at a distance (about 10Km or 6.5miles) from the farm. This came at a time management wanted to shut down the Fishery. The top management acknowledged the offer and promised to appoint a preliminary feasibility team to help ascertain the features and viability of the proposed farm. The report from the feasibility study showed that the water table was certified in the proposed farm as good and very high and would be able to provide a source for adequate water supply to both the new farm and the current farm.

Upon the delivery of this report, the top management had another meeting in which the researcher was invited. The agenda was to deliberate further about the Fishery. Among the participants were the General Accountant, the General Manager, the Assistant General Manager, the Administrative Manager, the Veterinary Consultant and the Chief

Security Officer. Others were the middle manager in Sales and Marketing and a Supervisor from the Fishery department.

During discussion, participants (e.g. the Veterinary Consultants) raised two questions: 'whether we must shut down the Fishery completely' or 'do we raise our hard earned fortune for acquisition'? This triggered a new debate among members of the organisation which later ended up in favour of acquiring the new farm facility. They noted that the acquisition would lead to the expansion of the fish production capacity from the current 200, 000 to between 300,000-400,000 adult fish, excluding the fingerlings and others. These participants acknowledged the fact that the option of expansion on the Fishery via making the acquisition would obviously pose a new marketing challenge to the firm. It was also agreed that the Farm's Consultants would need to have a periodic scientific analysis of the water to access the suitability for use in the farm, for live-stock health and safety operational reasons.

The top management finally decided to rework the abandoned water recycling system with better purification materials and more sophisticated machines to enhance the current water supply in the near future. They concluded the session with the remark that these new plans would at least sustain and help overcome the challenge of water in the Fishery and other sections of the farm.

A waste identification and management workshop was organised with the staff, Veterinary Consultant at the Fishery (a summary of waste in and issues in the Fishery are presented in table 4.11). Having learnt that participants were literate, they were presented with drawn rich pictures of some main activities in the Fishery that portrayed images of the current situations in the department (see, figure 4.11), and the current process map of the Fishery section, based on the data gathered from earlier interviews.
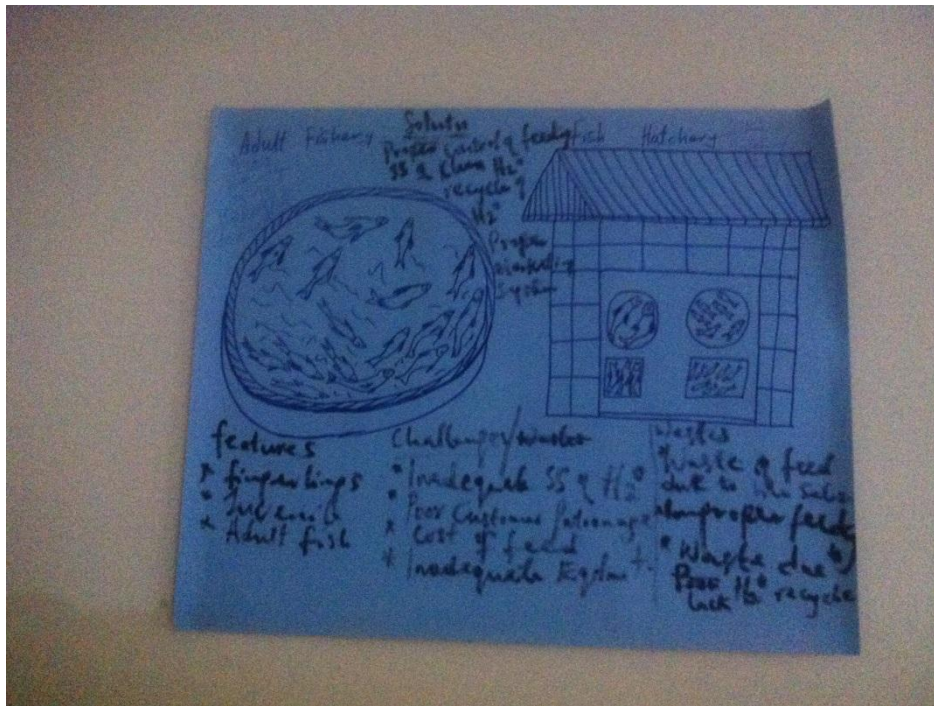
Figure 4.11: The rich pictures used at the workshop session on the Fishery.

The rich pictures attracted the participants, tapped their interest and encouraged them to contribute to discussion on the waste experienced in the Fishery section.

   Waste due to over feeding of live-stock:

As discussion continued, the participants explained that the live-stock, especially the fish in the ponds, do develop diseases if their feeding is not well controlled. They

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pointed out that over feeding live-stock would also lead to unnecessary wastage of input materials (live-stock feed, human energy and medication) which could have been avoided.

Similarly, they maintained that if feeding, is not regulated with the projected market forecast, there may be excess products for sale at a given time leading to issues such as over production and challenges of unsold products, which would attract additional cost to culture (i.e. feeding and medication), till when they are needed in the market.

 They also went on to cite instances such as the quantity of feed given to each pond must be made commensurate with the population of fish in the pond. They stated that there is a limit to the live-stock development process-fish, beyond which the fish would not add any further weight. They highlighted that when you have excess feed on the water in a fish pond, the water gets polluted easily, and that means impurity, which can facilitate the development of health challenges, such as the respiratory disease, if not changed.

 They noted that this would therefore require effective skills of the attendants to avoid over feeding which can lead to health problems, or underfeeding in which case, the fish may lose weight, which can affect their market values because they are sold to customers on per kilogram basis.

Waste due to Low turnover

They also cited cases of low customers' patronage which can also lead to waste due to the requirement for continuous feeding of unsold live-stock to keep them alive. They explained that in some cases, the price may not increase or may even drop, resulting to losses. They suggested the possibility of processing them via smoking into dried fish (which they claim have long shelf life), for customers to buy, instead of keeping them because this would make them consume more live-stock feed and medication, and that

would not free up the ponds for new batch development. They expressed the need to create further awareness of customers by the marketing team.

Table 4.11: Summary issues and suggestions on the Fishery department

Issue	Suggestions for improvement
Inadequate water supply	• Rework the abandoned water recycling machines with better materials, • Acquire the new fish farm that has higher water table to supply water
Unsold stock of fish kept in the pond	• Smoke all current old stock, • Improve on current marketing strategies to cope with the expanded capacity
Waste due to overfeeding	Regulate and monitor the feeding process to match with the population of fish in each pond.

Based on the above suggestions and comments of the participant the expected new process map for the Fishery was jointly produced by the researcher and the participants at the workshop .This is presented in the figure 4.12 below.
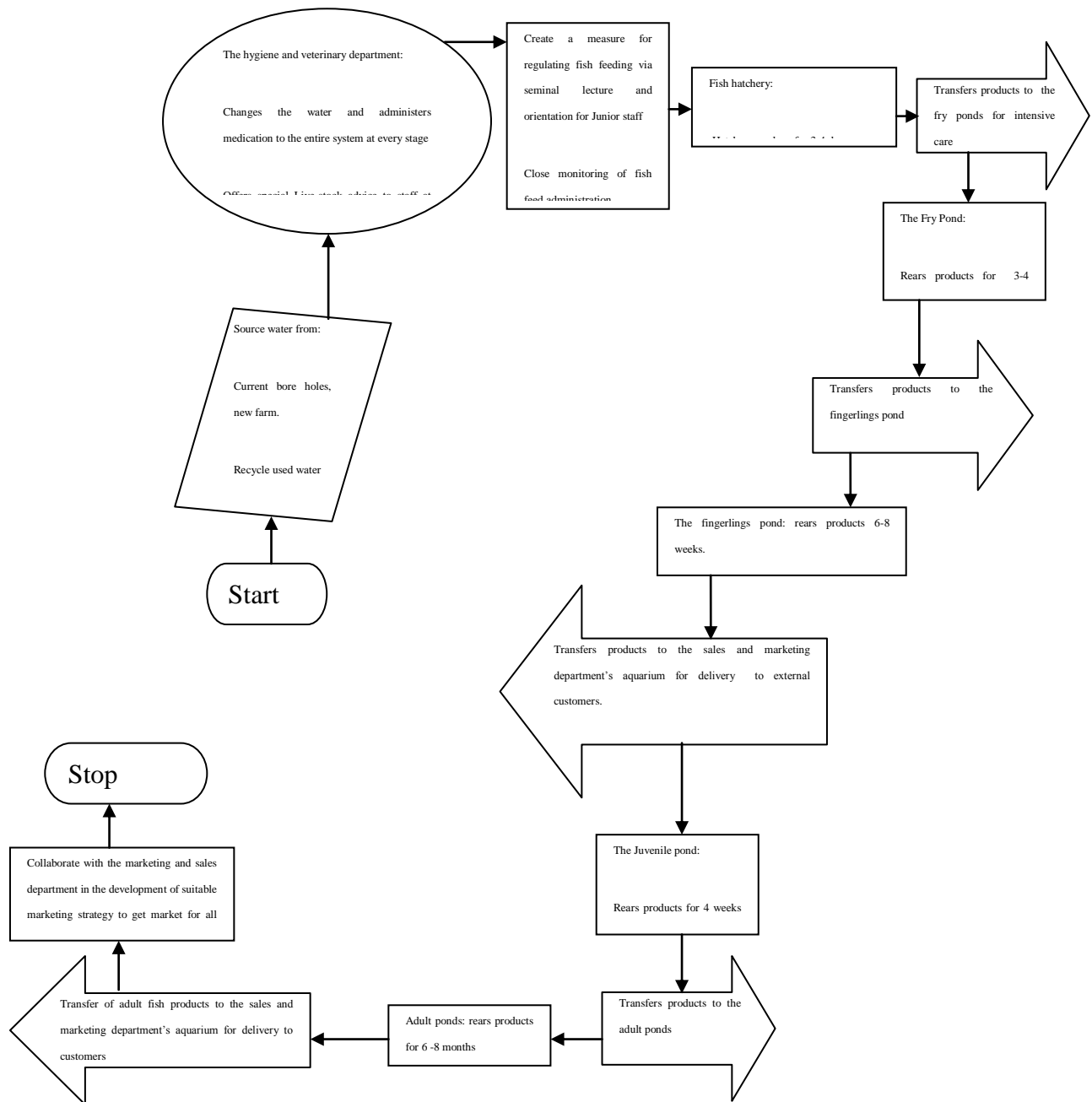
Figure 4.12: The new process map of the Fishery department.

4.8   The Sales and Marketing Department

From the initial interviews conducted with the manager and staff at the Sales and Marketing department, it was learnt that the department is responsible for marketing and

the sale of all products offered by the farm to its range of customers. This department is headed by a manager. All products from the production section of the farm (e.g. Eggs, Processed Chicken, live-stock feed, Day old Chicks, Cockerel and others), are transferred to this department for onward deliveries to customers who ordered them. All communication and relationship issues with the downstream customers are managed by this department on behalf of the organisation.

The important stakeholders of the Sales and Marketing department are the various departments in the production section, the department's manager and staff, the customers, the top management, the accounts and finance department.

The Sales and Marketing Manager and supervisors who responded to interviews also identified the different groups of customers maintained by the farm and how this shapes their relationships.

They classified their customer base into two forms for each of their current product lines. For instance, wholesale customers are those who buy up to 200 crates of eggs and above, while all others who buy less are regarded as retailers. Those who buy up to 50 kg and above of fish products are wholesale. The point of disagreement is that the organisation sells to the two groups at the same price. And sometimes, bulk buying customers who pay into the firm's account do not get their products delivered on time. Based on these interviews, the current activities of the Sales and Marketing department are presented in figure 4.13 below.
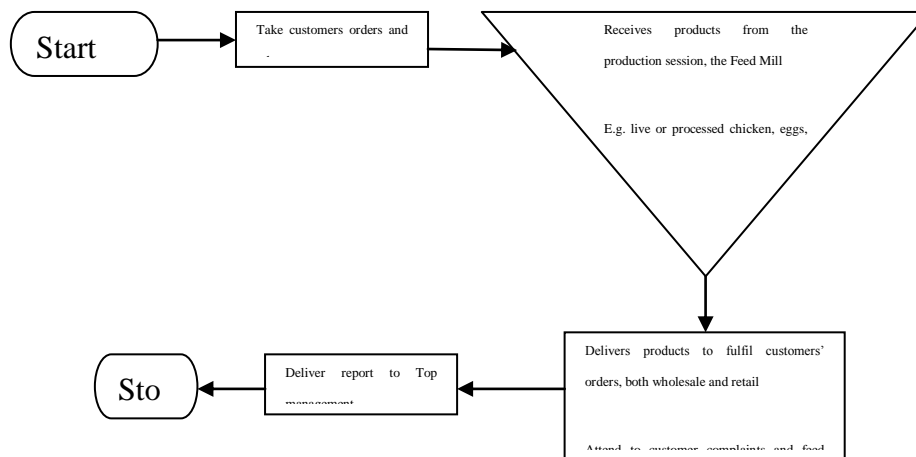
Figure 4.13: Current operational process of the Sales and Marketing department.

4.8.1   The main operational issues at the Sales and Marketing department

Major issues of concern to the sales and marketing department is security and power supply which were extensively discussed earlier on in this report. However, based on further interviews with these respondents, other specific challenges faced by the Sales and Marketing were identified and further enquiries necessitated the conduct of a workshop session to complement the interviews.

Inability to meet downstream customer demands:

Upon the disapproval from senior management, to run any workshop with the downstream customers due to their preference to deal with them on individual basis, personal interviews were organised with some customers. The essence of this was to identify the main issues that affect their relationships with Organisation A, as beneficiaries (customers in CATWOE), of the operational process of Organisation A.

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These interview sessions were based on duration of the relationship with the firm, the average quantity purchased at each transaction, and the willingness of the customers.

The interview responses showed that the majority of the firm's current customers are unhappy with certain requirements for transaction demanded by the Sales and Marketing department. While some of these customers praised the quality of the firm's range of products, especially table eggs which they claimed to be of higher quality, compared to those of their competitors, they decried the firm's failure to meet their products capacity demands.

Others complained of the rigours involved with the transaction method accepted by the farm, which requires them to pay into the firm's bank account. Some of them claimed that due to their low level of literacy, completing bank payment becomes a huge task. One interview respondent complained that:

> "Even after payment into the accounts, they ask you to come the next day or so but you come and find the products are not available for delivery. And they ask you to come again and all that! It is simply problematic at the moment" (A wholesale customer for eggs and processed chicken).

The Issue with sorting and packaging of products

They also complained of improper sorting and packaging of some of the products (eggs, processed chicken) for customers, especially the wholesale buyers, and suggested the need for Organisation A to pay due attention to the sorting of their products into the correct sizes because what they are currently doing is unacceptable.

These customers explained that some small egg sizes are sorted and packaged as large. In their claim, they say that this has slowed down the rate at which they are able to sell these products to their customers. They blamed this on the suspicion that the firm's

current production process needs a critical review in terms of man power skills required that can help develop further, on the current capacity and adequately address the issue of live-stock mortality which they claim may have affected the capacity adversely.

Other commentators spoke about the issue of product breakage (e.g. eggs, day old chicks, cockerel), which has led to the rigours of returns to the organisation, demanding replacement. They attributed this also to the packaging of these products which they said are inadequate.

On a scheduled interview with some staff at the Sales and Marketing department, respondents further explained that all products offered by the firm are currently sorted and packaged by the various departments at the production section (e.g. Layers, Hatchery), of the farm. They acknowledged the incidence of these products being wrongly packaged and some others were decayed (processed chicken) but they explained that it is the job of the producing department to pack the products accordingly, ours is to receive and distribute to the customers. A common challenge faced by majority customers maintained by the farm was 'price fixing' which they claim management does all alone without consulting them, who are the buyers.

> "They just impose it on us! They need to always let us know
>
> and at least allow us to plan towards it" (Customer).
>
> *Focus on retail customers instead of the wholesale*

Some customers also expressed their disagreement with the way the firm currently rations the distribution of their product to customers. They noted that due to the firm's diverted interest in meeting the demands of the low quantity-buying customers, instead of the wholesale buyers, the product quantity demands of the wholesale customers are always met half way in recent times due to this conflicting challenge, which they claim

is affecting their relationships both with the organisation and their own customers (customers to the wholesale customers).

The issues of religious sentiment in order fulfilment

Another key issue raised by some of these respondents during the interviews was the issue of religious sentiments in the release of products to some customers, which they say has eroded the fair treatment with which all the customers were treated at the earlier stages of their relationship with the organisation. While these customers suggested a total review of these issues, they emphasised on a reschedule of customers order management that can eliminate such breaches in the delivery of products paid for. They further suggested the need for the firm to stick with their current customer base since their capacity is yet to be able to match current customers' demands.

These issues raised by the customers were brought before the top management staff (The General Manager, The General Accountant and the Assistant General Manager), and the Sales and Marketing Manager in a different workshop session. Being owners (under CATWOE), in the sense that they can initiate changes, as well as actors who work with these customers, the session was meant to find out their views on these issues and how they can be resolved in their operational process.

The General Manager and other top management staff accepted the task to expand their current production capacity, to meet downstream customers' demands.

However, the Assistant General Manager responded differently to this assertion. He pointed out that from his personal observation; some of the products offered by the farm are of seasonal demand which requires adequate planning to ensure that the company will be able to sell all products at each period. He emphasised that without proper planning, the farm can end up in problematic situations of having unsold products.

These participants also maintained the stand of Organisation A on payment by bank deposit as the most suitable option due to security issues and prevention of fraud. They agreed to allow staff in the Sales and Marketing department to offer assistance to customers who may have difficulty in effecting bank payment for products for the less literate customers.

The top management (e.g. the General Manager) highlighted the plan to embark on free home delivery of products to the wholesale customers. They noted that such effort would help sustain their relationships as well as reduce incidences of product breakage in transit which they always had to replace. In their response to the complaint of improper sorting of their products, the Assistant General Manager assured that the managers in the affected production sections would be contacted for appropriate actions. He also suggested that the managers be interviewed if necessary.

Nevertheless, the participants rejected the suggestion of placing an embargo on acceptance of new customers, claiming that rotating customer services coupled with their intention to expand capacity would be able to match the challenge in the future. They say this would guarantee continuous turnover of their products and help absorb the pressure of customers having unsold products, which according to them can pose a huge threat because most the products, being 'consumables' have a short life span, coupled with the challenging situations of facilities in the farm such as the non-functional cold rooms and power supply issues. Consumable in this sense refers to products that have a short quality life span beyond which they cannot be consumed. Due to the length of time taken to complete the session, the workshop was brought to a close after about an hour and a half, and a new date was set for further deliberation on customer complaints issues.

The next session was a workshop organised to continue discussion on the issue of downstream customers' complaints. The focus on this workshop was product price which the interviewed customers complained that they do not receive information about. Among the invited attendees were top management staff including the General Accountant, the Assistant General Manager, the Administration Manager, the Sales and Marketing Manager.

The Administrative Manager however opted out of the session noting that his office does not do pricing of products. He noted:

"I have nothing to offer about pricing!" (Administrative

Manager).

During the workshop, the participants acknowledged the sensitivity of pricing of the products offered to the market. They recounted that Organisation A currently considers a lot of factors in their product pricing process which includes: a survey about the competitors' prices for the same products, the cost of production, and the wider market where they operate. The Marketing and Sales Manager recounted that product pricing, being an important part of the company's operations, took their concerns into account and would necessitate a consultation to address the issues.

"Even if you consult them further on this, they would always ask

for reduction in prices, and even if you reduce prices they would

still complain and ask for more. So I think we are currently in

order with the way we manage our customers' relationships"

(Marketing and Sales Manager).

The General Accountant, while complementing the earlier contributors to the discussion, however suggested that whenever product price changes are proposed, the customers should be pre-notified, at least in a telephone message or a call. He said this

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would give them the opportunity to prepare and also inform their customers, instead of the current sudden change approach practiced by the firm.

At the end of the session which lasted over an hour, the participants joined the researcher to produce a process map depicting a new sales and marketing activities which portrays the suggested improvement for the future, based on the various suggestions made in the data collection process. An improved version of this is presented in figure 4.14 below:

A separate round of personal interview sessions with the managers and supervisors from the Hatchery and Poultry section, meant to deliberate further on the issue of improper sorting and packaging of products raised by some customers earlier. One of the respondents (Supervisor at the Layers department), blamed the issue on the failure of the Sales and Marketing department to notify them in time, and promised to request for customers' feedback each time they deliver products to the Marketing and Sales department, to facilitate necessary amendments.

> "The Sales and Marketing department should have told us before now!" (Supervisor, Layers department).
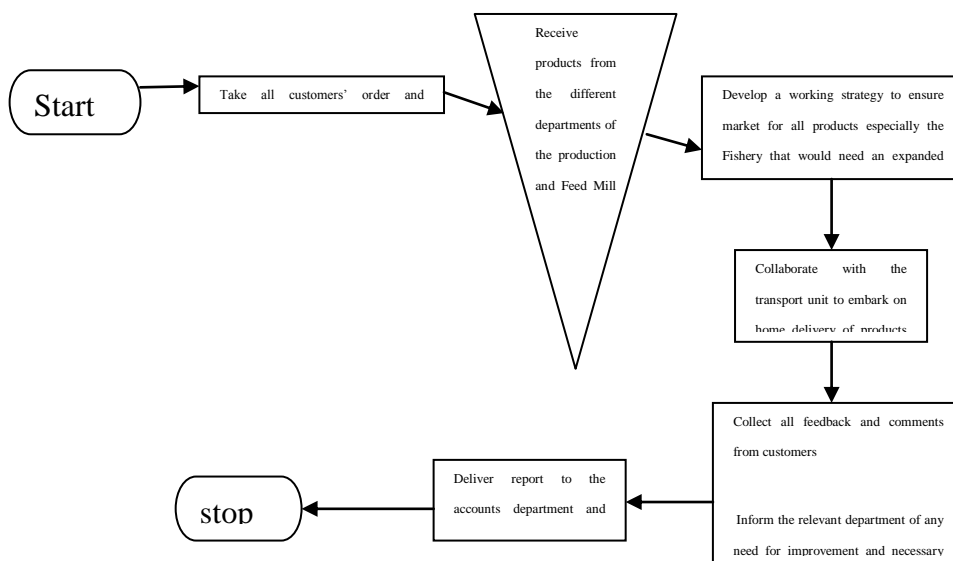
Figure 4.14: The new process map for the Sales and Marketing department.

The above presentation in figure 4.14, about possible changes for the future in the Sales and Marketing department was drawn based on the interactions, suggestions and comments of the participants.

4.9   Narrative of changes in Organisation A

This section includes further observation and some personal interviews conducted with the General Manager and other top management staff, including some relevant stake holders.   Also some changes based on emerging issues and the effects of the data collection process (intervention), at different points of the operation were identified.

It must be stated here that the changes were based on the pace scheduled by the top management of Organisation A.   As such, the changes documented here are the ones that happened during this research period, as some of the suggestions were subject to top management approval for implementation, which eventually, were done after the completion of this research process. However, all the decisions reached were recognised by the participants.

Details of these changes are presented in this section and captioned in two forms – general operational changes, those affecting the entire operational system, and departmental operational changes, which are those concerning individual departments in the operational system.

4.10   General operational changes in Organisation A

Addressing Security challenges:

The General Manager, while noting that the organisation could not stop the presence of public police patrol in the farm premises, further explained that the senior management has been able to establish a good rapport between the public police and the farm security staff. This meant that police patrol of the farm premises would continue. He noted that the police has agreed to offer security advice and sometimes organise interactive sessions anchored by some senior public police officers with the staff at the security department in an attempt to keep an update of security services in the farm.

Part of the new decision taken in respect of security in the farm is to employ a new batch of security personnel who are younger in age and have the ability to read and write effectively. The General Manager said that part of the new development in the entire operational system is the recruitment of female security personnel. This was put in place to match the cultural demand in the local area where Organisation A operates, which does not allow women to be searched by men. Other changes included a significant review on the work schedule time tables operated in the department.   He explained that this improvement was occasioned by the recruitment of new staff and training of existing staff in the department. The senior management has also approved the inclusion of off duty days for serving security staff of the organisation.

The Assistant General Manager in a related interview session also pointed to the decision of the Management to provide more security gadgets such as regulated flood lights for night watch around the premises of the organisation to further enhance security on life and property in the farm premises.

Improvement in the overall team practice and effective training and awareness for staff across levels of their operational structure

After the intervention (data collection process), it was observed that some internal organisation members (especially the middle managers, supervisors and even some junior staff in sections such as the Hatchery and Poultry), tended to act differently in their various duties, embracing team practice that seeks to jointly act towards achieving the overall organisational objectives, rather than the individualist approach which had been the case in the operational process.

From personal interviews with the Assistant General Manager and the General Manager, it was learnt that the organisation has resolved to listen and deliberate more on all operational issues and opinions in the weekly meetings. This was also extended in the form of training seminars for different junior staff groups, where relevant information are delivered to them.

> "We now have weekly meetings apart from the daily debriefings, where we discuss and find ways forward on bordering issues" (The Assistant General Manager).

However, the new General Manager on his part, explained that contrary to the earlier decision by his predecessor (e.g. involving the junior staff representative deliberations at general meetings), the involvement of the junior staff representation on general meetings has been abolished for an undisclosed reason. However further claims made by the General Manager showed that the decision was based on their assumption of the incompetence of these junior staff.

"The junior staff are now only allowed to speak with their immediate supervisors, who relay all relevant information via their reports to the management. This is to avoid unnecessary distractions, as the top management has opted to be closer to the daily operational process, through close supervision, making it easier for emerging issues to the recognised" (Assistant General Manager).

The Assistant General Manager noted that the entire approach is to adopt a joint approach to identifying and solving problems in their operations rather than let the individual display which he says could sometimes be misleading in their operational process.

"When things go wrong, everybody now bears the burden together instead of trading unnecessary blames and that promotes common thought among the staff." (Assistant General Manager).

However, a further range of interviews with some selected junior staff from the production section (e.g. Layers, Broilers, Abattoir and Brooding departments), revealed that management (both top and middle), tended to remain aggressive to the junior staff. These interviewees stated that a current wave of the effect of this leadership relationship with the junior staff has accounted for the mass turnover of junior staff from the employment of Organisation A in recent times.

"They are very hash, and simply oppressive! We want to give

our best but they (top management) seem not to have any real

regard for us" (a junior staff from the Feed Mill).

It was equally learnt from the comments of these junior staff respondents that the organisation has withdrawn an earlier decision to allow the shop floor staff in the production section (Hatchery and Poultry), to attend church services and resume 12.00 pm on Sundays. The new rule allows the staff to resume in the morning like other week days but finish 3.00pm on Sundays.

On witnessing the progress of these personal interviews with the junior staff on this topic, the new General Manager interrupted the process and asked for a total stoppage noting that the junior staff, lack the competence to give any substantial information about the operations of Organisation A.

"This is man is a mere junior in one of the departments, I think

genuine information should be sourced from the senior and

management staff" (the new General Manager).

But the researcher later explained reason for the interview session with junior staff to the General Manager, though he insisted on his refusal to allow the session to continue.

In an interview, the Assistant General Manager played down on the comments of these junior staff respondents, about staff turnover noting that it is a common practice in most organisations, that there is free entry and exit to the employment offer to staff in every organisation.   The Assistant General Manager cited personal reasons rather than management relationship with the junior staff as the main reason why staff resigned

from the employment of the organisation. He noted that some of them resigned after receiving their end of year bonuses from the organisation, which he thinks is unfair.

The Assistant General Manager also explained the position of the top management on the decision to reverse the earlier decision to allow the junior staff in the production section to resume work at 12.pm on Sundays. The Assistant General Manager stated that the practice was observed to have caused low live-stock productivity, in terms of eggs production (Layers), and other health challenges affecting the entire Poultry and hatchery operation, occasioned by the practice of skipping their care on Sunday mornings. This, the Assistant General Manager said mandated the change; but noted that the top management has approved closing time for these staff by 3.00pm on Sundays and a plan of action to ration the number of staff to be on duty on Sundays, which would ensure a rotational practice of staff duties on Sundays to be implemented.

The Assistant General Manager however acknowledged the possibility of aggressive leadership practice among some top management staff but noted that it is not a serious matter but such would need time to be fully phased out of their management structure.

> "Aggression or bureaucracy is an individual attribute of the concerned manager which is most likely a subset of his worldview; which would need time and learning to change".
> (Assistant General Manager).

Furthermore, it was learnt from interviews with some middle managers (e.g. Piggery, Brooding, and Broilers), that most operational decisions and initiatives come directly from the top management with minimal contributions from the junior staff and the

middle managers. This points out an impairment, causing delayed actions, as necessary authorisation are exclusively granted only by the top management.

It was also learnt from some middle managers (e.g. Broiler, Parent stock), and even some top management staff that this practice has led to some further issues such as authorisation and decisions on certain critical operational issues being taken by unsuitable personnel, who do not have the needed expertise to take such decisions.

> "Requests for materials and other needs must be made at the
> right time by the Manager while the approvals should as well
> be granted without delays if effectiveness must be achieved"
> (Manager at the Broiler department).

While acknowledging the positive changes in the Broilers department which includes low rate of live-stock mortality, the Manager in the Broiler department noted that corroborated the observation of other middle managers in the areas of the need for more man power in the junior staff category, water supply and electricity in the farm; noting that these were relevant to the quest to deliver on the newly secure contract by the organisation.

But the General Manager and the Assistant General Manager explained that this decision has been due to the experiences of fraudulent practices in the recent past, among organisation members, resulting in lack of trust by the top management and close monitoring of operational activities in the organisation.

Addressing the issue of general shortage of junior staff and training

The top management has approved the recruitment of a new batch of junior staff but with a minimum academic qualification of ordinary levels certificate. This decision was put in place to be able to meet emerging changes in their operational structure as well as the expansionary vision of the organisation. However, these are to be offered sufficient training to equip them with necessary awareness of the operational requirements in the various sections of the farm.

This became an organisation wide practice, with focus on both the shop floor staff and the middle managers. A contract for the training of these staff was awarded to a professional firm to offer the needed training to all the junior staff on different areas in their operations. This is meant to enhance their competence and flexibility to handle the tasks ahead, especially in the delivery on the new massive contract of supply of their products to their clients which is viewed to require special skills and abilities other than what the current staff possess.

> "No one among the junior staff would be asked to do anything without due information and assistance! We realise that this could make them become sufficiently aware of what is expected of them. We are now more conscious of our objectives in terms of effective value development, aided by the involvement of all staff at different levels" (the General Manager).

Changes in key managerial roles and positions:

Upon further observation on some important changes in the roles assumed by some senior management staff of Organisation A, leading to some disciplinary action such as

dismissal and demotion or change of roles. This resulted into a series of changes between the General Manager and other key staff a number of times while this research lasted. Some personal interviews were conducted with the new General Manager who made it known that some senior management staff were found fraudulent, while others were incompetent in their roles (e.g. abuse of position, theft, and breach of trust). Particularly, cases of compromise on the quality of input materials, for processing live-stock feed were reported, which resulted to some losses to the organisation.

From further investigations and findings, disciplinary actions ensued which led to the changes in the positions such as the resignation of the predecessor General Manager.

In a disagreement with the General Manager, the Assistant General Manager, who was not affected by the change wave tended not to be bordered by the changes in roles, noting that the contributions of the individual organisation members is simply what is important. He explained further that part of the reasons for the reshuffle was for productivity on the job. He cited an instance of waste (in stunted growth, fragile egg share, poor productivity in terms of fertile egg production at the Parent stock, mortality and other health challenges), incurred in the Poultry section which was traced to a wrong approach to live-stock feed formulation, which necessitated the transfer of a new middle manager with more experience to work with other relevant members of the organisation to address the challenge.

The Administrative Manager also support this argument noting that swapping position does not really matter but the individual's contribution towards the overall team effort is rather more important.

Addressing challenge of water supply:

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From observation, the issue of shortage in water supply in the farm was continuous as it was learnt that the top management abandoned the plan to revive the water recycling machine earlier installed for use.

In an Interview session with the Assistant General Manager, it was learnt that the cost of recycling water in the farm is outrageous and the report delivered by a team of experts consulted to review the project showed that the purported recycled water may not be suitable for live-stock farming purposes.

The Assistant General Manager rather explained the position of the top management on water supply to include sourcing water from the new fish farm (which is about 6km away). The farm also has a plan to embark on rain harvest, which involves gathering of water from rain fall during the raining season (a period when there is frequent rain fall), and storing in underground tanks. This farm has also acquired more sophisticated borehole equipment to provide adequate water supply in the farm. He expressed the hope that with these diversified approach on ground, water supply challenges would be addressed within the shortest time.

> "We are reworking our boreholes, fixing new machines to ensure free flow of water supply and hopefully there would be electricity power supply to facilitate the process for effective water inflow in the farm. This is coupled with many more storage systems (both overhead and underground tanks) to ensure availability of water. Also we apply necessary treatment to improve on the water quality and make them more useful to live-stock" (Assistant General Manager).

He further affirmed that the organisation has put a stop to sourcing water from any other external sources which he said could not be trusted for purity, as the firm strives to control health and mortality issues on live-stock in the farm.

Addressing the Challenge of live-stock waste Disposal and the biogas electricity project

The former General Manager, in an interview (after the main intervention process which involve several Lean and Systems workshops), noted that the organisation has approved a plan to install bio gas plant that would use its generated wet live-stock waste (which currently constitutes 75% of their total waste from the farm), to generate electricity. While he declined to offer further explanation on the project, he noted that an understanding has been reached with the government agency and the host community representatives (the concerned stakeholders), to develop this project within an agreed period of time.

He explained that the organisation has secured funds from various sources to embark on expansion of the production section, first to meet the downstream customers' demands and to generate more wet waste to meet the requirement for biogas.

However, in a later interview with the new Assistant General Manager, the farm has opted to focus on the new mega contract of supply of Broiler products which would start immediately. He explained that the proposed expansion of the Broilers department would not stop their intention to develop the biogas project which was earlier approved, but the live-stock waste from the proposed Broilers project would be the 'dried live-stock waste,' which the farm now uses as manure for their private input material farm in the northern part of the country.

The proposed expansion of the Layer section that would culminate in meeting the amount of wet waste needed for the biogas would need to wait for the future when the section would be expanded, noting that the organisation would now use this time to embark on further details about the viability of the project in relation to the electricity power supply needed in the organisation.

Currently, the organisation has hired a land fill far away from the farm for dumping its generated wet waste as well as constructed underground tanks in another isolated location to also use as dump site for its generated dried waste.

> "We direct the current waste to an underground tank to reduce
>
> the offensive odour which the community complains about for
>
> the now" (Assistant General Manager).

This points to the fact that the farm would continue to rely on independent power supply (private power generators), to supplement their operational power supply needs.

On meeting some host community representative on this new development, they highlighted that they have reached a decision with the company to address the issue of waste disposal management permanently.

> "We appreciate their stay in our community but we cannot allow
>
> pollution any day from any establishment. All we have said is to allow
>
> them a period of two years since they made us to understand that the
>
> proposed project would take some time to complete but after then, we
>
> may explore all other available means to press our demands home"
>
> (Secretary to the host community representative committee).

4.11 Emerging Departmental Changes in Organisation A

Changes in the Hatchery and Poultry section

According to the General Manager, the organisation has put a new structure in place to ensure live-stock mortality is controlled. He explained that this was necessary to set the stage for continuous expansion which the organisation has maintained as part of their primary vision.

Among the benefits accruable to this, are the production of sustained high quality products for the market (e.g. Broilers, eggs, cockerel and live-stock feed), and the control of life stock mortality. He explained further that while this new approach to handling mortality is now widely operated, other measures such as junior staff orientation and seminar lectures on major changes to ensure effective learning that inform compliance were now being implemented across the operational system.

He recounted that the second lap of this effort is to initiate further improvement on their current bio security practice across the Hatchery and Poultry section. He hinted on the new plan to restrict visitors from the production environment for hygiene reasons and the practice of new effective hygiene awareness seminars for all staff and supervisors in the operational process (especially in the production section), to ensure an all-round effective hygiene practice that meets the standards set by the regulatory authority.

Changes at the Feed Mill:

Part of the systemic changes that followed this intervention is the focus of management on the operations of the Feed Mill, with the aim to address identified issues such as

machine break down, and staff productivity in terms of effective processing of live-stock feed for the farm and external customers.

In an interview with the Manager at the Feed Mill, it was learnt that in addition to the current maintenance structure of the farm, the top management has secured a formal maintenance contract with an out source company to take charge of the repairs of their equipment at the Feed Mill to ensure a more improved maintenance culture and also advise them on how to sustain continues operations of the Feed Mill for the production of live-stock feed in the farm.

He explained further that the top management has also directed the initiation of a compulsory training program for all staff posted to the department, to ensure proper grooming on handling the processing of live-stock feed that meet the expected quality standard demands for rearing live-stock , both in the farm and for external customers.

> "...with the training for our junior staff working at the Feed Mill, which is the first of its kind in the farm, and the improved maintenance practice for our equipment. Knowing fully well that the Feed Mill stands as the hub of our operations, I can tell you that our customers stand a chance of getting no disappointment from us" (Manager at the Feed Mill).

In a related interview with a senior staff member at the logistics unit, he noted that the new approach would ensure maintenance with high quality parts since the contracted firm are a multinational company with a high reputation. He however said that the cost could be incomparably higher than what used to be the budget for machine maintenance in Organisation A.

The General Manager also explained further that part of the new changes is the mandate to carry out laboratory tests on all input materials delivered by suppliers for milling live-stock feed, used in the production section of the farm and for external customers' orders. He explained that this came against the need to address mortality and quality offer to the market via laboratory test on all input materials.

He noted that this new development would go a long way to help avert the occurrence of losses due to mortality, traceable to the issues relating to poor quality input materials in their operations.

Addressing the issue of delays in the arrival of input materials:

The General Manager noted that Organisation A has certified the farm project to go ahead on full scale, noting that a contract has been awarded for the construction of a massive grain storage facility (silo), as well as expansion of the farm size. This is to be able to provide input materials for the feed and help address the challenge of scarcity and quality. He highlighted the company's vision for expansion as the main reason for this decision, noting that only a back-up input materials source, such as the new farm project could stand a chance of guaranteeing success in the future.

Still on the issue of delays in the delivery of input materials to the Feed Mill, the General Manager explained that the firm has two optional plans to either embark on a formal contractual deal with an organised transport firm or acquire a fleet of heavy duty vehicles to convey these products to the farm.

He also cited benefit in terms of reduction in the frequency of 'down time' at the Feed Mill which had been of concern to the top management due to the challenge of meeting

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external customers' orders for live-stock feed. Down time is the time at which the Feed Mill does not work mostly due to machine break down or shortage of input materials for milling.

> "We have a formidable logistic system now that can handle the issue of delays in inventory deliveries" (General Manager).

A later observation and interviews with the top management staff (e.g. the Assistant General Manager, the Administrative Manager), the firm preferred to acquire new fleet of vehicles to effectively address the issue of delays and breaches in the delivery of input materials. These have since been put to use which has aided the free flow of input materials need in the operational system.

As part of the new measures to ensure consistency in the delivery of input materials, the General Manager affirmed that all unauthorised usage of the vehicles by staff is strictly prohibited. He explained that this became necessary to avoid transportation breaches due vehicle breakdowns, which could impair the intended objective of free flow transportation of input materials for the operations.

The General Manager also explained that the fear for communal unrest in the northern part of the country where the farm is located may not be an issue since the firm does not have any administrative office there and that the bulk of the labourers that were currently used were hired on a daily basis.

> "We would not have any problem with communal clashes! Majority of our staff there at the farm are casuals, while the few such as machine operators and security staff are stationed in the

farm premises and not in the urban areas. So we are far from the

urban areas where communal unrest happens" (General Manager).

He however explained that the farm is firm on its decision to keep buying from selected input materials suppliers whose product supply pass their set laboratory test for quality.

A further personal interview with the General Accountant showed that the Feed Mill has an unused capacity which put the firm at an advantage to be able to absorb the pressure that may emerge as the plan to expand production capacity in the organisation. He explained that the current capacity usage of the machines in the Feed Mill is just a little above the half of its full capacity and forecasts have shown that the unused capacity would be enough to support an effective expansion.

Changes in the Fishery section

In an interview with the Assistant General Manager, He noted that the new Fishery has been cleaned up and stocked with a new batch of Fish. The Assistant General Manager pointed out that the Fishery could not continue to produce infant fish for customers (e.g. Fingerlings or Juvenile, for other farmers). The Assistant General Manager said this was due to the absence of a competent manager to head the section after the resignation of the former manager. An approval for the employment of a new manager for the section has been granted. He hoped that the fish would find positive response from the market especially with the improvement on the marketing strategy of the firm.

Finally, the Assistant General Manager explained that the earlier suggestion for the use of eggs shell from the hatchery and left over bones from dead live-stock fed to the Fishery, for processing live-stock feed supplement at the Piggery was still in progress as

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the need for proper certification and advice were necessary to avoid health challenges on live-stock.

Interview with a supervisor in the Fishery section revealed that the Fishery had commenced the usage of maggot to complement live-stock feed, noting the Veterinary and hygiene staff gave full support and Supervision to the process.

But emerging reports from interviews with the middle manager at the Layers department and the supervisor at the Fishery, later showed that the farm had stopped the usage of maggot to feed the fish due to disappointing effects on the fish, culminating in stunted growth and an outbreak of disease in the Fishery which was traceable to the use of maggot. This stoppage was interpreted as a significant waste by the top management as the growth of the fish could no longer match the expectation of the downstream customers. And it was also meant to avert possible sanction from the regulatory government agency which mandates farms to produce and sell only healthy products.

Changes in the Marketing and Sales

A new decision to improve on the existing sales and marketing strategy was developed. This was aimed to widen the market share of their range of products to match their plans for increase in production capacity. The Sales and Marketing Manager, explained that part of the new development in the farm is the commencement of the usage of different awareness media (radio, TV jingles), to advertise their range of products, especially the new ones that are emerging in their offer to the market. He explained that via this effort, products such as smoked fish which the company has as a new product line, could gain patronage in the market.

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The Marketing and Sales Manager explained further that the department works together with the transport and logistics unit, and commenced daily delivery of products to their whole sale customers which he said has yielded a significant reduction in the cases of products' breakage in transit.

> "We are now doing really well due to the new marketing strategy which includes massive advertising and other measures. We now have customers patronising our products from far distances, especially the Day old chicks, and Eggs" (Marketing and Sales Manager).

The Marketing and Sales Manager noted that the enlarged batch of fish expected to be ready for sales shortly tend to pose some challenge in ensuring the timely turning over of the stock and avoidance of past losses experienced in the Fishery due to unsold stock in the ponds.

More so, the organisation has reached an agreement with their wholesale customer to obtain confirmation from the department before effecting payment for products at the bank. This effort was meant to ease of the pressure of meeting their quantity requirements with their current capacity.

4.12   Summary

This chapter provided a detailed report of the implementation of Lean and Systems tools in the intervention process, in Organisation A, involving identified stakeholders. It applied data collection methods in the application of these tools on complementary basis, resulting in the detailed report in this chapter. The next chapter presents a critical

evaluation of the various data collection methods and tools applied in the research based

on the responses of the participants in the research process.

5   Chapter Five: Critical Evaluation of Intervention in Organisation A

5.1   Introduction

This chapter presents an evaluation of the use of Lean and Systems tools in Organisation A. It focuses on the advantages and the challenges associated with the uses and combination of Lean and Systems tools that were applied during the research process. The evaluation was based on the views and opinions of the stakeholders who participated in the research process and the researcher's reflection on the research process. While evaluation questionnaires were distributed (see, to appendix vi,vii), among the literate participants (those who can read and write), evaluation discussion were held (in the form of interviews), with some participants who are less literate, and who consented to air their opinions on the strengths and weaknesses of the research process as well as offer suggestions for future improvements.

The structure of the chapter is as follows: section 5.2 presents the modality for the selection of evaluation methods applied in this work. Section 5.3 presents details on the adopted evaluation frame work which underpins the evaluation process, setting the purpose, context and methods applied in this research process.   It explains evaluation of the combination of Lean and Systems tools in this research process. This is followed by evaluation of the different data collection methods applied in the implementation of the different Lean and Systems tools used in the entire research process. 5.4 presents a summary of the chapter.

5.2   Evaluation of the Lean and Systems tools applied in Organisation A

This section focuses on the evaluation of the combination of Lean and Systems tools applied in this research process. It focuses on the effects of such combination on the

context of this research, the involvement of affected stakeholders, as well as the aim of identifying and addressing operational issues in Organisation A.

Most authors in Lean and Systems literature (e.g. Hines and Rich, 1997; Hines et al, 1998; Midgley 2000; Jackson 2000; 2003 Gregory, 2007) have applied different approaches to research processes, in identifying and addressing research issues in different contexts. However, an identical factor underlying their interventions has been the exclusiveness that informed their research projects, as dictated by either the range of methods applied or the context in which they were applied; to either approach their research wholly 'Lean' or 'Systems' rather than having a combination.

Social scientists have supported the use of questionnaire in evaluation process, noting that it provides valuable evaluation data at the convenience of the respondents. Midgley et al (2013) applied the use of structured evaluation questionnaire, covering the streamlined areas of focus such as: the set purpose, the methods used, the context and the process adopted in an intervention[20].   However, critics of evaluation questionnaire approach challenge the potency of its streamlined answers that may not allow the flexibility to match the detailed interpretations of the respondents that may not follow a set trend portrayed in the questionnaire design (see, Eden, 1995; Rouwette et al, 2009).

This research would focus on evaluating the methodology applied in the research intervention instead of outright impacts or immediate change effects on the operational system of Organisation A. This is due to the complexities involved in arriving at a reliable judgement on the effects of the research process on the operation of

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[20] (Refer to figure 3.1 in chapter three for an evaluation model adapted from Midgley et al, 2013).

Organisation A, because of emerging issues in the research process and the time frame set for the completion of this work, which does not match with the full changes and impact of the research process on their operation (see, Checkland, 1985; Midgley, 2000).

From Chapter 4, it was observed that a significant amount of effects (changes) would take place in the future of the operational system of Organisation A. This affirms the findings, which Lean and Systems would need time to settle in the operational process of Organisation A.

Different worldviews and interests held by participating stakeholders of the operational process could potentially pose a difficulty to a consensus evaluation. Moreover, it was observed at the end of the data collection process that the top management of Organisation A would prefer to continue working with the suggestions on incremental basis (i.e. in accordance with the plan and available resources), rather than passing instant judgement or share opinions on the performance of the models applied in this research process. For example, while both the top management and the host community representatives finally agreed on the need to address the waste disposal management challenge, there became a breach to its immediate implementation due to the higher volume of wet live-stock waste required for the implementation of suggested solution (biogas electricity) which posed delay to achieving permanent solution. It also affirms the suggestion that evaluation would need to be aligned with the surrounding contextual issues such as resource availability (see, Pinzon and Midgley, 2000).

The observations in Organisation A showed that as with other conventional organisations, resource availability determines the pace at which a suggested change can

be implemented (i.e. how much the organisation has and is willing to commit to implement suggested changes). This is apparently due to the level of resource availability and the perception of the top management about proposed change and its impacts on their operational process. And it goes on to affect the evaluation of the effects of such changes in an operational process. Another issue here is the determining force such as government sanction. In Organisation A, for instance, the concerned government agency had a different view to their operational system in line with achieving set health and safety standards and the production of healthy products for the customers[21]. This was backed up with threats of sanctions by the government which tended to have compelled the top management to take swift action in the implementation of necessary changes suggested. These issues affected the evaluation process and made the whole process become more complex as these changes tended to affect the evaluation judgements on the methods applied by the stakeholders.

5.3   The application of the various Lean and Systems tools in Organisation A.

This section focuses on evaluating the effects of the different methods of Lean and Systems tools used in the research process. It aims to highlight the areas of strength as well as weaknesses in their application in this research context.

5.3.1   Personal Interviews

In this section, it is argued that the use of personal interview method was suitable for the research process. It was applied to facilitate the take-off of the research process; enabling the use of vita Lean and Systems tools applied in this work (e.g. boundary

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[21] Refer to the session 4.5.1 in chapter 4, for details about government agency sanctions

critic, value stream mapping). Personal interviews lent support to adequate ethical practice in the research process, in accordance with the participants' wish for confidentiality, which was achieved via the use of personal interviews as an alternative to other methods. Evaluation details on the use of this method are presented in this section, based on the questionnaire feedback and personal observation.

Midgley et al (2013) note that the use of different methods would help the intervener to explore the different perspectives that underlined a research process. Particularly, personal interviews were used as alternatives to workshops and personal observation at some point in the intervention process. It was also widely applied as a pre-workshop data collection method, which set the stage for gathering sensitive data from respondents who might want privacy, due to certain boundary issues and also to address time constraint. This was due to the fact that majority of the data collected were done during work hours in Organisation A. This meant that the interviews were also a useful method for data collection, especially when the time was not there for other members to converge for a workshop session.

An evaluation questionnaire respondent said that:

> "The use of personal interviews gave a further opportunity to the respondents to say what was in their minds" (Questionnaire respondent).

However he noted that such personal interviews were not able to reach all the participants that could have been willing due to the time and duty constraints of Organisation A.

Personal interviews at the early stage of the intervention were useful in depicting and understanding *Value Stream Mapping* (VSM) and process maps, and subsequently to understand the various functions that form the entire operational system of Organisation A. This was achieved via personal interviews with key organisation members who gave accounts of the functions and connections of the different parts of the system.

"It presented the opportunity to brain storm, develop ideas and suggestions on how to improve our operations" (Questionnaire respondent).

"It created a medium of respect for everyone's' view about the organisational system" (Questionnaire respondent).

5.3.2 Value Stream Mapping:

The application of VSM was useful in the implementation of Lean and Systems tools in this research. It gave the research data collection process an underlying systemic approach to identify and address the issues within the operational system of Organisation A. It was supportive of the intended collaboration among participants from different sections of the organisation. Their understanding of the VSM later helped in organising process improvement activities for each of the sections operated by Organisation A. It helped participants to participate actively in the various sessions. They were able to relate the impacts of suggested decisions on the different functioning parts that form the entire operational process of the organisation. This tool was however met with a challenge as the participants were sometimes not allowed to comment on issues that were concerned different departments due to top management

preferences. Although this challenge was later resolved via the use of alternative data collection methods (e.g. personal interviews instead of Lean and Systems Workshop).

For instance, during a Lean and Systems Workshop session at the Feed Mill in Organisation A, the issue of delay in the arrival of input materials was raised by participants and they explained that such has caused certain effects such as live-stock mortality due to malnutrition, but they declined to comment further on the issue of mortality. They rather asked the researcher to contact the relevant department concerned as it was against the code of operation to comment on issues that were not directly linked to their department.

5.3.3 Boundary Critique

Evaluation on boundary critique was not conducted through the questionnaire feedback from participants, but it was based on reflection and observations during the research process. In particular, the researcher observed that certain factors were considered in setting boundaries at each stage of the research process. These include: purpose, the level of understanding of the selected participants on the main reasons for the use of boundaries at each stage of the research process. Factors like the participants' status (e.g. positions, the stake with Organisation A), can influence their willingness to participate. Interest; whether the selected participants' are actually interested in the issues identified? Time; whether the participants actually have time to participate at a given stage of the research process? CATWOE, whether the selected participants were actually affected by the issues identified, whether they could be identified under CATWOE? Compatibility, whether the selected participants' share similar view about

the issue of interest (e.g. do they all see it as a challenge to be addressed or something else)?

Systems thinkers (e.g. Midgley, 1998; 2000; Midgley et al, 1998; Cordoba and Midgley, 2006), have proposed the use of boundary critique, emphasising on a two way approach to setting boundaries – primary and secondary boundaries, covering sacred and profane issues. They suggest that the preference of the agents would determine which ones to apply in an intervention. Midgley's suggestion of the use of primary and secondary boundaries have been widely recognised in literature, especially in the Western part of the world, where the vita constraints (e.g. low educational status), pose no significant challenges (see, Midgley et al, 1998; Midgley and Ochoa-Arias, 2004; Cordoba and Midgley, 2006).

However, this approach tended to require further modifications in this work, due to difference in backgrounds and other contextual issues (e.g. a developing economy obsessed with the challenge of basic facilities, less literate participants who might not be able to interpret primary and secondary boundaries). Else, the intervention could breach and make the work become expert driven (Midgley, 2000), and void of a participatory concept, that could reflect the interest of the participants.

As a result, the use of simple common ground suggested by Beers et al (2006) was adopted. Common ground applied in this research involved the adoption of a simple agreement on the adoption of an approach/es by the participating stakeholders at each stage of the research process. It formed an easier way of finding a common ground for participating in an intervention. This was to enhance better participation in the research

process, especially for the less literate workers (e.g. junior staff). These boundary

setting factors are summarised in figure 5.1 below.
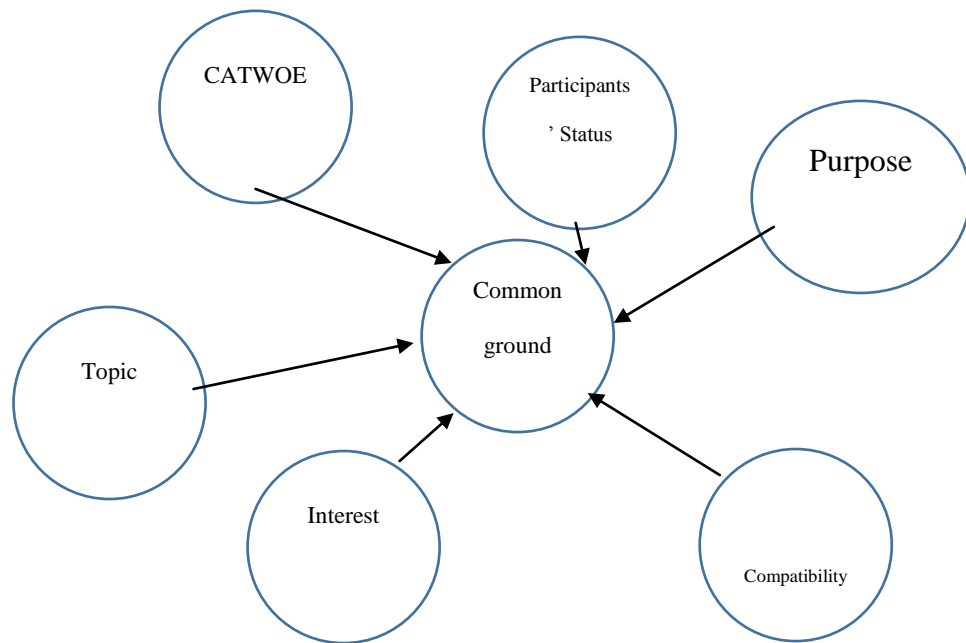
Figure 5.1: Factors determining set boundaries in the research process.

The set boundaries were subject to changes in these factors and such changes could also

demand further changes in the data collection methods applied at each stage of the

intervention. For instance, in the discussion with the host community representatives on

pollutant smell and reckless dumping of live-stock dung in the locality, the host

communities representatives, who were originally customers, benefiting from the

operations of Organisation A, assumed owners status (those who could halt the

company's operations), while Organisation A became 'actors' those who need to act to

change the situation. Due to these changes under CATWOE, the host communities'

representatives declined invitation to attend a workshop with the host community on the

issues but planning a violent protest instead, if Organisation A does not want to address

the issue. Changes like this, led to either changes in set boundaries or setting of new

ones.

This observation points to the fact that the effectiveness of set boundaries in an

intervention would depend on the acceptance and cooperation of the participants who

set and apply the boundaries in an intervention. Such offered an easy ground to adjust

and redefine common ground for the discussion to continue or reframing of the topic of

discussion.

The joint consultation with the stakeholders facilitated the setting and utilisation of

boundaries in the research process. Other factors influencing set boundaries are the

purpose of the discussion, the participant's interest and status, and the willingness to

participate at each stage of the research process. While all the factors highlighted in

figure 5.1 were considered, the participants' interest and the purpose of participation

were the most influencing in boundary setting the research process. It could be argued

that there cannot be a permanent boundary in a complex intervention; rather the

interveners would need to accept the responsibility to adjust or reset boundaries based

on the impact of the influencing factors. This is in tandem with Cilliers,(2005)

Midgley et al, (2007); Lee (2007); Midgley et al, (2013), who emphasise on purpose as

a key driver to an intervention. However an ambiguously set purpose could pose a

challenge to free participation. For example, certain participants were observed to

decline comments on certain operational issues due to the lack of knowledge of what

could emerge from their contributions. It therefore means that part of what makes a set

boundary work out in an intervention is the readiness to adjust set boundaries based on the emerging issues (Midgley, 2000).

5.3.4 CATWOE:

While many authors (e.g. Freeman 1984; 1994; Donaldson and Preston, 1995; Jones and Wicks, 1999:p209), have described whom a stakeholder is, this work went further to apply CATWOE as a base to ensure the involvement of participants who are genuinely affected at each stage of the research process. The application of CATWOE was useful to the data collection process.   It was particularly supportive in completing the setting of boundaries and grouping of participants in the data collection from different stakeholders identified.

For instance, while discussing with the host community representatives on the relationship with the organisation on issues such as the possibility of sourcing input materials from within the environment. CATWOE was used via some initial personal interviews to set boundaries for consultation and the top management was said to be the customers (i.e. those to benefit from the process), the host community farmers were said to be owners (those who can stop or facilitate the process). However, as proceedings unfolded and decisions made, the tides turned and the top management assumed the ownership title as they refused the offer by the host community owing to lack of trust. However, this turn on CATWOE was based on the change in the trend of discussion, affecting the participants' interest and not because of emerging conflicts or any other political sentiments.

 As earlier discussed, it was also observed that as issues were discussed, sometimes a participant group could assume more than one title on the CATWOE arrangement. For

instance, the host community farmers and the top management were also the 'actors' (i.e. those who could act to make it work out), in the discussion on input materials supply from the host community (see details on the chapter on findings). These changes mainly affected the data collection approach at different stages of the research (e.g. having to do interviews, instead of workshop). For example, junior participants at different stages may need further assurance of their confidentiality to participate in the research process, otherwise they may lose interest in the issues being discussed due to the possibility of being sanctioned.

While the interviews could offer a significant forum for the identification of main research issues in the operational systems of Organisation A, and served as a pointer to locating the main concerned stakeholders to identified issues, its approach in the intervention could not provide for adequate deliberation among members on identified issues for the development of a consensus solution to identified issues. This gave rise to the use of Lean and Systems workshop sessions discussed in the next section. Sometimes, due to factors such as low educational status of the respondents (especially the junior staff), they tended to keep going out of the context of the questions asked in the interview process.

Similarly, it was observed that due to time constraints some participants could also not be reached which meant that a significant data source was unharnessed. However, other data collection methods (e.g. Lean and Systems workshops) were used as an alternative.

Finally, due to the changes in top leadership positions (e.g. having a new General Manager), this particular method was faced with a stiff challenge as the manager restrained all the staff from commenting about the organisation without permission.

This meant that the consent of the top management was made a requirement for having interviews, especially with the junior staff. The new General Manager interjected an interview section with a junior staff attached to the Feed Mill saying:

*"*This man you are interviewing does not know much about our operations; he is just a junior staff and we will not allow that. You can ask any of us instead, if you want information" (the General Manager).

The restriction was later reversed after a further explanation to the new GM, who claimed that he was expecting the respondent junior staff to get on to their duty for day, though he acknowledged the importance of the research process in the farm.

5.3.5 Lean and Systems Workshop sessions

Workshop was used to deliberate on several issues of interest in the operational process of Organisation A. This involved the converging of affected stakeholders. It offered the opportunity for participants to share their opinions and raise bordering issues about the topics being discussed at each session. The workshops, according to the evaluation questionnaire respondent, served as a means of addressing the identified issues without undue exaggerations and accord due recognition to the operational interest of both the organisation and the external stakeholders concerned.

The workshop was a balanced session that considered the interest of concerned stakeholders.

"Attendance was not limited by age or tribe" (Questionnaire respondent).

"It harnessed the interest of Organisation A in developing the existing relationships between the organisation and the affected stakeholders; creating a forum for debating on current issues and making participatory effort to improvements" (Questionnaire respondent).

Although the workshop was designed to offer free opportunity for participation and withdrawer to participants, some participants (especially junior staff), expressed the fear of being sanctioned by their bosses in attendance during some workshop session. This led to their decline at some points during workshops, to making some significant comments and contribution during discussion. For instance, during a Lean and Systems workshop session involving junior staff, the presence of some middle managers who had the intention to participate in the session resulted to an all-round silence by the participating junior staff, who led the researcher to excuse the volunteer middle managers for the session to continue, though the topic of discussion was a general one about the operational process of the organisation.

There were occasions of domineering the attitude of some participants and sometimes fear of the superior among participants during workshop. While this issue was addressed with the use of alternative data collection methods (e.g. personal interviews and observation), as outlined in research methodology, it affected the data collection methods, and as such slowed down the pace and also denied the opportunity for contributions by other participants.

> For instance, "I would have asked this at the meeting but for
> the presence of our boss who supported the idea before any
> other contributor to the discussion. As a subordinate to him

(the Assistant General Manager), I did not want to sound challenging to him on his comments…" (Questionnaire respondent).

While some evaluation questionnaire respondents (e.g. the host community farmers, the middle managers and supervisors), observed that the workshop sessions offered the participants the opportunity to share their opinions without tension, a participant commented that some of the workshop tended to swerve into deliberating on trivial matters, which they noted prolonged the time spent on some of the sessions.

Another respondent observed that the workshop sessions were not quite explicit in discussing issues in quantitative terms that he said could have offered more explanations in numerical terms.

Another respondent noted that the workshop, though useful in addressing its set objectives, especially the ones with local community farmers could have done better with a larger number of participants who could express their opinions on issues discussed. These comments and other observations about the research process therefore affirm the argument that the use of complementary data collection approach which permitted the use of other methods (e.g. Personal interviews), was relevant to the achievement of the set research purpose of the intervention process.

5.3.6   Rich Pictures:

The use of rich pictures were applied at the workshop sessions. While these were helpful in expressing the problem situations and stimulation of participants' interest, it was however observed to be uninteresting to the participants at the initial stage. This

was partly due to the intention of the participants to keep with time and their perceptions of the fact that they already have details about the background of the topic being discussed. They felt that it could be time consuming, as they strove to keep up with their duty schedules.

The experience of the use of rich picture in this intervention draws on systems authors such as Midgley (2000); Bell and Morse (2013), who engaged the participants in their research to do the drawing of rich pictures. However, during the Lean Systems workshop in Organisation A, participants collaborated with the researcher to draw some of the rich pictures depicting the situations and decisions made during discussions. Some of the rich pictures used were later reworked by an expert artist, under the supervision of the researcher, for further use in subsequent workshop sessions during the intervention. These were based on the responses to the initial interviews conducted at each stage of the intervention process.

For instance, at different occasions, the issues surfaced through boundary critique interviews were combined into rich pictures, which were used in framing the empirical research. These rich pictures were used to boost understanding and harness the interest of the participants (e.g. Horan, 2000; Midgley, 2000; Bell and Morse, 2013). This readily aligns with the observation of Checkland and Scholes (1999), that the usage of systems methods and ideas, are simply anchored on the subjective acceptance and willingness of the participants at every stage in an intervention.

"The rich pictures really focused on our operational process and encouraged learning among participants on modern approaches to running an operational system" (A questionnaire respondent).

The application of these rich pictures was however kept in line with the caution of Midgley and Ochaoa-Arias (2004), who suggest that rich pictures, drawn by an outsider (apart from the participants), should be kept simple in order to make the intended meaning clear to the participants in an intervention. At some point, the use of rich pictures was rejected by the participants for time constraint. For example during the workshop sessions on waste identification at the Feed Mill, and General security issues, the use of rich pictures was withdrawn as participants preferred to contribute to discussion based on their experiences.

Apart from the fact that it helped in both the identification and addressing organisational and stakeholders' issues, as noted by the questionnaire respondents, it also served as a means of generating further issues of interest and opened up an easier means of addressing them through further deliberations.

Midgley (1992; 2000) note that the generation of further issues of interest from an existing relationships between parties, could either be 'sacred' (i.e. those attributes treasured by the stakeholders in their relationship with an operational process), or 'profane' (i.e. those attribute they detest in their relationship with an operational process). He notes that sacred or profane attributes could influence the sustenance of the existing relationship boundaries or facilitate the formation of a new one, based on emerging issues from their earlier relationships. In line with this, some workshop sessions were either terminated and rescheduled for future discussion or a new boundary for participation were formed to enable productive deliberation with the right stakeholders during the data collection process.

5.4 Critical reflection on research methodology in respect to the implementation of Lean and Systems tools

This section presents a critical reflection on the methodology applied in this work. It argues that the uses of Lean and Systems tools have proven to be suitable for the research process, while involving different stakeholders. As Hines et al (2004) note, many literature tend to view Lean thinking not just in isolation and mainly with narrow stakeholders' involvement, which is mostly implemented in two forms: shop floor and the strategic levels (also see, Jorgensen and Emmit, 2009; Taylor and Taylor, 2009).

The application of Lean and Systems in this work has gone beyond operational functions (giving due consideration to the effects on other parts of the operational systems), regarding the implementation of Lean to include a wider important stakeholders' participation in the intervention. While this lent support to a systems consideration via stakeholders' participation, it offered more resilient approaches to identifying and addressing organisational issues as well as their effects on these stakeholders. It gave due preference to these stakeholders' perspectives which shaped their relationship boundaries with the operational system of Organisation A.

However, there were occasions of conflicting comments made by the participants about the effectiveness of the research process in terms of meeting its objectives.   For instance, while it was observed during the Lean and Systems workshop sessions that the participants (junior staff) were not willing to have the presence of some other participants, a questionnaire respondent expressed a different opinion about the whole process suggesting:

"The senior staff and middle managers should have been present in the same Lean and Systems workshop to participate in the session" (a junior staff at the Brooding department).

Noting further that such could have saved time and facilitated a bonded discussion process that could lead to unanimous decisions and acceptance among participants. This was not considered in this research due to reasons already highlighted, such as differences in status, purpose and interest between the junior and senior staff of Organisation A.

Among the high points of the use of Lean and Systems is the fact that the implementation of an operational approach to Lean or Systems in exclusivity could result in outright negligence, whereby, the negative effects from a lean decision on a given part of a wider system could result in protest from the affected external stakeholders, who could not be considered in the research process. This points out that a suitable approach to keeping an organisation system in progress involves collaboration with stakeholders to identify issues of interest and develop ways to address them. As witnessed in this intervention, this has moved the stakeholders of Organisation A closer to the core operational objectives of the organisation and created an alignment of their interests, via a joint approach that is void of conflict between the parties.

Moreover the inclusion of non-literate personnel in some discussion slowed down the progress of the discussion. This required the use of interpreters to translate discussions. Some respondents suggested the need to conduct such sessions in native language other than the translation that was used (e.g. some junior staff who could not understand English or the Pidgin English Languages). They note that this would reduce the time

constraint involved with the translation of discussion, which the top management had complained about, as it tended to have prolonged the time taken for the sessions and distorted their operational process schedules. Others observed that it accommodated too much argument by participants would not help proceedings move on faster, leading to prolonged session as witnessed in this case. However, the issue of importance being attached to issue/s (whether departmental or general), was not a critical consideration in this research process. Instead all identified issues were addressed as important, involving the concerned stakeholders identifies at each stage of the research process.

The use of Systems tools alongside those of Lean have made the achievement of a holistic solution to identify issues become easier as the research process based its focus on the wider range of stake holders who are affected, rather than limiting decision to the immediate operation of the organisation, which used to be the norm among Lean authors.

However, the use of Lean and Systems proposed in this work was new to participants in this research process. This posed a significant challenge both to deliberations (data collection), and the implementation of relevant decision reached. But, as the intervention progressed, understanding and commitment among participants increased. As observed in the intervention in Organisation A, it points to the fact that time would be required for Lean and System tools to continue to develop and gain wider acceptance to fulfil its main objective of implementation in the Niger Delta region from a wider stakeholders' perspective, especially in the food production industry where this work was focused.

5.5 Summary

This chapter focused on evaluation of the various Lean and Systems methods applied in this intervention process. It adopted a participatory evaluation approach, involving the participants in the research process, via the use of questionnaire, discussion with the less literate participants, and the researchers' reflection on observations during the research process. It was aimed at highlighting the strength and weaknesses of the various combinations of different Lean and Systems tools as well as the data collection methods applied in the research process. High point of the evaluation approach is the difficulty in maintaining set boundaries which kept resulting in change of methods during the research process. Further details about the data collected and the methods would be discussed in the next chapter, based on extant literature on theory and practice of Lean and Systems.

6 Chapter six: Introducing Systemic Lean intervention

6.1 Introduction

This chapter discusses the main findings presented in the previous chapter, based on the extant literature. The main idea of this chapter proposes that Lean and Systems tools can be merged to address the organisational challenges of Organisation A, under a new approach that is defined as 'Systemic Lean Intervention' (SLI). The discussion adopts a combination of both Lean and Systems tools, inter alia, VSM, waste identification, process improvement activities, boundary critique, rich pictures and CATWOE. These were combined to identify and address systemic issues in Organisation A.

Systemic Lean Intervention is aimed at achieving effective balance between the affected stakeholders' expectations, the internal operational process and the top management objectives, via the deployment of Lean and Systems tools. While Lean practice would aim at achieving operational effectiveness through the identification and elimination of waste, its combination with Systems tools in this research could take it further to include a critical consideration of the effects of a major organisational model such as Lean in Organisation A, on other sub-systems that form the entire whole, and possibly engender further development of values from an earlier declared waste in the operational systems.

It was observed via the data collection process that a number of Lean concepts and tools (e.g. team work, continuous improvement initiative), tended to have been practiced in Organisation A. While this observation gave a significant boost to the introduction of Lean and Systems tools in this work, the comprehensive applications of these tools were completely new to the participants.

Writers (e.g. Gilliers and Jackson, 1997; Venters et al, 2003), have suggested the application of Systems Thinking on trans-disciplinary basis in organisational theory. These writers note that the inherent complexity found with Systems research, could tempt researchers to go beyond the usual approaches to explore other models along with those in Systems to be able to adequately address these complex organisational challenges. However, the full implementation of SLI was found to be relatively new to the participants, and this posed considerable challenge to the intervention process.

SLI application required the use of different tools – both from Lean and Systems (e.g. value stream mapping, boundary critique), to address identified issues in Organisation A. It draws on Soft System Methodology (SSM) (Checkland, 1981; Checkland and Scholes, 1990; Checkland and Poulter, 2006) and in particular rich pictures and CATWOE. Checkland and Scholes (1999) describes SSM as a methodology made up of different methods that can both help to facilitate change and enable further learning. The emphasis on learning and improvement became important in this research process, as it was unlikely that stakeholders will have immediate answers to the deeply entrenched problems affecting the application of Lean and Systems, in the operations of Organisation A. This was due to issues such as low literacy levels and the fact that Lean and Systems as a whole practice tended to be new to these participants[22].

This chapter thus presents detailed discussion on the main challenges of Lean practice in Organisation A, the application and impacts of stakeholders' involvement in the SLI process. It also highlights the systemic issues with SLI in Organisation A, as well as the changes encountered in the process. It also discusses the methodological

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[22] Chapter 3 presents detailed review on the main research methods and approaches applied in this research process.

underpinnings of SLI in this research process and vital organisational issues (e.g. leadership), and changes in the operational process of the organisation.

6.2   Lean Intervention practice in Organisation A

6.2.1   The challenges of Lean Intervention practice

Effective Lean practice has been well documented in different perspectives in literature (see, Womack and Jones, 2003; Seddon, 2008; Chen and Meng, 2010; Kundu et al, 2011; Radnor et al, 2012).   This was observed to be of significant usefulness to identifying and addressing operational issues in the various functional areas of Organisation A.

However, Lean tools in the context of Organisation A tended to be weak in finding an all-round solution to the issues identified, mainly due to the connected effects of these challenges, cutting across different functions of Organisation A.   This observation therefore explains the complexity associated with these identified issues, which requires multiple approaches to address[23] .   Similarly, a vital tool like 'Just in time' did not apply to this intervention due to the current state of the operational process operated by the organisation, which is influenced by environmental factors denying the possibility of JIT practice. Also, due to the presence of aggressive leadership practice, team-work was not given a fair place in the intervention, though it was found to be in their operation. This was because of the autocratic style of leadership practiced in the

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[23]EIMaraghy and Urbanic (2004) identified organisational complexity in three forms: product complexity, process complexity and operational complexity. Although their research background is different from this intervention, it seems that a significant similarity in terms of operational process issues that were found complex in Organisation A.

organisation, although effective team-work became an accepted practice, as an effect to the SLI process in the Organisation.

Among the main Lean tools used were: rapid improvement and waste identification events. These were done in the form of Lean and Systems workshops with the intention to identify and address operational issues, leading to a continuous improvement practice in the operational process. Another tool used was the value stream mapping, which was used to develop process maps of the different operational practice of the various departments of the Organisation. This aided the use of other tools, like the waste identification events and supported process improvement events, by facilitating the participants' understanding of the operational practice at each department and the connected flow of activities within the operational process.

While it was observed that there are quite a number of linear operational activities which fit well with the implementation of Lean in Organisation A, it was noted that its operational structure has some conspicuous complexities in its operational process. This led to issues such as dependability between sections within its operational process (Haines, 1998). Although Haines (1998) had his/her research in different contexts, s/he tends to observe a common factor in the sense that Lean on its own may lack the potential to adequately address the emerging complexities (e.g. where there is less environmental stability, and multiplicity of affected stakeholders' expectations), within the operational system. Critics of Lean note further that these could breed some rigidities (in terms of standardised operational process with less room for flexibilities), via Lean implementation that could not fit well with emerging complexities (see, Towill and Christopher, 2002; Lee, 2004).

The complexities, entailed in Lean practice point out that the use of Lean alone in addressing these issues could engender sectional approach, which may seek to apply solution to identified challenges on an incremental basis i.e. continuous building on the model to achieve perfection. While Lean tools tend to focus on eradicating waste with less consideration for the effects from specific functional part of an organisation, while other parts that are influenced or affected may be neglected or made to suffer adverse effects from such effort (see, Womack, et al 1990; Byrne, 2013). While these writers argue that Lean approaches concentrate more on the current organisational function, with a significant relationship with the operational partners (e.g. suppliers), they maintain minimal concern for other external stakeholders who are affected by their operations, especially those who tend to command a wider systemic involvement in today's business practice, as found in Organisation A -e.g. the host community, in the case of Organisation A (see, Mitchel et al, 1997). This does not necessarily mean a total negligence to external stakeholders' agenda, but such narrow relationship with fewer stakeholder groups could not address the complexities faced by Organisation A (see, Womack and Jones, 2003; Fischer et al, 2011). This shortcoming of Lean could lead to 'end-to-end' negative effects. It could mean the success of Lean implementation on one part leading to breaches on the operations of other subsections of an organisational system, and possibly resulting in conflict between the Organisation and these affected stakeholders. It therefore follows that Lean per se may not adequately address these identified systemic challenges in Organisation A. This is because of the inherent involvement with diverse key stakeholders and the presence of operational issues that tend to be interwoven and dependent on different parts of the operational process of the organisation. Moreover, part of the complexity in the operational system of Organisation A is the lack of basic infrastructural support e.g. security, good road

network, irregular electricity power supply[24] which could significantly impair effective Lean practice that could be result oriented as it is in the developed world (e.g. Japan where the development of Lean was popularised), where these facilities are in place for effective uses (see, Adenikinju, 2003; Ikelegbe, 2005a).

In response to these weaknesses of using a single approach such as Lean, writers have suggested the use of multiple approaches in combination to address these complexities in an operational process (Haines, 1998; Taylor and Taylor 2009; Midgley 2000; Jackson, 2003). Examples of these approaches could be the use of methodologies such as Leagile, a combination of Lean and Agility applied in an operational process to address emerging complexities that would require both approaches at different parts of the operational process (Mason-Jones et al, 2000; Christopher,2005; Krishnamurthy and Yauch, 2007). Also, Critical Systems thinking- an approach used by Systems experts, applying different strands to identify and address complex Systems issues, using a combination of different methodologies (see, Midgley, 2000; Jackson, 2003; Mingers and Rosenhead,2004).

Therefore, the suggestion for a combination of ideas and approaches thus points out that Organisation A would require a suitable intervention underpinned by a 'Systems' approach, which would recognise the importance of paying attention to the various parts of its operational process and seek to adequately address issues identified, with the aim to effectively meet stakeholders' expectations. Hence, a combination of both Lean and Systems ideas to apply different tools in identifying and addressing operational issues

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[24] Refer to sections 4.11.1, 4.12.1 in chapter 4 for details on these operational challenges in Organisation A.

cannot be overemphasized. In the next section the rationale for SLI is further discussed with a particular focus on stakeholder involvement.

6.2.2   Stakeholder involvement during Lean intervention practice

In this section the literature on stakeholders' input (e.g. Blair et al, 2002; Ackermann and Eden, 2011), during process improvement is drawn upon. The presence of complexity in the operational process of Organisation A justifies the identification of different affected stakeholders who were affected by the operations of the firm.

It was widely observed in this intervention process that stakeholders' recognition and involvement posed the challenge of slow pace decision making and implementation due to several arguments and deliberations on relevant issues. However, it was conspicuous that the length of time spent with these stakeholders in this research process (e.g. workshops, interviews), became irrelevant as the benefits in terms of agreeable, and sustainable decisions achieved from the process were impacted to these stakeholders and Organisation A. The benefits would harmonise the interests of the affected stakeholders and facilitate team approach which lent support to learning among participants, which could be of advantage if adapted across the operational process of the Organisation. The Lean approach leveraged by Systems' tools will be very useful in including the interests of those stakeholders that were affected by the issues identified in Organisation A (see, Windsor, 1992; Trevino and Weaver, 1999; Franco and Montibeller, 2010; Spitzeck et al, 2011).

According to Williams (2002), the effectiveness of an intervention largely depends on the participants involved and their ability to apply collaborative skills to identify and address complex problems. Stakeholder involvement was crucial to the recognition of

underlying issues within Organisation A. Suitable tools, from Lean and Systems had to be utilised to identify those stakeholders who were affected by the operational process, to group them and engage them both in the identification of these issues as well as debating on how to address them via a participatory approach, which is canvassed in Lean practice (see, Liker and Hoseus, 2008; Midgley 2000).

Stakeholder involvement has resulted in multiple solutions during Lean intervention practice in Organisation A. Apart from addressing the issue of external concerns of the stakeholders, the research process has led to an improvement in the relationship between the leadership of Organisation A and these various stakeholders, though the process required a rigorous effort in deliberations and agreement to resolve conflicting issues. For instance, effective stakeholders' involvement in the intervention process led to the suggestion by the government agency for biogas electricity from the current live-stock dung in Organisation A, eventually accepted. It has provided the much needed relief to erratic electricity supply, which was crippling business operations and mounting overhead costs in Organisation A.

Therefore, Lean could be enhanced by System tools that offer the affected stakeholders the opportunity to express their views about the issues identified as well as partake in a consensus decision making process. They all make joint efforts in implementing the outcome which is jointly agreed to develop valuable changes in their operational process, while minding the impacts such changes would exert on the concerned stakeholders.

6.2.3 Systemic issues during Lean and Systems intervention in Organisation A

The involvement of different stakeholders who are affected in the data collection process created a platform to develop different suggestions that are of their interests and concerns in the operational process of Organisation A. For instance, this was evident in the areas of live-stock waste management issue in which the top management was able to develop a lasting solution via an effective consideration of the concerned stakeholders' expectations. Through the various session of deliberation on the issues between the top management and the concerned stakeholders, consensus was reached, recognising the challenge and its effects on both the organisation and stakeholders, and the development of a systemic solution via the use of bio gas electricity. This boosted the hope of a resolution in Organisation A, not just to address the issue of live-stock waste disposal management but also the challenge of power supply in their internal operational process[25].

Similarly, a participatory approach to Lean intervention practice enabled Organisation A to address the challenge of 'end to end' effects (e.g. the use of low quality input materials to mill live-stock feed). This was achieved through the use of various methods (e.g. boundary critique, process maps, waste identification and improvement events) (see, Agunwamba, 1998; Radwadeh, 2005; Balle and Reginier, 2007; Ufua et al, 2014). For example, the use of direct acquisition of input materials in the Feed Mill was alleged to have   resulted to fraud by the appointed organisational members, to address current challenges on different departments, leading to some adverse effects on other parts of the operational system. This was addressed by providing a holistic resolution to

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[25] Refer to section4.5.2 on poor management of waste at the Hatchery and Poultry.

these issues, with a fundamental interest and consideration for both the different parts of the internal system and the key stakeholders groups affected, like the different departments in the production section which need the feed for live-stock development.

 A significant improvement in the viability of preferred solutions to identified issues was enhanced by the use of Systems tools in the intervention process, which brought together, not just systemic ideas but ensured an all-round effect on the different parts of the operational system was being considered. This was achieved via the involvement of key stakeholders who helped to secure a common approach to resolving identified issues of interest among the participants, thereby gaining their acceptance and support to the operational decisions taken by the leadership of Organisation A.

The existing overlap in thinking between the leadership of Organisation A and the concerned stakeholders has led to the credibility of top management actions with these stakeholders, and avoidance of unnecessary resistance to change implementation process, via the involvement of these stakeholders from the onset.   It also set a platform for operational process 'fair play' which was built on a wider consideration of the perspectives of the different stakeholders' groups. Systems scholars have observed that systemic approach to addressing an identified stakeholders issues would provide a platform for a lasting solution founded on the support and full acceptability and support of the key stakeholders (see, Jackson 2000; 2003; Midgley, 2000).   Therefore, a participatory approach to identifying and addressing issues during Lean and Systems practice could stand as a wedge against certain environmental challenges such as resistance and/or scepticism from the affected stakeholders.   It can also serve as an exit out of crisis situation between an organisational leadership and the affected stakeholders both with the organisation and the business environments.

As shown in Organisation A, the stakeholders who have the capacity to prolong or object the chosen operational decisions in identified crisis situation were duly recognised to be part of the process of change initiatives which are the essence of Lean and Systems tools applied in this work under 'SLI' to improve the practice of Lean interventions.   This meant that when the people are granted the opportunity to participate, innovation and evolution can become the aftermath evidence (see, Midgley and Ochoa-Arias, 2004; Liker and Ogden, 2011).

Particularly, Lean authors (e.g. Liker and Ogden, 2011), have observed that stakeholders appreciate and show concerted willingness to participate in the decision as a mark of respect accorded them by the organisation. This was evidenced in terms of accountability, assumption of responsibility towards the overall success of the operational system of Organisation A.   Instead of being loyal to the boss and the office merely for instructions, which portrays a limited capacity to support the operational process, participants explore the possibility of learning in the research process. Authors (e.g. Seddon, 2008; Oliviella et al,2008), explain this further, noting that such participatory approach would make the organisation resilient to face operational challenges, discover more innovative approaches that would solve the identified challenges while retaining a versatile operational system.

Contrary to the observations of these authors about the usefulness of stakeholder's involvement in an intervention, it was observed in the intervention process that there could be some impediments in terms of differences in the forms of opinions and intentions, perception, stake and interest, status among the participants.   In the case of Organisation A, there were observations in which participatory approach (e.g. having workshops), became impaired due to these factors, prolonged argument among

participants especially about some complex issues identified[26]. In another instance, an evaluation questionnaire respondent pointed out a need to involve historical data rather than concentrating fully on qualitative research process in other to enhance a more balance intervention. These observations points out a crucial limitation in the use of participatory research process emphasised by authors (see, Midgley 1992, 2000; Jackson, 2003; Beers et al, 2006; Bryman, 2008).

To address these challenges, further details about the use of SLI are presented in the next section.

6.2.4   Effects of systemic intervention approach on Lean intervention practice

The application of SLI has gone beyond the practice of identification and elimination of waste emphasised by advocates of Lean (e.g. Jorgensen and Emmitt,2008), to include a pragmatic effort aimed at developing further useful values from what were earlier termed waste (see Ogbonna et al, 2007; Bond, 2012).   For Organisation A, via the instrumentality of continuous improvement initiatives, SLI has facilitated an operational process improvement that would ensure 'no waste' but more values.   Furthermore, if such a suggestion is adopted by Organisation A, it would amount to effective practice that matches the suggestion of zero waste practitioners.   Although zero waste practice seemed to be more popular in the public sector (both in the developed and in developing world), rather than in the private sector, achieving zero waste practice in this research context, is an emergence from SLI process, as this was not the original aim of the intervention (see, Mate and Trois, 2008; Young et al, 2010; Bond, 2012).

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[26] Refer to chapter 4 for more details about complex issues identified in Organisation A.

Affected stakeholders' involvement can be linked to current and emerging systemic issues. Seddon and Caulkin (2007) observe in their work on Lean in the service sector that, training positions the workers on a competent terrain to be able to handle a variety of tasks in an operational process. It makes the entire operational process become more aware and resilient to act in tune with the stakeholders' expectations that are subject to continuous changes. However, there is a significant difference between the context of these authors and that of Organisation A, in the sense that their research was based on the service sector and in a developed society with different cultural backgrounds. Their suggestion points to the fact that effective Lean practice would require both managers and operational staff to be actively involved in continuous professional development alongside the demands or expectations of the stakeholders if their intention is to become a Lean organisation.

It is noteworthy to state that such initiatives would engender change which may come with some discomfort, profound shift in thinking about the design of the ongoing operational process, placing necessary demands on the top management to embark on relevant changes in certain models, aimed at achieving more effectiveness (see, Radnor et al, 2012). For Organisation A, this issue tends to be of significant focus as they attempt to practice Lean and Systems operations. This is partly due to certain issues such as the current leadership and decision making approach in their operational system, which may require significant modifications to suit their intention to adopt Lean and Systems practices.

6.3   Systemic Lean Intervention in Organisation A

6.3.1   Conceptual underpinnings of Systemic Lean Intervention

Systemic Lean Intervention is underpinned by a wider stakeholder representation, via the use of Systems tools and boundary critique in particular. It adopts exploratory action research, which informs the development of joint plans for changes based on expectations of the stakeholders involved. This approach to the research process draws on Midgley (1997b; 2000; 2003b), who defines Systemic intervention as a purposeful action by an agent/s to create a change.   Systemic intervention offers the free opportunity to the agents (which in this research case are the researcher and stakeholders), to take control of the intervention process based on their level of understanding.

The application of SLI as a conceptual model for intervention in Organisation A is set to provide a fair ground for all participants who are definitely affected and involved with the operational process of the organisation, rather than being subjected to the dictates of the researcher. While Lean intervention stands as an approach to efficiency and value by eliminating waste in an operational system, the application of Systemic intervention allows the combination of different methods drawn from different methodologies to address problems based on the methodological understanding of the intervener/s (see, Midgley, 2000; Córdoba and Midgley, 2006; Midgley, 2011; Ufua et al, 2014). Therefore, SLI allows the intervener(s) to define their context of the intervention based on their defined acceptable principles.   As earlier discussed in this chapter, it was observed that the operational issues in Organisation A were simply unstructured and interwoven which assumed the form of wicked problem situations that require more than a content philosophical approach (i.e. a single approach) to be addressed (see

Rittel and Webber, 1973 Midgley, 2000;Grint, 2005; 2014)[27]. These challenging issues led to the formation and application of SLI in this research process.

SLI therefore adopts a process philosophy, which allows the recognition of diverse operational issues from the complex or wicked problems faced by the organisation via the use of boundary critique to design an underpinning approach to its implementation. It applies a subjective approach which gives the participants the discretion to fully participate in setting the boundaries at various stages of the intervention process, to embark on the identification and deliberation on operational issues of concern to them on the choice of suitable means to address them (Midgley, 1997b; 2000;Yolles, 2001; 2007; Franco and Montibeller, 2010).

As an action research based intervention, the research process aimed at initiating change in the operational process by those involved. These participants have the freedom to engage in decisions and judgement based on the outcome of the deliberation in the research data collection process (Checkland, 1981; McNiff, 1998; Franco and Montibeller, 2010).

While most basic research practice would follow a particular paradigm or more, SLI draws on principles from a variety of paradigms in the intervention process. This flexibility in the choice and use of approaches tend to fit well with research issues that

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[27] Also, for further detail on complexity, refer to the section 2.14 in chapter two.

assume complex features, which would require more than a particular approach to adequately address.[28]

The application of SLI was not expected to yield a consensual action plan from the intervention, but to adequately recognise the diversity of opinions of the different participant groups and emphasise on increasing understanding of different perspectives of the identified problems. It would trigger the development of potential solutions via effective value judgement on the different suggestions advanced by these participants in the intervention process.   This includes the recognition of emergent issues from the process, (i.e. Sacred or Profane), which will inform further reviews on established boundaries for further deliberations. It would ensure that the participants can develop more informed actions in the longer term, choosing which decisions to implements or ignore (see, Midgley, 2000).   It is in line with the observation of Womack et al (1990), noting that the practice of good (internal and external) stakeholder relationships management formed the root of the success of Lean at the early stages of its development, though their approach is criticised in this research due to their adoption of a   narrow stakeholders' approach.

SLI creates a platform for critical reflection on boundary judgements and embraces the needed flexibility for decision making as emerging issues demand for continuous improvement in the operational process.   This is essential to effective SLI as evidenced by the case where the management and stakeholders of Organisation A, has embraced

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[28]   More details about the paradigm and metaphors are presented in section 3.3 on the methodology chapter. Also see, Midgley 2000; 2011; Jackson (2003).

the need for continuous actions in their operational systems in line with the dictates of the environmental forces. These shape the expectations of the concerned stakeholders at each point in their operational system. Midgley (2000;2003b) observes that, such emergent decisions and plans from a participatory intervention need to be viewed in temporary terms in order to create a resilient focus among the participants, and meeting environmental changes that may demand further improvement effort that can sustain the operational process for the future.

Scholars (e.g. Checkland, 1981; Checkland and Scholes, 1990), have noted that participatory action research process (in this research case, SLI) facilitates learning and improvement among organisation members (e.g. the junior staff, middle managers, the host community representatives, in the case of Organisation A). They realise that such learning supplements existing knowledge of the context, and creates a platform for further exploration of variety of thoughts and interpretations by the participants to arrive at suitable approaches to improve the operational process (see, Nonaka, 1991; Nonaka et al, 2000; Nonaka and Toyama, 2003).

 While extant literature may emphasise on the individual learning and development, it is necessary to note that the level of information and learning acquired by the organisational members would have significant influence on the amount and quality of information flow in the entire operational system. Other authors extend this view further, noting that in an ideal situation, there may not be a ready-made consensus of ideas from such participatory effort, but instead the participants are offered the opportunity to express diverse views over issues of interest to them, which facilitates further learning as well as development of solutions to identified problems (see,

Watkins and Marsick, 1993; Brown and Packham, 1999; Checkland, 1999; Midgley, 2000).

For instance, it was learnt that the leadership of Organisation A made several decisions regarding the supply of input materials and the functioning of the Feed Mill, paying due attention to the effects on other parts of the operational system. This systemic concern for the other parts of their operational structure has accounted for several alterations and adjustments on several decisions to find a formidable systemic balance that can lead to an all-encompassing improvement on the entire systems. As Hector et al (2009) notes, it helps in the structuring of identified complex issues by those who are genuinely affected in their operational process and making the design of an acceptable solution become easier.

Organisation A, via the implementation of continuous improvement initiative in their operational system, achieves zero waste model in the management of a portion of their current live-stock waste. This has resulted to a significant practice of prudence in their operations and helped to address the challenges related to the complaints of live-stock dung dumping in the host communities, and meeting the regulatory government agency's operational standard requirements for a clean operations environment. While zero waste could be achieved via this research process, the use of SLI affirms the fact that the definition of waste in an operational system could not stand a universal acceptance due to differences in contexts and environmental forces of changes, usually initiated by the stakeholders, as seen in Organisation A. In other words, what was earlier declared as waste could become valuable via an intervention like the SLI in Organisation A "…all moral judgements are spatially and temporarily located" (Midgley, 2000: pg207).

While SLI practice may be new to Organisation A, improvements achieved were noteworthy. For instance, apart from promoting a sense of ownership among these stakeholders, SLI has equally helped in the avoidance of further waste by seeking to adopt an agreed acceptable solution to these complex systemic issues within their operational system. SLI became instrumental to harnessing interests and participation, cutting across boundaries in the operational structure of Organisation A. It facilitated the achievement of their core values, and helped sustain 'an all-round systemic improvement' in decision taking at different parts of the operational process (see, Womack, 1990; Haines,1998; Midgley, 2000; Byham et al, 2002).

The next section is devoted to discussion on the methodological considerations of SLI in Organisation A.

6.3.2 Methodological underpinnings of Systemic Lean Intervention

This research suggests SLI as the means to achieving sustainable process improvement in Organisation A. The specific intervention combines tools and concepts from Lean and Systems Thinking (see, table 6.1). This is a significant contradiction with the suggestion of writers (e.g. Seddon and Caulkin, 2007), because their work was based on the service sector, or Gregory (2007), who seek to compare between systems operational performance, in the light of Seddon (2003)'s Lean system thinking in the public sector and the viable systems model (VSM). Apart from the commonality in terms of their emphasis in adopting a systems participatory approach to an intervention process, these works are dissimilar to this research in the area of industry of focus. While Seddon and Caulkin, (2007) applied multiple case studies, Gregory (2007) applied a reflective comparison as dominant approach to his/her research process,

respectively. However, their conclusive idea of participatory Systems approach to Lean implementation, which emphasises on the interactions between different subsystems that form the whole was applied in this work.

A basic foundation to the application of different methods was the recognition of the different parts (sub-systems) that form the entire operational process of Organisation A. This was aided with the development of basic understanding of the functionalities and interconnectedness between different parts of the operational system of Organisation A. It also helped to identify the affected stakeholders to the operational activities at the different parts of the Organisation and its environment. In line with Lean authors (e.g. Womack and Jones, 1996; Lasa, 2008) the usage of value streams supported a functional approach, aimed at viewing the organisational systems with the aim to apply SLI. Value stream mapping provided a space for the application of other Lean and Systems methods and concepts (e.g. boundary critique, waste identification and process improvement events)[29]. Seth and Gupta (2005) note process mapping would provide a picture of the current state of an operational process and set a guide on how to effect necessary improvement. They however caution that the intervener/s must mind the Lean principles that underpin its application in an intervention. The methods underpinning SLI are extrapolated in Table 6.1.

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[29]See the sections on the different departments in chapter4 for further details on the use of these Lean and Systems methods in the intervention process.

Table 6.1: Methods underpinning SLI in the research process

Lean Systemic Intervention		
Lean methods/tools	**Definition**	**Operationalization**
VSM	Aimed to understand the operational systems, recognise the existing relationship between different parts and the various affected stakeholders	• Process maps • Participants Observation
Waste identification and Process improvement Events	To identify operational waste/s and their impacts on stakeholders. Aimed to initiate Lean and Systems changes, while minding the impacts on other relevant sections of the organisational system	• workshops • Participants observation
Systems methods/tools	**Definition**	**Operationalization**
Boundary Critique	Setting boundaries	Personal interviews, Workshop, Observation.

CATWOE	Selecting relevant participants	Personal interviews, Workshops
Rich Pictures	For clarity and Understanding. To express the identified issues and suggested solution for better comprehension by participants	Personal interviews

SLI methods included the definition of initial boundaries through interviews. Boundary critique, as used in research by authors (e.g. Midgley et al, 1998;Yolles,2001;2007; Midgley and Ochoa-Arias,2004), was applied in the selection of participants and the relevant issues to be discussed; the latter were based on the perspectives and assumptions of the participants. The use of set boundary influenced the choice of data collection methods.

Midgley (2000) proposed the use of boundary critique in two forms: primary boundary and secondary boundary which would produce emergent properties that could either be sacred or profane. However, this work applied just a single boundary approach that seeks to achieve a common ground among stakeholders in addressing complex issues. This includes adjustments in terms of participation and discussion, depending on the context (see, Beers et al, 2006). While this is not a full contrast to Midgley's approach, it was adopted for simplicity reasons in the intervention process, as some of the

participants were not literate to be able to adequately differentiate between Midgley's primary and secondary boundaries.

Following the set boundaries was the focus on possible systemic actions to identify operational issues, deliberated upon to improve the situation. This was achieved via the conduct of boundary interviews with participants (internal organisation members and the relevant external stakeholders' groups' representatives). This effort helped in identifying main operational issues and the stakeholders affected.

Applied alongside boundary setting interviews was the use of CATWOE. This was instrumental in the selection of the affected stakeholders and created an effective boundary practice that recognised the interest of the participants at each stage of the intervention process, based on the relevance of their stake with the identified issues.

This informed the conduct of workshops at different levels, participant observation and using various Lean and System tools, bringing affected stakeholder groups together or seeing them separately. They were supplemented with further interviews with individuals. These were carried out with the identified stakeholders based on the set boundaries, though there were flexibilities on set boundaries.

Waste identification and process improvement workshops were useful at this stage because they allowed participants the opportunity to learn from one another and develop better understanding of the identified issues of interest. However issues such as power relationships, individual preference, and time constraints kept posing challenge to the use of workshops. Another example, on power relations was when the host community representatives kept refusing to have a meeting with the top management on identified issues, claiming they had explored all options for negotiations and resorted to public

protests to demand an outright action from the top management. There were also instances where some internal organisation members declined to comment or participate in the intervention process (e.g. workshop), due to the fear of what actions might be taken against them by the top management, even though their purported contribution were not to hurt anyone's interest.

To address these issues, adequate attention was given to boundary critiques and sometimes, creating new boundaries to create an atmosphere for a fair participation. This was achieved via the use of alternative data collection methods such as the interviews, used as complement to gather further data (e.g. further comments about issues earlier discussed at the workshops or observed issues that unfolded during the intervention process), from relevant individual participants, where necessary to offer adequate use of the entire SLI in the research process.

While researchers (e.g. Macadam et al, 1990; Checkland and Scholes, 1999), would suggest the use of CATWOE alongside other SSM methods in an intervention, it was however applied along in setting boundaries on complementary basis. CATWOE was more useful in the intervention process as it provided the flexibility for maximum participation and productive contributions by the stakeholders.

Some writers (e.g. Jackson 2003), have criticised SSM as a methodology for failing to adequately address coercion among participants in an intervention. Mingers (1992) narrows his/her criticism to CATWOE on the fact that there is bound to be flexibility of status assumed by participants under CATWOE (e.g. owners, customers), noting these could be due to changes in the environments and the interest of the participants in an intervention. Other writers (e.g. Bergvall-Kareborn et al, 2004) provide a suggestion for

the modification of CATWOE to enhance a reflection on the context under which an intervention is carried out.

However, the combination of CATWOE and other Systems methods in this research process provided a means of learning more about the perspective and wishes of the participants in the research process offering a clearer view of the boundaries, creating a valuable access to more relevant information needed for the intervention process.

Although there were conflicting opinions among participants during the intervention, the use of methods such as CATWOE was explicitly applied to absolve the difficulties associated with boundary setting in the research process, which were mainly due to the interconnectedness of most of the issues addressed. Participants were not just to highlight the challenging issues but finding a common ground, in terms of developing solutions that would be acceptable to all participants. CATWOE was employed alongside other systems tools to help in the selection of participants based on how they were being affected by the particular issue under discussion, during the intervention. This facilitated the setting of boundaries at each stage of the research process. This joint approach to the intervention created a foundation for the application of other SLI tools (e.g. VSM, Waste identification events, process improvement), to address the operational process of Organisation A[30].

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[30] A number of writers (e.g. Womack and Jones, 1996; 2003; Hines and Rich, 1997) have highlighted major types of waste including:

(1) Overproduction;

(2) Waiting;
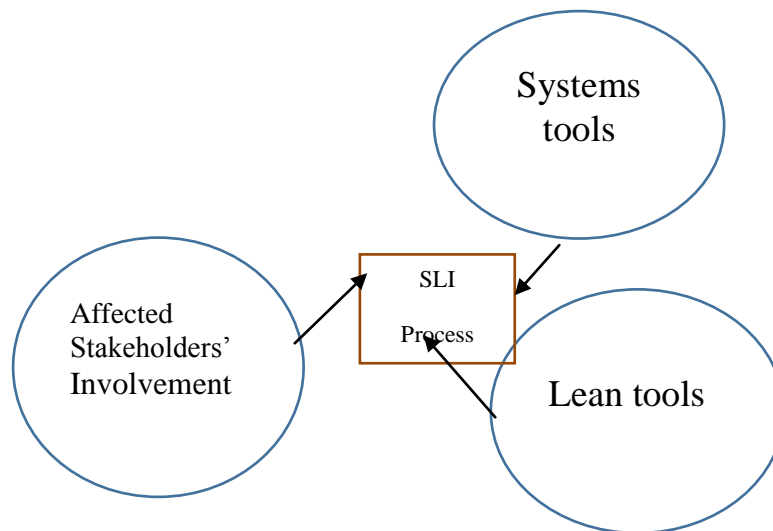
Figure 6.1 The proposed SLI model.

(3) Transport;

(4) Inappropriate processing;

(5) Unnecessary inventory;

(6) Unnecessary motion;

(7) Defects.

It is relevant, however, to note that these types of waste were identified in different industrial backgrounds and contexts other than the ones found in Organisation A, where identified waste assumed different forms which are familiar with the food production industry, as well as the environment where it operates (Refer to the sections 4.5.2, 4.6.1., 4.7.1 in chapter 4 for details on waste identified in the operational process of Organisation A).

6.4   Challenges encountered during Systemic Lean Intervention in Organisation A

It was observed during the application of SLI that there were a number of significant challenges that were prevalent in the organisation system. The main operational challenges encountered in the process of SLI in Organisation A are presented in this section.

6.4.1   Challenges and impacts related to Leadership Approach

From the data collection process, it was learnt that Organisation A adopted an autocratic leadership in their operation.   This was observed to be responsible for the distant relationship between the different levels in the operational systems implemented in Organisation A. Writers (e.g. Osaghae et al, 2007; Akata, 2008), have recognised the conflicting challenge between the leadership approach and organisational mode of operation, as an inherent issue among contemporary firms in the Niger Delta region of Nigeria, where Organisation A operates.   The impacts of autocratic leadership have resulted in a discrete operational practice across the operational process of Organisation A and its stakeholders. It has resulted to certain operational challenges witnessed in the system, as documented in the previous chapter. Bolden and Gosling (2006) identify leadership competency as a factor that can enhance the individual's competence on a job. Boyatzis (1982) says competency is the underlying characteristics of an individual that is related to effective performance. Bolden and Gosling (2006) conclude with the suggestion that leadership would need to embrace the contributions of other organisational members, as well as other environmental partners in the task of leadership. Although the background of Bolden and Gosling (2006)'s observation is

different from that of Organisation A, their conclusion points out that leadership competency without effective collaboration may not yield the expected results. Rather, it would likely project the individual leader on the path of autocratic approach which may not offer any room to address the quest for participatory leadership requirement, which Organisation A would need to apply in Lean and Systems practice.

For example, the junior staff were kept on the receiving end- barely acting to implement top management decisions in the internal operations of the organisation. This also seemed to constitute a pre-established barrier to effective flow of activities, which hinders the opportunity for these junior staff to offer any suggestions or modifications in their daily operations that may be necessary, except authorised by the top management. Similarly, the middle managers were not granted the free authorisation to either take part in some professional decisions (e.g. acquisition of the right materials), or completely had to adopt the decision of the top management on certain critical issues. It aligns with the observation of De Cremer (2006), noting that most autocratic leadership limits organisation members (e.g. middle managers and junior staff), and imposing decisions on them, while sometimes, their suggestions were disregarded. This practice was observed to have kept the members uninformed about certain changes in Organisation A. For example, members were required to either wait for due approval before certain organisation decisions were implemented.

Vugt et al (2004) expressed the concern that autocratic leadership may not be effective for the long term in a group setting due to minimal participation by the members in decision making process. For Organisation A, this obviously could be due to the intention of the top management to achieve a prudent usage of the firm's available

resources (efficiency objective), via a streamlined operational approach, scheduled to systematically address the various challenges in their operational process.

The leadership style resulted to the challenge of operational process ineffectiveness as it was observed from the data collected. Many of the challenging issues identified in the operational process of Organisation A, were interwoven and tended to cut across departments and functions and even affecting different stakeholders.

However, Vugt et al (2004) noted in their research that operational contexts that require centralised leadership might be better off via autocratic approach. They also observed that an advantage from this leadership style is the absence of unnecessary competitions and negotiations in its approach, which might be encountered in a democratic leadership setting and such, could result to negotiations that can lead to delays in decisions.

For Organisation A, the choice of autocratic leadership style was somehow justified by the fact that the organisation needed to act in the way they do to address other operational issues such as checking fraudulent practices among organisation members at different levels of the operational structure. According to findings collated from respondents, the organisation had related challenges (e.g. fraud among organisation members), which the top management chose to address via a streamlined operational process. They hoped they could redeem the process and sustain their quest to meet stakeholders' expectations. De Cremer (2006) notes that the acceptance and success of an operational decision could be influenced by the level of participants' involvement in the proceedings of the operational system.

While it can be arguably said that the use of autocratic style is an instrument of control and fraud prevention in the operational process, a further view at its effects would show

that other vital parts of the operational system suffer setbacks in areas such as delays in decision and actions and other bottleneck activities within the operational process. Womack and Jones (2005); De Cremer (2006), observe that the adopted approach to running an operational process influences the success or failure of any organisation's functions, noting that no matter how good organisation members are, if they are placed in a wrong system, failures are bound to ensue. However, this was observed to constitute a significant obstruction to effective SLI in Organisation A, because all activities were being anchored on a top-down approval basis, with minimum room for flexibilities in the operational system.

While Van de Vliet (2006) argued in favour of autocratic leadership in certain contexts such as simple agrarian organisations where close supervision is the norm, s/he however noted that the presence of complex organisational issues would render autocratic leadership ineffective. Following Van de Vliet (2006), this study argues that leadership approach that empowers stakeholders to participate in the leadership process is appropriate, especially in situations that may require immediate attention such as in the case of Organisation A.

This view coincides with Seddon and Caulkin (2007) and their work on the implementation of Lean systems in the service sector. They recognise that sometimes the subordinates' stepping out of the confines of their autocratic leadership mandates could attract unwelcomed attention from their superior/s which could lead to sanction. They further suggest that effective Systems practice requires the leadership (e.g. top management, for Organisation A), to put aside the targets and specifications and encourage a joint participatory effort aimed at addressing organisational issues, which they observe could lead to eventual gains in the operational system.

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Autocratic leadership practice was responsible for the delays and indecisions observed in the application of SLI, which tended to have made the leaders of organisation A ignore the need for right actions and at the right time, at par with the expectations of the stakeholders.

The context underpinning the argument of Seddon and Caulkin (2007) was different from this research, with the current practice of streamlined leadership approach in Organisation A, which tended to have strengthened bottlenecks. It could be argued here that the full adoption of SLI would be slowed down by the resulting rigidities of boundaries associated with positions in the operational structure of Organisation A, regardless of its potency in the control of fraudulent practices across the operational system of the organisation. This notion tended to have been misinterpreted by the leaders of Organisation A, who gave less attention to the internal stakeholders' expectations (e.g. the junior staff), which formed the essence of the supposed effectiveness in their operational process in the name of efficiency (see, Radnor and Osborne, 2013).

These issues, ranging from the current leadership style and the positional rigidities in Organisation A which does not allow free interactions across the operational structure, are in sharp contrast to the submission of Lean and Systems authors (e.g. Womack et al 1990; Womack and Jones,2005; Seddon and Caulkin, 2007; Liker and Hoseus,2008). They note clearly that the original Lean practice requires certain qualities such as collaboration and team work, trust and dependence among organisation members and connectivity between sections that form the systems operated by the organisation. It requires an in-depth attention from the management of Organisation A in their quest to implement Lean and Systems changes in their operational process.

Another reason for encouraging a rigid operational approach was for management to achieve an all-around standardisation in the operational systems. This was justified with the fact that the operational requirement in the food production industry, especially live-stock management, requires strict adherence to set standards. While a number of authors (e.g. Christopher and Towill ,2002; Lee, 2004), explained that Lean tends to support more of a streamlined operational process in some contexts, Gregory (2007), expressed the concern that tenacious adherence to such streamlined management approach/es can pose the risk of rejection and protest by some organisation members (e.g. junior staff), and possibly lead to some unintended consequences that can result in breaches on interactions between different parts of an organisation system. She noted that if such breaches are allowed to persists, they could lead to further complexities within the operational system and result in loss of trust and commitment to the operational system and its leadership by the organisation members.

Autocratic leadership approach negates the original platform upon which Lean was developed, which was based on human interactions and contributions of ideas towards achieving effectiveness in an operational system that leads to waste identification and elimination (see, Ohno, 1978; 1988; Womack et al 1990; Zhang et al, 2002; Samddar and Heiko, 1993). It is therefore argued that the leadership approach is a critical concern to the success of SLI in Organisation A, especially in the quest to identify and eliminate waste, develop values, as well as considering the connected effects on different parts of the operational structure. The freedom and willingness to jointly identify and work out ways to eliminate waste by these concerned internal stakeholders could be impaired with minimum autonomy for participation in the operational process, though justified by the top management.

This research therefore argues that autocratic leadership practice with SLI would lead the organisation to a functionalist structure which encourages minimal human intervention and modification, making the operational structure to become more prefixed (see, Jackson, 2000), and recognising that humans do not have much authorisation to influence the operational system even when necessary (Midgley, 2000).

6.4.2   The effects of leadership style on organisational staff

The effects of the leadership style were evident in the repeated occurrence of some adverse effects (e.g. massive live-stock mortality issues, loss of effective communication and timely information flow across levels of the organisation), leading to further waste generated in the operational process[31]

This was equally observed to be responsible for abuse of position and unwarranted punishment implemented by some managers on staff in the course of their duties, which could also have inflicted a significant display of inferiorities, intimidation on the victims of this leadership approach (mainly junior staff), and apparently hindered them from making further contributions towards the progress of the operational process of the Organisation A.

Gosling and Mintzberg (2003), focusing on developing their leadership skills to effectively lead an organisation, based on the prevailing context of their operations. They emphasise on collaboration with other organisational members and partners to be

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[31](See, report in chapter four).

able to chart a course for effective leadership practice. Similarly, Grint (2014) suggests the need for leadership to continue to reinterpret their leadership approach to embrace the relevant flexibilities. Such reinterpretation would inform decisions and actions that suit the contexts and interests of the stakeholders at different times, instead of a 'strict command management' approach that has limited room for effective collaboration with other members of the organisation. This practice of collaborative leadership was observed to be slack in Organisation A, as there seemed to be a significant gap between the leadership and the rest of the members of the organisation. Midgley, (2000), notes that failure to involve the affected organisational members (in this case, concerned stakeholders), in an intervention could result in an 'expert driven' decision that points to an autocratic leadership. Such have also been known to result in conflict, especially in the Niger Delta region, where this research was based (see, Ibeanu, 2000; Osaghae et al, 2007; Akata, 2008).

Furthermore on the leadership style in Organisation A, it was learnt from some participants' remarks that, part of the reasons for their chosen leadership style is due to certain cultural issues that are common practice among leadership practitioner in the Nigerian society, where Organisation A operates. Wanasika et al (2011), support this in their research on broad leadership practice in African society, noting that several famous African leaders, both in the public and private sectors, tend to demonstrate cultural instincts in their leadership approaches. Although this claim was based on wider research finding on the African continent, the main argument tallies with the observation in Organisation A. For instance, a manager (at the Administrative office) remarked during data collection that:

"*Aggression is part of the culture and therefore could not be changed*".

This comment shows that autocratic leadership which tended to encourage 'passing the blame' to the helpless subordinates, is a treasured subset practice that is traceable to the cultural traditions of the societal location, where Organisation A operates. And this comes in sharp contradiction to SLI. Such claim obviously denies any interruption on an established operational process, not minding any justification from the organisational members, which was conspicuously observed in the data collected (see the chapter on data findings for details). Osuagwu (2002), in his account on the implementation of effective total quality management strategies in Nigeria, s/he noted that the host environmental forces (i.e. culture) influences the management style chosen by an organisational leader, which s/he notes are usually manipulated to enhance their survival. Thus, in line with Osuagwu, it is argued that host environmental culture stands a chance of significant influence to the management approach to an operational process, like SLI.

This study therefore posits that the extent to which SLI can succeed in Organisation A would be dependent on the level to which the top management and the executive are willing to accept its principles, possibly in exchange for the existing cultural norms. Autocratic leadership style is contradictory to Lean or Systemic practice where participatory approach is encouraged at all levels of the operational process (see, Midgley,2000;Byham et al, 2002). It is also argued that a shift should take place, following authors (e.g. Womack et al, 1990; Byham et al, 2002; Testani and Ramakrishna, 2011; Bass and Riggio 2012), from autocratic to transformational leadership, which is based on consultation among stakeholders. This suggestion is in sharp contradiction to the transactional leadership approach, captioned on a platform of

bureaucracy and streamlined bottle neck practices, which formed the autocratic leadership observed in Organisation A.

Transactional leaders are those who practice a prefixed leadership approach that only meet the subordinates for query when things go wrong within the operational process. They tend to believe that perfection is always achievable in the operational process (Testani and Ramakrishna, 2011).

Lean scholars observe that the implementation of Lean tools do not rule out standard responsibilities of leadership in an organisation such as staff discipline and promotion, which they claim are also needed for the control of the entire organisational system (see, Liker and Convis, 2012). Other writers (e.g. Mann 2005;2009) suggest the need for Lean managers to adopt a gradual introduction of Lean tools as a means of overcoming emerging resistance from organisation members who might have been used to an existing culture of operation, in order to offer the internal organisational members the opportunity to adapt and attune to the proposed Lean and Systems changes. This therefore opposes the argument of transactional leaders who would want instantaneous implementation (see, Testani and Ramakrishna, 2011).

Liker and Hoseus (2008) have noted that Lean, being a philosophy and a practice, requires the involvement and learning of different tools, needing complete dedication of the management to the course of its implementation. It also requires concerted human capital development, in the direction of the intended purpose of Lean and Systems in the operational process, while acting to keep the standard organisational practices to maintain discipline and compliance across the structure of the organisation. It is therefore argued here that the leadership of Organisation A may not need to amend its

current leadership approach. But there be would need to act to close the gaps existing between the management and the staff (mostly junior staff and the middle managers or top management and the entire organisational system operated by the firm). Dockel (2003) notes that democratic leadership seeks to support the staff emotionally, contributes positively to workers' performance, commitment and confidence in their organisation. It needs to embraces further collaboration, while applying effective control measures to check operational process challenging issues highlighted. Grint and Jackson (2010) support this noting that leaders would need to make hard choices and decisions if they wish to achieve envisaged positive changes for the future in their operational process. Such would require the collective responsibility of the leadership and the organisation members Grint (2010). Barton and Delbridge (2001) support this practice of participatory leadership approach, suggesting that subordinate participation in relevant shop floor decision making processes facilitates speedy flow of activities and offers a significant relief to the top management in an operational system.

6.4.3   Lack of information flow and impact on decision making

Another case of concern for the implementation of SLI in Organisation A, is the issue of filtration of relevant information, which was highlighted by junior staff which amounted to misrepresentation of their interest before top management.

This was also evident in the practice of rotational posting of staff to different sections that were unfamiliar to them (both junior staff and the middle managers) without carrying out a proper orientation for these staff to acquire the needed skills required to function optimally in their new post.   As a result, instead of staff embracing this rotational posting, they rather scorn it as 'multitasking'.   In effect, it was observed that

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inadequate number of employees (mostly junior staff at the various departments) had ended up with the challenge of 'under staffing' which resulted to wasteful challenges such as product breakages, delays in information deliveries.

Seddon (2008) suggested the application of a systems approach in the public sector to address operational challenge/s, instead of running such as a functionalist approach that is based on demarcation and exclusivity of the different functions. S/he argues that effective systems practice would commit the members to take effective actions that can lead to success on the set objectives of the different functions. While the context of this argument was quite different from this research, it points to the fact that practicing SLI- which embraces systems approach, can lend support to effective circulation of information across an operational system, and also engender positive reactions that consider the effects on the others parts of the operational system.

Similarly, Nonaka and Takeuchi (1995) emphasise on the need for effective relevant information flow across organisational structure, which they refer to as "redundancy" (p80-82). They observe that the relevant information sharing, apart from being responsibility of all organisation members, it enables members to participate in the proceedings of the operational process. This could be of importance to Organisation A, in their quest to implement SLI, if the practice of timely circulation of relevant information across the operational process is sustained to enhance effective exaction of operational activities that can result in the successful avoidance of waste in their operational process. Nonaka and Takeuchi (1995) note further that, relevant information sharing could facilitate development across levels of the organisation. They explain that such effort would enhance the staff skills development, prompting them to work with less supervision and promote an overlapping leadership culture, and at enhancing

innovation development within the operational structure that would engender productivity in the use of resources (see, Lee at al,1997; Yusuf and Adeleye, 2002; Achanga et al, 2006; Smith, 2011).

However, the present approach to information circulation or management, adopted by Organisation A tended to encourage disinterest (especially among junior staff), which obviously is a challenge to the intended purpose of SLI.

Insufficient information sharing also placed a challenge to the free flow of actions in the operational process, by hindering employees' authorisation to suggest or modify operations to avoid foreseeable issues that could be adversarial to the objectives of the operations. For example, it was learnt that the authorisation to decide on the kind of materials needed for live-stock pen houses was solely given to the top management alone without seeking the advice of the middle managers, involved, which contributed to live-stock Mortality challenge in Organisation A.   Hibbert et al (2010) noted that operational process flexibility would engender positive reflection among organisational members and trigger a productive engagement among organisation members in various interactions across the different functions, which they would be prompting to question current operations and enhance the development of improvement steps for better results in the future. It thus suggests that for Organisation A, SLI could gain further advantage in the form of staff proficiency on the job which could help reduce incidences of waste in their operational process, via sourcing the right information from the right stakeholders who are involved or affected at a given point in the operational process.

As earlier noted, Organisation A opted to practicing a centralised decision making process due to the management's interest in maintaining control of staff excesses in the

operational process. It was also meant to reduce the occurrence of incidences of unaccounted actions that could lead to unwanted breaches in their operational process. They tend to maintain that this is better fitted with the delicate nature of their operational system, which is mainly concerned with live-stock management, coupled with the low level of literacy assumed by most junior staff currently on their employment. However, this explanation does not offer any justification for not authorising the middle managers and supervisors to take certain critical or professional decisions when necessary. Such could have kept their operational process afloat with emerging changes that may require immediate and effective responses, which are emphasised in SLI.

While Organisation A may wish to adopt new operational models like SLI, there is a need for them to strike an effective balance between implementation and the different varieties of expectations placed on the organisation by the stakeholders at different points in time. An effective control mechanism has to be enacted in the operational system that would ensure adequate checks on the usage of these Lean and Systems tools by the organisation members.

In the light of this, authors (e.g. Lee et al, 1997; Yusuf and Adeleye, 2002; Gregory, 2007; Tseng, 2010), have noted that the current pace at which changes occur in a firm's operational process, coupled with the need for timely dissemination of the right information and at the right time can promote acceptability, creativity and adaptability among employees and leaders in the organisation. They also note that such can become a source of sustainable competitive advantage through productive interactions with the organisation's environment, which Lean requires for effective implementation in an organisational system. For instance, the issue of unnecessary filtration of information in

their operational process were a major issue that could hinder Lean or System intervention in their operation. This was also because the use of inappropriate information, coupled with significant rigidity in their operational structure could deny the possibility of making necessary amendments, which accounted for the occurrence of incidences such as complaints rendered by the concerned stakeholders, (customers).

From this narrative, it is therefore argued that SLI is based on appropriate information sharing that can facilitate a comprehensive recognition of stakeholders' expectations, by organisation members who act in an operational process to satisfy these stakeholders (see, Midgley, 2000; Gregory, 2007; Tseng, 2010).

6.4.4 Issues related to insufficient development of staff skills

The level of literacy and learning abilities of an organisation's members can have a significant influence on SLI. This could also enhance the flow of the right and timely information needed for effective operational practices.

Arguably, these challenging issues (low level of learning and pace of adaptation to change), have constituted a breach to set boundaries across the different positions of operational structure of Organisation A, and pose a challenge to effective learning among organisational members at different levels. There is also a significant level of sharp contradiction to the notion of connectivity canvassed in Lean and modern organisational Systems practice, which is essential to effective networking among internal players in an organisational system for a possible all-round productivity. Organisational learning could be effectively enforced via complementary roles assumed by organisational members. (See, Midgley, 2000; Papdopoulos and Merali, 2008).

The top management made a decision to ensure a mandatory training program for the junior staff. Alongside this decision, it raised the recruitment qualification to Ordinary level certificate for subsequent junior staff employment (High school certificate). This decision would most likely enhance the professional development of staff and create a formidable platform for effective SLI practice. It would also facilitate faster adaptation to better organisational practice such as Lean and Systems, increasing overall interest in learning among organisation members, reduction in certain issues of waste such as live-stock mortalities via the initiation and acceptance of certain improvement models in their operations. Writers of Lean and Systems (e.g. Boyer, 1996), have labelled human skills development as a critical factor needed to set the stage for commitment to the organisational course of operations via an effective usage of resources that encourages an all-around approach to overcome unwanted breach to the operational system. Seddon (2008) notes that training could only become useful in an operational system in the public sector when the essence is designed to enhance the skills of the organisational members, to meet identified operational challenges, which can be regarded as the essence of the needed improvement in the operational system.

While these debates from extant literature and data collection phase suggest changes in Organisation A (e.g. minimum qualification for employment), this research argues that the firm needs to match their human resource development training program with its standing relationship tie with core stakeholders for effective SLI practices. An example lies in the agreement reached with the host community, which connotes offering job opportunities to their indigenes. Both the host community and the top management recognise the fulfilment of this promise to be relevant to certain practices within the operational system of Organisation A, such as security on their entire operational

process, which could become an issue of concern if they decide to go otherwise, (see details on the report on the previous chapter).

It is also argued that the effort to raise minimum qualification may address a significant part of the ongoing challenge, positioning the junior staff to become more useful to the organisation. But how would Organisation A address the challenge of leadership and rigidity of boundaries?

To answer this question, this research posits that the practice of SLI in the operational process would demand a further sacrifice from the top management, in terms of enacting a flexible leadership structure that encourages further participation among the organisation members, while focusing on the need to establish formidable control measures that ensure compliance to the organisational practices by members at different levels. This argument coincides with Conner (1998) who observes that participative approach to management of change in an operational process would put the management on a terrain to assume responsibility not just to initiate change but effectively managing the implementation of the proposed change on an incremental basis. SLI would also enhance the boundary flexibility that allows easier modification of set boundaries based on the dictates of the operational process, rather than keeping it fixed. This would allow effective practice that gives preference to joint organisational interest, while maintaining positional balances across the structure of the Organisation (see, Midgley, 1997b; 2000; Beers et al, 2006) .

6.4.5   Challenges related to the wider context of Systemic Lean Intervention in Organisation A

In this section it is argued that SLI practice in Organisation A would require careful consideration of the wider environmental challenges prevailing in the economy where it operates, such as slow legal systems and sometimes limited overall government support for organisational policies.   Environmental challenges like poor provision of basic amenities such as good roads, electricity etc are also among the external factors that paralyse business operations. (See, Okogbule, 2005; Odeku and Animashaun, 2012). The absence of these basic facilities, due to lack of governmental support needed for an effective business practice. This engenders a reaction from the practicing organisation to engage in a continual search and development of a possible alternative approach that provides a means to overcome such environmental inadequacies. For instance, these challenges stand a barrier to achieving certain supportive operational models such as effective 'Just in time' practices in the context of Organisation A. This is because there has been a challenge of delays in materials flow which Organisation A had to manage in their operational process. This issue places the practicing firms, especially those in the food production industry, where Organisation A operates, on a platform requiring continuous innovations and initiative development, with the aim of establishing continuous operational process resilience meant to achieve the set objective as well as the need to meet core stakeholders' expectations. And such would require effective application of resilient operational approaches like the SLI. SLI would help create the needed flexibility between the positions within the organisational structure and the members, and the stakeholders, via the involvement of the concerned stakeholders in the process, striving for productivity in the operational process (see, Kabayashi, 1995).

Organisation A has shown a level of commitment to the course of equipment and other infrastructure maintenance plan, which they deem important, especially with the new business opportunities. They regard this as a foundational factor required for standard SLI adaptation in their operational process that can lead to unhindered productivity that reflects stakeholders' expectations. Effective equipment maintenance is relevant to gaining stakeholders' trust, and commitment to an operational process (see, Boyer, 1996; Liker and Ogden, 2011). This is in line with the observation of some authors, that the failure of internal equipment maintenance among Nigerian firms, results in losses of opportunities due to the breakdown of machinery used in the operational process, leading to prolonged idle time. They advise operations managers to always develop proactive maintenance policies that seek to develop the necessary resilience to avoid incidences of idle time, traceable to equipment break down (see, Eti et al 2006; Abdulamalek and Rajgopal, 2007).

In due response to this, Organisation A, having identified poor maintenance as a waste in their operational system. The firm has passed the decision to engage the services of external equipment maintenance expert to maintain their equipment all year round for a more effective operational system. They realise that outsourcing their maintenance to a consultant to enhance dependable operational process would meet set operational objectives.

Liker and Hoseus (2008), note that the adaptation to Lean practice in a complete new environment would require a significant amount of time, for understanding and blending with the peculiarities of the existing culture. But for Organisation A, it is argued here that effectiveness of SLI, would partly depend on the willingness of the top management to work in collaborations with both the middle managers, supervisors and

even the junior staff, to ensure commitment towards the achievement of the set objectives and deal with environmental challenges.

6.4.6 Systemic actions and Systemic Lean Intervention in Organisation A

In this section, it is argued that having a full scale SLI practice in Organisation A, places a responsibility on both Organisation A and its stakeholders. Although Lean may emphasise on the immediate implementation of change for effectiveness (see, Liker and Hoseus,2008; Papadopoulos et al, 2011; Radnor et al, 2012), in an operational system, the actualisation of its systemic effects on an operational process such as Organisation A requires time. This can only be realised when those involved are ready to concede what is not working and allow for the needed flexibilities, both in decision and in positions, which calls for the systemic action by all concerned stakeholders. Such participants' flexibility in the intervention process would support the acceptance of all the concerned stakeholders and create an effective application of systems tools for productivity.

Seddon (2003) and Seddon and Caulkin (2007) note that allowing the shop floor workers to have a say in decision making, could facilitate the flow of activities within an operational system. Iyang (2011) supports this argument in his/her research on human resource practice in Nigeria, noting that empowering organisation members would support their optimum contributions towards the success of the operational success, empowering them to build self-confidence on the job and enhance their interest in meeting set operational objectives. While such flexibilities could make it easier for the operational system to effectively respond to customers' needs, Organisation A tended to hold on with autocratic approach that offer minimum freedom from command

and control by the superior officers across their operational structure. It is therefore useful as a medium of controlling the organisational remembers (see, Ogowewo, 2005; Hines et al, 2008; Seddon, 2003).

Although these authors based their research on the service sector where humans are the main point of focus rather than the production industry which deals with both humans and materials, the continual development of SLI practice could yield in the near future. A holistic effectiveness in the operational process of the practicing organisations could result in an all-round productivity in areas such as beating down inventory holding costs and other types of waste -e.g. stock out cost, storage cost (see, Radnor et al, 2012). Stock out cost of inventory is the cost incurred for keeping inadequate inventory needed to meet operational demands. It can lead to effects like idle time, malnutrition of live-stock, and eventual poor quality products offered to the market, in the case of Organisation A.

Storage cost is the cost of keeping massive inventory to be able to meet operational demands. Among the associated cost in this form are security, space and preservation (see, Slack et al, 2007).

A significant challenge to the practice of SLI was the inherent rigidity of boundaries among different positions within the operational structure of Organisation A, which proved difficult in aligning the flow of activities. This was due to the issues of unwillingness at some points, by some organisation members to participate in joint development of ideas on the operational process, as well as some of the external stakeholders, wishing to participate in isolation.

6.5 Conclusion

This chapter focused on the discussion on the findings presented in the previous chapter and the impacts of the implementation of Systemic Lean Intervention in Organisation A. Central to the argument of this chapter is the proposition of SLI. This approach highlighted the importance of a wider stakeholders' involvement in the implementation of Lean and Systems tools applied in this research. It took cognisance of the effects and the challenges encountered in the intervention process. A significant observation made in this chapter is the fact that although Lean and Systems authors may seek immediate implementation of changes in an operational process to enhance the achievement of set objectives, the findings from this intervention showed that the involvement of stakeholders may tend to create a significant impairment to this in terms of delays in deliberation and conviction, but the end effect would ensure a 'systemic' acceptance of the chosen change approach by the affected stakeholders.

 The next chapter will present a conclusive account of the entire research work, highlighting the main findings and how they address the research questions. It would also present areas of limitation of this work, as well as suggestions for further research that could enhance further development of the topic, especially in the coverage of Niger Delta region of Nigeria.

7 Chapter Seven: Conclusion

7.1 Introduction

This chapter presents a conclusive write up on the entire research work, in line with the main research questions framed in this research. It discusses a summary of the high points of the research process, covering the methodology and approaches applied as well as the key findings and contributions of the research and thesis.

The structure of this chapter is as follows. Section 7.2 presents summary of the research process, detailing on the key findings based on the main questions set for this research. This is followed by section 7.3 which provide a summary of the contributions to academic debate and managerial implications of the findings. Section7.4 brings out the challenges related to the application SLI in this research context 7.5 presents a summary on the main limitations of this research and 7.6 discusses suggestions for future research.

7.2 Summary of the research process

This research was set out to address the need for effective approach/es to process improvement by utilising effective stakeholders' relationship management in the food production industry, focusing on the Niger Delta region of Nigeria. The research focused on Lean and its application with Systems Thinking. While Lean tended to involve only stakeholders who were directly involved with an operational system (such as the input suppliers, the organisation members), by identifying and eradicating waste, and satisfying the end customers (Womack et al, 1990; Bhasin and Burcher, 2006; Arlbjorn et al, 2011; Bhasin, 2011). This use of Lean among practitioners and researcher has been observed to cause end-to-end negative effects to the affected stakeholders due to its failure to consider the wider impacts of its approaches on these stakeholders and environment. This research applied

Lean, attempting to address the issue of end to end effects of Lean practice which tends to impact negatively on some of the affected stakeholders, who may not be directly involved with the immediate operational process.

The research Lean with the Systems Thinking, projecting to recognise the different parts that an operational systems, noting the interrelationships that underpin the whole operational process (Checkland, 1981; Jackson 2000; 2003). The combination of these models in this research process (Lean and Systems) through the proposed 'Systemic Lean Intervention' (SLI), was to effectively address business operational complexities that may need more than a single approach due to the connectivity between different parts of an operational system and emerging issues in their operations (see, Gregory, 2007; Seddon and Caulkin, 2007; Seddon, 2008). In clear terms, the combination of Lean and Systems served to provide a wider stakeholders' perspective that would be more effective in addressing both the internal organisational challenges as well as the wider environmental issues- involving the identified stakeholders.

 The research was set to answer to three questions and two more specific questions, which were answered as part of the main questions follows:

- *How could Lean and Systems approaches be applied together in order to improve organisational processes in the food production industry in Nigeria?*
- *Is there value in extending the theory and practice of stakeholder involvement in Lean via systems methodology?*

These questions were addressed by proposing Systemic Lean Intervention (SLI) as a combination Lean and Systems. SLI involved the identification of different stakeholders to the research process, the combination of Lean and Systems tools to address those issues that

were identified by the stakeholders. Lean tools applied included waste identification and process improvement workshops – used for further deliberation on identified issues with the concerned stakeholders, and value stream mapping, which helped to develop proper understanding of the operational structure of the organisation. From the Systems side, tools applied includes boundary critique, which was applied alongside CATWOE to identify the research issues of interest, concerned stakeholders and set the foundation for the usage of other tools. Also at different points during workshop sessions, the use of rich pictures boosted the participants' interest in the discussion. These Lean and Systems tools were applied on complementary basis in the research process leading to significant benefits to the operational system, addressing environmental issues as well as the internal operational challenges.

The application of Lean and Systems tools in the research process culminated into significant improvements in the forms of joint development of value improvement strategies with the concerned stakeholders for each of the departments, and considering the impacts of developed changes on other parts of the entire system, avoiding negative end-to-end effects). For instance, the suggestion for the development of biogas electricity from current poultry waste addressed the issue of pollution to the host communities. Also, the decision to cultivate own farm on input materials (e.g. maize) and sourcing some of these materials from host community farmers, addressed the issues of scarcity, delays in arrival and poor quality live-stock feed processed. Although this research field work was concluded before changes started taking place, it is noted that efforts were made to implement the agreed suggestions advanced from the research process. This is however subject to top management's modification based on certain factors such as the resource availability, time, and their overall perception about the various suggestions for change and improvement.

- *How can the philosophy of Lean be enhanced with the use of Systems approaches to address systemic issues within and beyond the organization in focus?*

- *Can boundary critique add value to Lean?*

These questions were addressed via the productive use of Systems tools such as boundary critique which ensured that the right issues were discussed with the affected participants. CATWOE was useful in ensuring that the concerned stakeholders were involved at each point.

Finally, rich pictures facilitated the participants' interest to the research process. The research process was also facilitated with the use of different data collection methods, ranging from personal interviews, workshops and participants observation methods.

Personal interviews set the stage for boundary setting, via grouping of stakeholders based on factors, such as the vested interest, status and the issues identified (see, Figure 5.1). However, the set boundaries were subject to changes due to changes in these factors. The findings of this research also corroborate the argument of authors (Yolles, 2001; 2007; Midgley et al, 2007; Midgley et al, 2013), that there cannot be a permanent boundary in a complex intervention rather, the interveners would need to accept the responsibility to adjust or reset boundaries based on the impact of the influencing factors on set boundaries. For instance, certain participants were observed to decline to comments on certain operational issues due to the lack of knowledge of what sanctions could emerge from their contributions. This challenge was fixed by the effective use of boundary tools, ensuring that the confidentiality of the participants' were preserved and that the compatibility of the participants' status was considered.

Similarly, the use of set boundaries opened the way for the application of Lean tools. For instance, value stream mapping provided a medium for detailed understanding of the flow of

operational activities in Organisation A.   However, the research process was subject to emerging issues that determined set boundaries as well as modifications to ensure adequate compliance to the wish of participants in the research process.   For example, the host community representatives kept declining to have a meeting with the top management on identified issues. They rather met the researcher separately in either personal interviews or in a workshop session.   Similarly, there were instances whereby some internal organisation members declined to comment or participate in workshop or interviews due to the fear of what actions might be taken against them by the top management, even though their purported contribution were not to hurt anyone's interest. The application of flexibilities of boundaries in this research process was in conformity with the Business school's research ethics that guided this work.

7.3   Contributions to Academic Debate

Systems tools were applied to facilitate the implementation of Lean on a systemic basis. The main academic contribution of this thesis is that it proposes SLI as the main approach through which Lean interventions and change can occur, while taking into cognisance of the effects of such changes on the concerned stakeholders.   SLI comes to the foreground from the combination of Lean with Systems approaches to interventions. The effectiveness of Lean in the intervention is enhanced by the use of the above tools in a compounded approach – the SLI. This gave the research process a more resilient force to establish effectiveness in the entire operational process of Organisation A.   The various SLI tools, stemming from combining Lean and Systems tools, served the purpose of having a unified research process, addressing different issues and involving different stakeholders at each stage and resulting in benefits such as the identification of operational waste in the operational process and the joint development of process improvement solutions within the operational structure of

Organisation A. It also led to addressing other external stakeholders' issues affecting their operations. For example, the joint suggestion and decision to develop biogas electricity from current wet live-stock dung is expected to also address the issue of pollution to the host communities, and even provide solution to the challenge of inadequate power supply.

Systemic Lean Intervention contributes to the identification of operational issues and development of improvements via the involvement of the affected stakeholders. It reinforces learning across boundaries in the research process, involving Lean, Systems and the concerned Stakeholders identified (see, Jackson, 1991; 2003; Gregory, 1992; 1996; Midgley, 1997b; 2000; Papadopoulos et al, 2011). SLI, anchored on boundary critique, results in the development of further values from earlier identified operational waste and at the same time address other stakeholder issues in the research process (see, Midgley 2000; Ufua et al, 2014). It created a platform for projecting the intervention to zero waste practice instead of mere identification and elimination emphasised in Lean practice.

Systemic Lean Intervention created a platform for a clearer view of the boundaries, creating a valuable access to more relevant information about the interest and wishes of the concerned stakeholders, needed for successful intervention process anchored on the support and acceptance of those involved. It focused the research process on relationships between the organisation and the stakeholders as well as enabled a critical evaluation of the end-to-end effects of decisions and actions taken in the research process, by considering the effects on these stakeholders. SLI, therefore gave due preference to these stakeholders' perspectives and assumptions which shaped their relationship boundaries with the operational system of Organisation A.

Furthermore, the complementary usage of these tools – from Lean and Systems substantiate the claim of researchers (e.g. Midgley, 1997a, 2000; 2011; Cordoba and Midgley, 2006), on the combination of different tools and methods in an intervention to bring about a change. This observation also affirms the suggestion of authors (e.g. Midgley, 2000; Checkland and Poulter, 2006), who suggest the need for the researchers' skilful participation instead of acting as an external expert in a research process, to enhance a purposeful intervention process.

However rich pictures, as one of the tools applied within the proposed SLI could only be used as a supportive tool and could not be applied independently. Rich pictures required the skilful application of the researcher at different stages of the research process. This observation raises the question about the usage of rich pictures, as an SSM method, suggested and applied by authors (e.g. Checkland, 1981; Chekland and Scholes, 1990; Bronte-Stewart, 1999; Venters et al, 2003; Checkland and Poulter, 2006; Stanton and Mcllory, 2012), whether it can be applied as an independent method in a research process? This is not to suggest that the usage of rich pictures has been under rated or wrongly applied among researchers. Cristancho et al (2015) have attempted to do this in their research in medical science background, however this needs to be extended to social and organisational research, where rich pictures seem to thrive, including developing countries, such as the Niger Delta region where this research was based. An affirmative answer to this question could further enhance its potency in systems theory, prompting the development of new learning about the application of rich pictures, especially on the enhancement of emerging operational practices, such as the SLI.

7.4   Contributions to Managerial practice

The combination of Lean and Systems tools offers practitioners the opportunity to have a holistic understanding of the flow of activities and process within Organisation A, and triggered the joint development of better approaches to addressing identified issues, which commanded the acceptance and support of the affected stakeholders. This occurred via engagement with the organisation members and external stakeholders. It created a medium for positive changes, resulting to an all-inclusive flexibility that would promote effective operational process acknowledged by those involved.   These initiatives projected in SLI could possibly lead to a positive spread of its application transformational approach in place of the current autocratic approach (observed in Organisation A), in the Niger Delta region for further development in the future.   However, it was noted that the findings of this research (see chapter four, five and six), tend to suggest that it would take time to effectively take full effect.

Furthermore, the application of SLI underlines the need for managers to shift away from autocratic approach to a more transformational approach to leadership that could facilitate stakeholders' participation at all levels of its operational structure.   Hence, it is speculated here that the popularity of SLI among managers would depend on their willingness to embrace the needed flexibility in their leadership and adopt changes which are by those stakeholders who are directly affected. This could enhance their commitment to the success of SLI among practicing organisations, and promote an all-round discipline among participants (both within and outside the organisation), via informed work force and partners, who act in various forms to actualise operational goals and meet the expectations of the affected stakeholders.

7.5   Challenges related to the application of Systemic Lean Intervention

The application of SLI faced different challenges. These includes the challenge of inadequate basic infrastructure (e.g. bad roads network, security challenges). As observed in this research process, paying attention to all stakeholders might lead to delays that may result to further issues. This was due to the involvement of different stakeholders and delicateness surrounding the operations of Organisation A used in the research. Delays sometimes posed significant threat to some critical decisions that can result in high risk with the live-stock.

Another challenge to SLI implementation was the issue with the implementation of developed change decisions. The authorisation to effect the implementation tended to rest more with the top management. This was found to constitute a bottleneck issue as the top management could refuse implementation of some SLI changes developed in the research process. For instance, the top management's refusal to implement the proposal to source input materials from host community farmers due to lack of trust, or top management holding the final authorization to implementation.

Finally, although SLI was effectively applied in this research process, it should be noted that certain emerging issues influenced the research process. For example, set boundaries at various stages of the research were subject to amendments due to emerging factors such as changes in the status assumed by participants, (e.g. customers becoming owners), argument among participants during discussions and time limits etc. These issues were addressed via the involvement of a wider range of participants, and asking the top management to let the shop floor staff (the middle managers and supervisors), be involved in implementation process to speed up the process of change.

A significant gap addressed with this application of stakeholder involvement in the research process is the participatory approach that transcends the internal organisational structure and its external environments. This lent full support to systemic development of solution to identified issues by those who are directly affected. It also offered the consideration of an all-round effect of the suggested SLI changes on the concerned stakeholders in the research process. It also offered support to the Lean and Systems change implementation process by the stakeholders.

- The final third research question: *What are the challenges associated with this use, and what do these suggest by way of further research?*

These were addressed the next section- covering the limitations and suggestions for further research.

7.6

7.7   Limitations and suggestions for further research

Time limitation in this research prevented the researcher to see the long-term effects SLI impacts. While this constituted a limitation to this study, future research could explore the long-term impacts of SLI. This would engender learning on the possibility of adaptability of Lean and Systems models among organisations in the food production industry in the Niger Delta region, where this work was carried out.

There is also a need for SLI managers, especially those in a developing economy such as Nigeria to consider projecting further learning of the usage of SLI tools (e.g. rich picture and process maps), in their operations, especially among the shop floor staff (i.e. junior staff for Organisation A). Although in Organisation A, junior staff were less literate, learning SLI

practices can be initiated through an on-the-job learning process, which could train them in the use of these tools, and set the stage for a positive change in the organisation's culture (see, Nonaka and Takeuchi, 1995; Rowley, 2000; Martins and Terblanche, 2003; Nonaka and Toyama, 2003; Carlos Pinho et al, 2014; Benjamin, 2015).

Similarly, the suggested methodology (SLI) was useful in this research process, it addressed vital issues between the organisation and its stakeholders, in line with the context of the environment where organisation A operates. However, it would be in order in the future, to adopt SLI approach/es in different environmental contexts, other than that of the Niger Delta region. This would expose the application of SLI to different cases and projects, other than the one adopted in this research, and different participants with diverse worldviews, exposure, and expectations. It could consolidate on the viability of SLI in qualitative research and also engender further learning on its effectiveness and also facilitate further popularity and development of its approaches among researchers.

Another limitation to the research is that, in the case study organization, the changes suggested tended to depend on the discretion of the top management who have the final authorisation due to factors such as the availability of resources, organisational policy guidelines etc. This finding therefore expresses the glaring leadership issues in Organisation A, which posed a challenge to effective SLI process. This would necessitate further research on SLI development to focus on the impacts of an organisational leadership approach on its progress. Such could help unravel the level to which an organisational leadership can frame their leadership approach/es to suit SLI implementation and also point out the challenges that may be involved.

This research could not view the impacts of employees' motivation policies on the Lean and Systems implementation in the research process and this could be viewed as a weakness to this research findings. This was due to factors such as the unwillingness of the participants to respond to this aspect of the research process. Future research could therefore explore this area in the light of SLI among organisations in the Niger Delta region for the furtherance of an all- round development and adaptability of SLI among practitioners in the region and beyond, especially the food production industry that is paramount to the progress of the national economy.

This work did not focus on areas such as the Legal systems and Lean practice among organisations, which could have opened up learning about the support of the legal process to the success of Lean and System. For instance, it was observed that the top management of Organisation A had to give critical consideration to the slow pace of the legal process in the Nigerian economy, in the making of certain relevant operational decisions. This was due to the wider speculation of weak judicial systems of coverage that may result in delays in the administration of justice, high cost of litigation, and inadequate infrastructural support for the judicial systems (see, Okogbule, 2005; Odeku and Animashaun, 2012). Oko (2005) outlines the importance of a fair judicial system run by impartial judges, saddled with the authorisation to enforce equitable access to justice, and free from interference of other government functionaries, and would offer the support to a reliable judiciary. S/he notes further that such provisions and effective government support would encourage better business practice both in the public and private sectors in Nigeria. It would therefore be recommended for further SLI research in the context of the Niger Delta region to explore the impacts of Legal process in support SLI practice within the region, seeking to find what the issues are and those involved, and how they can best be resolved to enhance better support

for successful SLI in the region. Hence, it is intended to provide food for thought to both Lean and Systems academics and practitioners for the further adoption of SLI. Possible focus on this could be based on internal structural fortification among organisations aimed at having a resilient operational process (e.g. having streamlined employment policies, better training and reward polices), for effective SLI practice.

Finally, some participants who responded to the evaluation questionnaire, noted that some of the issues should have been expressed in quantitative terms for easier understanding and better decisions. They expressed the thought that numerical data could have helped to give evidence of the scale of problems, difficulties and challenges to complement the qualitative approach used. While this observation did not prove any significant limitation to this research findings, it is viewed with the need to draw the attention of future researchers to consider the use of SLI in combination with quantitative approaches, especially in the private sector where majority of activities are quantified. This could offer a more balanced accreditation to the use of SLI among researchers and provide an access to more reliable research solutions to complex business challenges that may not always come in qualitative form. It would also be important for SLI to be applied in other contexts other than those in the Niger Delta region, especially in the developed world where Lean was popularised, to enhance all- round development of its approaches. Such application would promote its development among researchers and practitioners as an approach for process improvement and organisational efficiency.

Appendix i

Presented here is a copy of the consent form obtained from the University, with which the case study organisation approved the conduct of the research field work.

UNIVERSITY OF Hull

Business School

Research Ethics Committee

Consent Form for the Case Study organisation

I,………………………………………………………………………………………………………

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Position Held**………………………………………………………………………………………**

Hereby grant the permission to conduct your research study in my / our Organisation

Under the following conditions:

- I understand that the purpose of the research is to complete your thesis

- The aims, methods, and anticipated benefits, as well as the process of the research study have been explained to me.

- I voluntarily and freely give my consent for the institution/Organisation to participate in the above research study.

- I am free to withdraw my consent at any time during the study, in which event, participation in the research study will immediately cease and any information obtained through this institution or organisation will not be used if I so requested.

- I understand that case studies will be used for research purposes and may be reported in scientific and academic journals, non -academic journal and the internet.

- That your Organisation MAY NOT be named in the research publications or other publicity without prior agreement.

I /We Do/Do Not require an opportunity to check the factual accuracy of the research findings related to the institution/ organisation.

Signature:…………………..   Date:………………….

Contact details of the researcher are:

Amy Cowling, HUBS research ethics committee, Hull University Business Scholl, University of Hull, Cottingham Road, Hull, HU6 7RX. Email: a.cowling@hull.ac.uk. Tel:+441482463410

Appendix ii

Initial personal interview questions for gathering initial boundary setting data in this research.

1. How long has your organisation been in this industry?

2. Can you describe the main features of your operations (e.g. your products)?

3. (A) Who are those involved?

(b) Can you give further description of your relationships with these people/ organisations?

4. (a) Can you describe some of the main challenges you encounter in your operational process?

(b) Are there other specific people or organisations involved in; or affected by these challenges?

(c) In your opinion, what might be there solution/s to these challenges?

(d) Do you think anyone might have different view/s If so who and why?

6. Are there challenges that you face here in Niger Delta that you might not encounter in other parts of the country? What are they?

Appendix iii

A draft of initial personal Interview questions with the concerned stakeholders

1. What is your relationship with this organisation?

2. How long have you been in this relationship?

3. (a) Can you describe how you are affected by their current operational process?

(b)Can you describe how your activities affect them?

(c) Can you site some examples of this involvement, and what the consequences are?

4. (a) Has you/your group ever had a reason to ask the management to change or modify their operational system to address certain issues of interest?

(b) Can you give further details of such important requests?

5. Do you have any examples of working successfully with the management?

6. (a) Are there challenges in your relationship with the management?

(b) Please if yes, can you give further details on such challenges?

(c) Were they resolved?

(d) If no, what do you think can be done to address these challenges?

7. (a) How does your relationship with this organisation affect others who also interact with the organisation?

(b) Will you/ your group be happy to discuss together with other people about your relationship with this organisation?

(c) If no, can you please explain why?

Presented here is a copy of the consent form obtained from the University, with which the individual participants at the workshop consented to participate in the research process.

UNIVERSITY OF Hull
Hull University Business School

Research Ethics Committee

Consent Form for Workshop participants

I,…………………………………………………………………………………………

………………………………………………………………………………………..

Hereby agree to participate in this workshop, to be undertaken by:

UFUA DANIEL EBAKOLEAH.

I agree to participate under the following conditions:

- I understand that the purpose is to meet the requirement for the completion of your thesis

- I am aware that my personal identities would be held in anonymity.

- That all information would be recorded for use in the research and afterwards, be destroyed.

- That a written summary report from the workshop may be presented to management of the organisation.

- Aggregated results will be used for research purposes and may be published in scientific and academic journals (including online publications).

- Individual results **will not** be released to any person, except at my request and my authorisation.

- That I am free to withdraw my consent at any time during the study in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

Signature:……………………   Date…………..

Contact details of the researcher are:

Amy Cowling, HUBS research ethics committee, Hull University Business Scholl, University of Hull, Cottingham Road, Hull, HU6 7RX. Email: a.cowling@hull.ac.uk. Tel:+441482463410

Presented here is a copy of the consent form obtained from the University, with which the interview respondents consented to participate in the research interviews.

Research Ethics Committee

Consent Form for Personal Interview Respondents

I,…………………………………………………………………………………

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Hereby agree to participate in this interview, to be undertaken by:

UFUA DANIEL EBAKOLEAH.

I agree to participate under the following conditions:

- I understand that the purpose is to meet the requirement for the completion of your thesis

- I am aware that my personal identities would be held in anonymity.

- That all information would be recorded for use in the research and afterwards, be destroyed.

- Aggregated results will be used for research purposes and may be published in scientific and academic journals (including online publications).

- Individual results **will not** be released to any person, except at my request and my authorisation.

- That I am free to withdraw my consent at any time during the study in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

Signature:…………………… Date…………..

Contact details of the researcher are:

Amy Cowling, HUBS research ethics committee, Hull University Business Scholl, University of Hull, Cottingham Road, Hull, HU6 7RX. Email: a.cowling@hull.ac.uk. Tel: +441482463410

Appendix vi

The evaluation questionnaire used in the research process:

University of Hull Business School

United Kingdom

EVALUATION QUESTIONNAIRE

Answers to this questionnaire will be used to evaluate the strengths and weaknesses of the methods we have used in the workshop/s. While your consent to answer these questions is solicited, all your personal identification details are completely held in anonymity.

Section 1- Usefulness of Workshop/s

1.1a. How useful was this workshop/s for you? Please tick appropriately

Not at all useful (   )   Not so useful (   )   Neutral (   ) Fairly useful (   )   Very useful (   )

1.1b. In what ways? (*Please comment*)

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1.2. What can you describe as the best feature/s of the workshop session/s?

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1.3. What could you say was the least feature/s about the workshop session/s

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1.4. What could have been done differently?

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Section 2- Purpose Achieved by the Workshop/s

Please help the researcher to understand what purposes were achieved in this workshop/s by answering the following questions:

To what extent was the workshop/s in helping you to...... (*Please tick appropriately)*

2.1. Put forward ideas for discussion?

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.2. Recognise that there are many different points of view

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.3. Gain a better ideas of possible options for tackling

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.4. Change your mind on what ought to be done about

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.5. Learn more about the issues surrounding the topic/s

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.6. Challenge your previous way of thinking about the topic/s

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.7. Focus on what was really important

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.8. Have confidence that the outputs generated by the workshop/s will make a difference

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.9. Think more clearly about positive and possible changes

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

SECTION 3 Negative aspects of the workshop/s

To what extent do you agree or disagree with the following statements?

3.1**.** The purposes of the workshop/s were clear

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.2. What was expected from me during the workshop/s was not clear

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.3. There was too much talk

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.4. Workshop/s discussions were free and open

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.5. Issues of (subject of the workshop) were made more complex than they actually are

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.6a. This workshop/s was different from my previous experiences with workshops

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.6b. If you ticked "Strongly agree" or "Agree", please explain why

....

....

....

3.7. My views were not listened to

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.8. People work well in a team

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.9. I had sufficient information to take part in workshop/s discussions

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.10. There were issues that could not be discussed

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.11. My "cultural" view points were acknowledged by others within the workshop

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.12. I felt pressured to agree with the group

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.13a. Significant issue(s) were missed in workshop discussions

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.13b. If you ticked either "Strongly agree" or "Agree", please describe the issue(s)

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SECTION 4- Cultural perspective

4.1. From the "cultural" perspective what were the strength of this workshop approach?

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4.2. What were the drawbacks?

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4.3. What things would you such as to have seen done differently to better incorporate

different cultural perspectives (in general, or in relation to your specific cultures)?

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SECTION 5-

Please indicate by ticking appropriately which category applies to you

5.1. I participated in the:

(a)   Top management group ( )

(b) Middle managers, senior staff and supervisors group ( )

(c)   Junior staff group ( )

(d) Host community farmers and representative group ( )

(e)   Concerned government agency group ( )

(f)   Input suppliers group ( )

(g) Customers ( )

Appendix vii

The evaluation questionnaire used in the research process:

University of Hull Business School

England

EVALUATION QUESTIONNAIRE

Answers to this questionnaire will be used to evaluate the strengths and weaknesses of the methods we have used in the interview session/s. While your consent to answer these questions is solicited, all your personal identification details are completely held in anonymity.

Section 1- Usefulness of Interview sessions

1.1a. How useful was this interview session/s for you? Please tick appropriately

Not at all useful (   )   Not so useful (   )   Neutral (   ) Fairly useful (   )   Very useful (   )

1.1b. In what ways? (*Please comment*)

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1.2. What can you describe as the best feature/s of the interview session/s?

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1.3. What could you say was the least feature/s about the interview session/s?

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1.4. What could have been done differently?

....

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....

....

Section 2- Purpose Achieved by the Interview session/s

Please help the researcher to understand what purposes were achieved in this interview session/s by answering the following questions:

To what extent was the interview session/s in helping you to........ (*Please tick appropriately)*

2.1. Put forward ideas for discussion?

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.2. Recognise that there are many different points of view

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.3. Gain a better ideas of possible options for tackling

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.4. Learn more about the issues surrounding the topic/s

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.5. Focus on what was really important

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.6. Have confidence that the outputs generated by the interview session/s will make a difference

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

2.7. Think more clearly about positive and possible changes

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

SECTION 3 Negative aspects of the interview session/s

To what extent do you agree or disagree with the following statements?

3.1**.** The purposes of the interview session/s were clear

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Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.2. What was expected from me during the interview session/s was not clear

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.3. There was too much talk

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.4. Interview session/s discussions considered my confidentiality

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.5. Issues of (subject of the interview session/s) were made more complex than they actually are

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.6a. The interview session/s was different from my previous experiences with interview session/s

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.6b. If you ticked "Strongly agree" or "Agree", please explain why

....

....

....

3.7. I had sufficient information to take part in interview session/s discussions

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.8 My "cultural" viewpoints were acknowledged by others within the interview session/s

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.9a. Significant issue(s) were missed in interview session/s discussions

Strongly agree ( )   Agree ( )   Neutral ( )   Disagree ( )   Strongly disagree ( )

3.9b. If you ticked either "Strongly agree" or "Agree", please describe the issue(s)

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....

SECTION 4- Cultural perspective

4.1. From the "cultural" perspective what were the strength of this interview session/s approach?

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4.2. What were the drawbacks?

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4.3. What things would you suggest to have seen done differently to better incorporate different cultural perspectives (in general, or in relation to your specific cultures)?

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SECTION 5-

Please indicate by ticking appropriately which category applies to you

5.1. I participated in the:

(a) Top management group ( )

(b) Middle managers, senior staff and supervisors group ( )

(c) Junior staff group ( )

(d) Host community farmers and representative group ( )

(e) Concerned government agency group ( )

(f) Input suppliers group ( )

(g) Customers ( )

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