An evaluation of Global Management Accounting Principles in the sustainability of a mechanised piggery

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ABSTRACT

TITLE: An evaluation of Global Management Accounting Principles in the sustainability of a mechanised piggery.

KEYWORDS: Management accounting, commercial farming, sustainability, global management accounting principles.

Commercial farming forms the backbone of food security in most countries and specifically in South Africa. Moreover, it is evident that agriculture is still an important source of employment in the South African economy. The agricultural industry globally, but specifically in South Africa, is facing many influential factors over which little or no control can be exerted. These influential factors or complexities have an impact on sustainability of commercial farming operations. The sustainability of commercial farming in South Africa requires a fresh look at available tools to steer through uncertainty and instability. The internal management and business decision-making processes of commercial farming operations should firstly be considered.

The importance of sound business decision-making was recently highlighted by the joint venture between the Chartered Institute of Management Accountants (CIMA) and the American Institute of CPAs (AICPA) in that quality decision-making has never been more important – or more difficult. It is argued that management accounting has a role to play in improving business conduct. This is equally relevant for commercial farming operations. In 2014, CIMA and AICPA published the first set of Global Management Accounting Principles (GMAPs) to provide guidance on best practice for management accounting functions. GMAPs take the combination of appropriately skilled people and four core principles, within a functioning performance system, and apply it over fourteen (14) practice areas to describe what a management accounting function should provide for sustainable success.

The main objective of this study was to evaluate the relevance of GMAPs in the sustainability of a mechanised piggery in a South African context. The research design, therefore, took the form of case study research with a combination of exploratory and contextual applied research with an inductivist approach to qualitative research.

The object of the study is a commercial farming operation in South Africa that has a focus on pork production, Piggery A. Piggery A is a sole proprietor type business entity, managed and owned by Owner-A.

The study made use of the concept of business sustainability as a lens through which GMAPs were evaluated in the case of Piggery A. CIMA and AICPA published a diagnostic checklist to assist organisations in assessing the contribution that their management accounting functions are making towards sustainable success. This checklist formed the foundation of the evaluation of GMAPs in the sustainability of Piggery A.

Data collection techniques included the observation of the farming operation during a field visit, as well as a predetermined set of questions that were used within a semi-structured approach to face-to-face interviews.

The study found that, without pre-knowledge of GMAPs, Piggery A employed a large number of the concepts and principles described by GMAPs as best practice. Combined with the assessment that the farming operation itself was physically sustainable, it could be concluded that GMAPs assisted with the sustainability of Piggery A and the decision-making processes of Owner-A.

However, despite the strong presence of principles of GMAPs within Piggery A, it was still decided to discontinue the pork production part of the commercial farming operation, due to external factors beyond the control of Piggery A's management. This discovery brought about two questions that remain unanswered: firstly, whether or not GMAPs could have assisted Owner-A with steering clear of this definitive decision by providing the information more timely, with strategic options to turn the profitability of Piggery A around; and secondly, whether or not GMAPs could have informed the decision earlier on, with strategic alternative options to consider for cash generating activities which could harness the infrastructure, already in place, to avoid the prolonged period of internal losses.

Notwithstanding this, namely that GMAPs were found in practice in Piggery A, a sole proprietor, supporting its sustainability, it could be generalised that GMAPs would be applicable to more complex business forms such as companies, trusts or closed corporations. It is therefore recommended, based on the finding of this study, that all

commercial farming operations consider GMAPs as a tool to establish best practice in the support of decision-making, which would promote sustainability of farming operations.

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CHAPTER 1

1 INTRODUCTION

1.1 Background

Commercial farming forms the backbone of food security in most countries, especially in South Africa. Moreover, it is evident that agriculture is still an important source of employment in the South African economy, where more than 5% of total employment is provided within the agricultural, hunting, forestry and fishing sectors (DAFF, 2015). The agricultural industry globally, but specifically in South Africa, is besieged by complexities which include matters of i) mechanisation (Saayman & Middelberg, 2014; Gan-Mor *et al.*, 2007), ii) taxation (Darroch *et al.*, 2008)), iii) political influences (Agri SA, 2015; Anon, 2015a; Anon, 2015b; Anon, 2015c; Mokhema, 2015; Nkosi, 2015) and iv) market related forces (Anon, 2015a; Anon, 2015b; Anon, 2015c; Hamilton, 2006).

Agriculture has, over the millennia, continued to evolve by means of **mechanisation** as well as scientific improvements in methodologies. As far back as 1975, Hopkin (1975) highlighted that the environment in which agriculture operates, was changing. Hopkin (1975) further pointed out that the appraisal of land value is influenced by a range of factors. One of the six factors that he identified was about changes in technology, which involve, amongst others, mechanisation. The other five factors mentioned were i) the way capital structures change within agriculture; ii) changes in the market - which will be discussed later in this section; iii) energy awareness; iv) the involvement by governments - which will be discussed later in this section, and v) inflation.

Hopkin (1975), at that time, was concerned that agriculture could be on the verge of running out of new technology. This was, however, proven wrong by the continued influx of new technologies in mechanisation - such as the use of global positioning systems (GPS) to guide tractors in automated row-crop operations (Gan-Mor *et al.*, 2007). It was furthermore recently proven that South African grain producers are very well mechanised, to such an extent that a 51% increase in minimum wages had little effect on the grain industry's strife towards further mechanisation (Saayman & Middelberg, 2014).

Even **taxation** brings about complexity in the environment in which commercial farms operate. Besides the special attention that the Income Tax Act no 58 of 1962 gives to agriculture in particular, a fairly new economic factor influencing the agricultural environment in the present day is that of municipality tax (Darroch *et al.*, 2008). The new municipal land tax was considered by Darroch *et al*. (2008) to be counterproductive in that the tax reduces current operating returns which, in turn, discourages investment in idle land.

Taxes are derived from **political influences** on a country as a whole. Internationally, farmers are facing political influences to market forces, as was recently the case in France where farmers did not accept the government's proposed plan of action to address the problems farmers are faced with (Anon, 2015a; Anon, 2015b).

The most recent significant political influence on agriculture in South Africa was the increase in minimum wages in 2013. This increase in minimum wages came after a series of violent strikes (Anon, 2015c). Minimum wages in the agricultural sector were introduced after it was found that farm workers were still living in absolute and relative poverty, which necessitated intervention from government to redress the situation (Saayman & Middelberg, 2014; Vink, 2001). This, however, did not have the desired effect, as farming operations henceforth have to find other ways to cut costs. Those ways include, amongst others, reducing the labour force and the number of working hours. A growing number of permanent farm workers are no longer living on the farms (Anon, 2015c).

To add to the unstable undercurrents of the industry, attributed to by minimum wages, it was reported that government was slow in bringing clarity to the important factors that policy development entailed. This, reportedly, had a negative effect on the industry in terms of investment, productivity as well as job-creation (Nkosi, 2015). Nkosi (2015) stated that various studies from different fields concluded that there is an adverse relationship between policy instability, or uncertainty, and economic growth.

Another factor which influences agriculture in South Africa and which might – in some spheres - be seen as political and could be categorised under the environment in which the industry operates in general, is crime. Rural crime has been cited as a

dampening factor on economic development in the agricultural sector (Agri SA, 2015).

However, crime is hardly the only factor that influences the **market**. Globally, farmers are grappling with the low commodity prices that the market is willing to pay. This is evident from protest action by farmers in France, where farmers blockaded roads to exert their frustration (Anon, 2015a). Even though the French government communicated a plan to address the frustration, farmers were not appeased by it (Anon, 2015b). This proves to illustrate the level of pressure that agriculture as an industry is facing in the market, whether there is support from government or not.

Agriculture in South Africa is considered to be in financial stress, due to a number of market related factors such as deregulation of the market, reduced trade tariff protection and the pressure that large international retailers have placed on farming margins (Anon, 2015c). This is supported by the notion that farmers are price takers and not price makers (Davey, 2008; Hamilton, 2006). Commercial farming units have decreased from just under 61 000 units in 1996 to 40 000 units in 2007. In contrast to this, total farming gross income in 1995/96 was recorded to be just under R35 000 million, compared to just over R100 000 million in 2006/7. In 2013/14, gross agricultural income was estimated at R201 000 million. In addition to the growth in value of gross income, farming debt showed a similar expansion - from a mere R20 000 million in 1996 to nearly R117 000 million in total debt in 2014 (DAFF, 2015). This indicates that farms have not only grown in size, both physically and commercially, but also – with the significant growth in debt level - in complexity. This further implies that the need for sound information to make proper business decisions has grown proportionally.

All the factors discussed above prove that commercial farmers are facing many influential factors over which they can exert little or no control. The sustainability of commercial farming in South Africa requires a fresh look at available tools to steer farming through uncertainty and instability. The internal management of commercial farming operations should firstly be considered. Management accounting is concerned with the supply of information to support or assist sound business decision-making (Seal *et al.*, 2012; Needles & Crosson, 2011). Farming operations, as any other business, should be able to master the skill of sound financial

management to ensure sustainability of the operation. Only a small amount of literature on the principles of managing the finances of farming operations was found during the literature study. In contrast to this, many studies in the field of management accounting, including the agricultural sector, advise and apply complex cost allocation methods such as Activity Based Costing (ABC) as a tool to enable sound decision-making (Le Roux, 1982; Bibbey, 1995; Joubert, 1996; Holloway, 2004; Middelberg, 2007; Konan, 2013; Savic *et al.*, 2014; Joubert, 2015).

The importance of sound business decision-making was recently highlighted by the Association of International Certified Professional Accountants (AICPA) - "Quality decision-making has never been more important – or more difficult" (CIMA & AICPA, 2014b). AICPA is a partnership between the American Institute of CPAs and the Chartered Institute of Management Accountants (CIMA) and forms the largest body of management accountants globally (CIMA & AICPA, 2014b). AICPA published the first set of Global Management Accounting Principles© (GMAPs).

GMAPs describe the constituents of an effective management accounting function, including competent people, clear principles and well managed performance applied across 14 practice areas (CIMA, 2015). CIMA and AICPA (2014b) stated the four headline principles of the GMAPs as follows:

1. Communication that provides influential insight;
2. Relevant information;
3. Impact on value is analysed; and
4. Stewardship builds trust.

Communication encompasses questions and discussions that break down compartmental thinking and in turn illuminate strategic issues and customer needs. **Information**, on the other hand includes the identification of past, present and future data, both financial and non-financial, from various sources. Information facilitates robust inquiry. Scenario planning and simulation, as part of analyses of impact on **value**, provide information that identifies i) risk, ii) likelihood of an idea succeeding, and iii) opportunity costs that will aid in the decision-making process. Lastly, every

discussion and action must take place with the highest integrity, with a focus on the long term interest of the organisation and its stakeholders so as to build **trust** (CIMA, 2015).

The relevancy and application of the GMAPs as a conceptual framework can provide a platform for improved decision-making within commercial farming operations.

1.1.1 Literature review of the topic

As mentioned before, in the past management accounting had been stereo-typed in terms of cost accounting and specifically cost allocation. This is evident in the large range of literature that focuses on the implementation of, *inter alia,* activity based costing (ABC) models in various industries and recommendations for the use of ABC and other cost accounting systems for the improvement of decision-making.

Typical to these research studies is discussion of the core elements that make up the principles underlying any ABC model. Although Le Roux's (1982) findings may be relevant to agriculture, they date back to more than 30 years. Le Roux (1982) studied the cost of producing sultana grapes in the Upington area in the Northern Cape province of South Africa. As both the economic and agricultural environment have since changed, the relevance of such a research for today can be questioned.

The other cited literature (Bibbey, 1995; Joubert, 1996; Middelberg, 2007) is about specialised research into a specific business in an industry. This leaves the question whether the models are still used to this day (Joubert, 2015). Furthermore, these studies did not focus on commercial farming operations.

Savic *et al.* (2014) argued that agri-businesses in Serbia should focus on strategic cost management strategies, which rely on strategic cost analysis. They discussed various advanced forms of costing systems such as ABC, Target Costing and Lean Costing, amongst others. All of these systems, however, require various considerations before being selected for use (Savic *et al.*, 2014). The critique against this study is that it did not address the requirements needed for sophisticated cost accounting systems to be successfully implemented. The study only made suggestions towards advanced cost accounting systems, which Konan (2013) found in his study to be problematic due to the complexity of specifically the ABC system.

Notwithstanding, a study conducted by Holloway (2004) that addressed management accounting principles of a black economic empowerment (BEE) project on an apple farm in the Free State, can be considered as closely related to the intended research study. This study by Holloway (2004) considered a workable system revolving around the use of information technology (IT) and management principles. It focussed on the perceived relevance and benefits of the implementation of an IT system and the information that the system produced in relation to management principles. The study indicated that, on average, 73% of the respondents found that the IT system had achieved the overall objective. However, the timing of the study is, similar to the other studies, older than ten years and specifically focussed on an apple farm within the BEE context.

The notion therefore is that research in management accounting is generally different for each case. This is reiterated by Luft and Shields (2003) who stated that, if management accounting had the same effect on all individuals, then there would be no need to consider individuals *per se* in management accounting research. However, the same management accounting often has different effects on different individuals (Luft & Shields, 2003).

1.1.2 Motivation of topic actuality

As mentioned earlier, ABC has been thoroughly researched in the past. This is evident by referring only to a number of studies on the matter since 1982 (Le Roux, 1982; Bibbey, 1995; Joubert, 1996; Holloway, 2004; Middelberg, 2007; Konan, 2013; Savic *et al.*, 2014; Joubert, 2015). However, before any operation can embark on a journey to implement an advanced cost accounting system such as the ABC system, the operation must consider the fundamentals of an ABC system, which would include principles within GMAPs. In support of this, Konan (2013) found that there were four major problems faced by South African companies while implementing an ABC system. The four problems can be summarised as follows:

1. the lack of basic knowledge and skills of ABC techniques by employees;
2. ABC was complex and required too many detailed records;
3. ABC was too time-consuming for the personnel; and

4. There was resistance from employees because they did not exactly know ABC.

These findings are consistent with what one can expect from a system that is described as complex (Drury, 2015).

It is therefore important for any business to take a proverbial step back and observe the foundation that an advanced cost allocation system requires before embarking on a process of implementation. This implies that the business should have a thorough understanding of management accounting principles.

To this end, the GMAPs were published in 2014 and no literature on the subject, specifically applied to commercial agriculture in general or in a specific case, could be found. Smith (2014) stated that the proposed principles are designed to ensure that management accountants provide the right people with the right information at the right time, to ensure that they make the best decisions about their organisation's long-term success.

Smith (2014) further referred to the emergence of countries from the worst recession since the Second World War and highlighted that, when businesses fail, society as a whole suffers. It can be gathered that this is just as relevant to an agricultural business as to any other sector's business. Smith (2014) also referred to internal audit, corporate governance and regulation having a role to play in improving business conduct, but this is equally true about management accounting. A commercial farming operation can therefore also gain as much advantage from management accounting as any other business operation in any other sector. Pork production forms part of commercial agriculture, which contributes to the total envelope of industries within the agricultural sector (DAFF, 2015).

DAFF (2015) recorded the pork production industry as part of the larger animal production segment within the agricultural sector. In 2013/14, the animal production group had an estimated gross value of R96 billion. Pork production grew in gross value from a mere R1 billion in 2001/2 to an estimated R4 billion in 2013/14 (DAFF, 2015). This effectively means that the gross value of pork production increased with 364% over a period of 12 years. The animal production segment grew with 281% in gross value over the same period.

It can therefore be concluded that, as management accounting principles in the form of GMAPs is relevant, so is the production of pork on a commercial scale. Combining these two actual topics against the backdrop of the larger environment in which agriculture operates, would lead to the problem statement.

1.1.3 Case study

The case study which will be used in this research project is a commercial farming operation located in the Kwazulu-Natal province of South Africa. The farm generates cash mainly from a mechanised piggery. The farm, known as Piggery A, is a multi-million Rand family owned operation which supports various families and employs more than 40 seasonal and permanent employees. The farm also produces maize, which is primarily used as feed in the piggery, but also serves as a source of cash generating activity in the sale of the product on the larger South African maize market.

Piggery A is highly mechanised and sophisticated. It has an on-site mill to grind and mix various grains to produce the feed. The latter is mechanically distributed to the various pig stalls to optimally produce weight-gain over the shortest possible period for the pigs that have to be delivered to an abattoir. The pig steads, which house the various stalls, are well designed to form separate work-in-progress production lines: from insemination of sows to pigs awaiting collection for delivery to an abattoir.

The quality of meat, the superior design of the production lines and the intelligent integration of the maize and pork production operations were confirmed by the fact that the operation attracted visitors from both Germany and the United States of America (Owner-A, 2014).

1.2 PROBLEM STATEMENT

Considering the pressure which commercial agriculture in South Africa is experiencing, as well as the growing nature of pork production in this sector, mechanised piggeries would have to consider ways in which to manage their operations in order to remain sustainable.

The primary research problem to be considered is therefore:

P_0: Would management accounting principles, encapsulated by the newly published GMAPs, assist with the sustainability of a mechanised piggery in South Africa?

The following secondary questions will provide direction to the study in the course of seeking the answer to the primary research question:

a) Is there an awareness of the general principles of management accounting as described by GMAPs within Piggery A?

b) Is there an unintended presence of any of the principles within Piggery A on GMAPs?

c) Which GMAPs principle would be the most relevant and important for Piggery A?

1.3 OBJECTIVES

The objectives of the study consist of a main objective and various secondary objectives.

1.3.1 Main Objective

The main objective is to evaluate the relevance of GMAPs in the sustainability of a mechanised piggery.

1.3.2 Secondary Objectives

The secondary objectives supporting the main objective are defined as follows:

- determine and design the appropriate research methodology (chapter 2);
- contextualise GMAPs and the key concept of sustainability from available literature (chapter 3);
- summarise and conclude on the findings from the exploratory case study (chapter 4);

- establishing the basic management accounting need and the corresponding GMAP of the commercial piggery in order to prioritise the deployment of GMAPs from Piggery A's perspective (chapter 4); and
- summarising and concluding the research study (chapter 5).

1.4 RESEARCH DESIGN

The research design consists of a literature review, an empirical study as well as the research paradigm discussion.

1.4.1 Literature review

The purpose of the literature review is to consider the findings of previous research, including academic articles, commercial journal articles and governmental reports to determine the applicability of the identified GMAPs to the case study. The GMAPs will also be correlated with relevant text to provide further context, if applicable.

1.4.2 Empirical research

The empirical research will be in the form of a descriptive case study, as described in section 1.1.3.

Empirical data collection will consist of semi-structured interviews with some of the key stakeholders to Piggery A. Interviews will be conducted with the owner of Piggery A and the professional accountant of the farming operation. The questions will be designed to enable the researcher to perform a gap analysis to determine which elements of GMAPs are already in place at the Piggery A and which elements require consideration.

1.4.3 Paradigmatic assumptions and perspectives

The two common paradigms applicable to this research project forms the out-most ends of the continuum of paradigms, which is positivism and interpretivism (De Villiers & Fouché, 2015). Positivism is based on realist ontology which views the world as being separate or independent from the researcher's knowledge of it (McKerchar, 2008). McKerchar (2008) contrasted interpretivism to positivism in that the researcher cannot be separated from the subjects being studied; this means that the study is based on the subjective interpretation of the researcher. The ontological

position of interpretivism is generally based on realism that sees reality as a personal construction (Geels, 2010).

This study will be embarked on from an interpretivism paradigm due to the nature of the study. From that perspective, the researcher cannot be separated from the data collected and will thus be required to interpret the data. The use of a descriptive case study and semi-structured interviews will support this paradigm from a methological as well as a design perspective respectively.

The applicability and approach of case study research to the research problem will be explored in more detail in chapter 2.

1.5 OVERVIEW

The chapter layout, as well as a high level overview of what is to be achieved in each chapter, can be summarised as follows:

Chapter 1 – Introduction and background to the study

The objective of the chapter is to introduce the study and provide context to the case study.

Chapter 2 – Research methodology

Chapter 2 will focus on the research design and appropriate research methodology.

Chapter 3 – Management accounting principles

This chapter will explore in more detail GMAPs, as published by AICPA, with applicability to the case study as well as to the issue of sustainability as a relevant term for this case study.

Chapter 4 – Empirical case study

The aim of this chapter will be to summarise and conclude on the findings in order to achieve the various objectives set for this research case study.

Chapter 5 – Conclusion

The conclusion will summarise the outcomes of each of the objectives and conclude on whether GMAPs can assist in the sustainability of commercial farming in South Africa, with specific reference to the case of a mechanised piggery. This chapter will also discuss limitations of the case study and will recommend further areas for study from what has been found with this research study.

CHAPTER 2

2 RESEARCH METHODOLOGY

2.1 Introduction

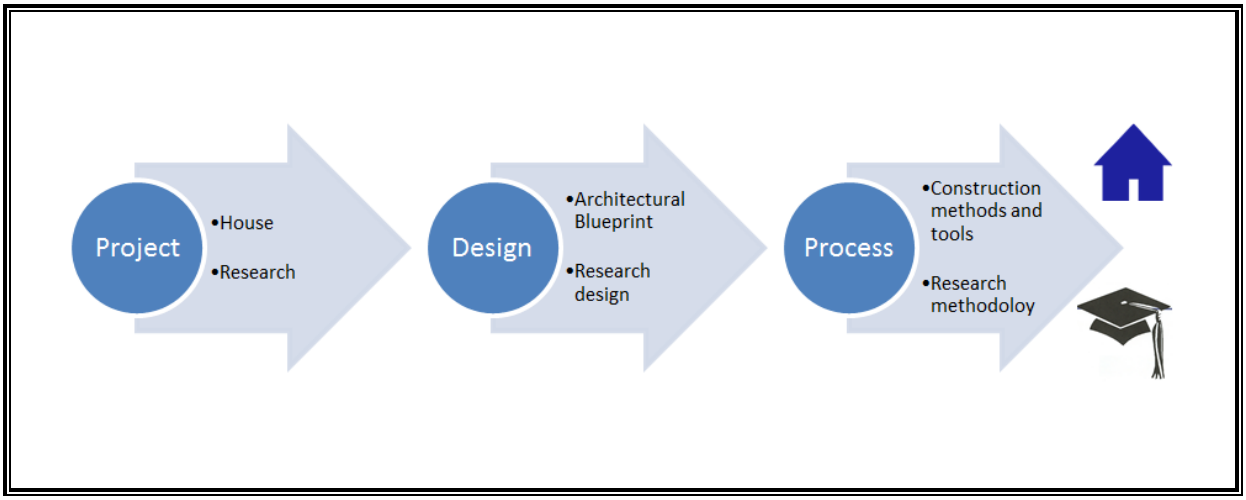
This chapter aims to address the first secondary objective (refer page 9) by providing insight into the research design and methodology required to assist in answering the research question, as well as the motivation behind the selected design. The research question was formulated in chapter one (refer page 9).

Research design in its most elementary sense can be described as the logical sequence that connects the data collected at the empirical stage of the study with the initial research question and the conclusion of the study (Yin, 2009). Mouton (2009) described research design as the plan or the blueprint of how a research project will be conducted, comparing it to the design or blueprint of a house to be built. Research design therefore provides a map that a researcher will use in travelling to reach conclusions (Middelberg, 2011). Research design can thus be seen as the map or plan the researcher uses to logically sequence the project from data collection to conclusion. It is therefore important to choose an appropriate research design to answer the research question.

While research design focuses of the end product, **research methodology** focuses on the research process, including the kind of tools and procedures to be used (Mouton, 2009).

Mouton (2009) summarised the similarities between building a house and conducting a research project as follows (refer Figure 2.1):

Figure 2.1: A metaphor for research design



Source: Adapted from (Mouton, 2009)

Research methodologies and the applicability thereof to this study are further discussed in section 2.2. A case study was chosen as an appropriate research method, since a deeper understanding of the phenomenon is required (Yin, 2009) - in this case being the role of GMAPs in commercial agriculture in South Africa and how the existing framework can be applied to farming operations. The relevancy of GMAPs, as well as the industry chosen for the study, was discussed in Chapter 1 (refer page 6). A single case of a mechanised piggery was chosen since it can be argued that the business form of the operation, being a sole proprietor, is considered the most basic legal form of business. This basic legal business form would therefore provide the most basic elements that would also be found in more complex agriculture business entities. The pork industry was chosen to serve the purposes of the study, because the case study site is openly accessible to the researcher, with full co-operation granted by Owner-A.

The layout of the chapter will be as follows: case based research will be discussed in section 2.3, and the research design for case studies in section 2.4. The limitations of the research method will be discussed in section 2.5, and finally the chapter will be summarised in section 2.6.

2.2 Research methodologies

De Villiers and Fouché (2015) stated that there is more to research than the usual research of quantitative and that of qualitative nature. The researcher must comprehend the philosophical underpinning of the research methodology (De Villiers & Fouché, 2015). Middelberg (2011) cited that it is recommended that researchers be clear about their epistemological (refer page 10) stance. As highlighted in Chapter 1 (refer page 10), this research project requires the researcher to take an interpretivist paradigm that points to qualitative research methodology (De Villiers & Fouché, 2015).

Nieuwenhuis (2014) reasoned that qualitative research is often described as research that collects rich and descriptive data related to a specific phenomenon or occurrence. This is done to develop an understanding of what is being studied (Nieuwenhuis, 2014). Quantitative research, in contrast, is defined as a process of systematic and objective use of numerical data from a limited subgroup of a population to generalise the findings which derived from the universe that was being studied (Maree & Pietersen, 2014).

There are a number of methodologies within qualitative research (Flick, 2008). From among those, Nieuwenhuis (2014) distinguished between conceptual studies, historical studies, action research, case study research, ethnography and grounded theory.

Of these, case study research was deemed the most appropriate for this study. This is because, according to Yin (2009), case study research is the method of empirical inquiry that investigates a modern-day occurrence within its real-life context, especially when the boundaries between the occurrence and the real-life context are not clearly evident. The paradigmatic (refer page 10) stance of the researcher is further supported by case study research, since case studies are preferred as method in the interpretive paradigm where findings can also not always be generalised (Middelberg, 2011).

Case study research will be discussed in section 2.3 in more detail.

2.3 Case study research

Case study research is the study and portrayal of a specific event or events, circumstances and people. There are, however, different forms of and reasons for case study research (Simons, 2009). Researchers have used case study research for many years across various fields or disciplines, all in an effort to answer the "how" and the "why" questions (Nieuwenhuis, 2014).

Although case study research has been strongly associated with qualitative research (Ritchie, 2003), one can - even within case studies - distinguish between three different research types, namely: 1) exploratory, descriptive and explanatory research; 2) applied and basic research, and 3) quantitative and qualitative research (Durrheim, 2002).

2.3.1 Exploratory, descriptive and explanatory research

This type of research is concerned with the goals of the research. **Exploratory studies** are initial or new investigations into subject matter that is relatively unknown (Durrheim, 2002). Consequently, the approach in collecting data is not only less structured, but also aims to explore participants' conceptions which are considered as key (Arthur & Nazroo, 2003).

The goal of **descriptive studies** is to accurately describe unique occurrences or phenomena and it can take on the form of a narrative-type account (Durrheim, 2002).

The aim with **explanatory studies** is to provide underlying explanations of the unique occurrence (Durrheim, 2002). Such explanations presume causal or underlying links to the occurrence, or simply put "how" and "why" something happened (Yin, 2009).

In addition to the three types of studies Durrheim (2002) put forward, the **contextual research** type of study can be considered. This type of research attempts to identify "what" exists in the social world, as well as how it expresses itself (Ritchie, 2003).

This study will take both a **contextual** and **exploratory** approach by evaluating the relevance of GMAPs to Piggery A and exploring the role that GMAPs are, unknowingly, already playing in Piggery A.

2.3.2 Applied and basic research

Basic research produces findings that are used to advance current knowledge of the social world (Durrheim, 2002). Ritchie (2003) described basic research as theoretical research, since it is aimed at challenging existing theories. Durrheim (2002) agreed by indicating that basic research is used to support or challenge knowledge of the world or general theories about how the world operates.

Applied research contrasts with basic research as it produces findings for practical application (Durrheim, 2002). Applied research, therefore, uses knowledge from research to provide an understanding or resolution of a present issue (Ritchie, 2003).

Ritchie (2003) furthermore argued that all research is based on some form of theoretical assumptions, however ambiguous.

This research project can therefore be described as **applied research**, since it seeks a practical application of GMAPs in Piggery A.

2.3.3 Quantitative and qualitative research

The most simplistic explanation of the difference between quantitative and qualitative research is that researchers base their conclusions on different kinds of information and also use different data analysis techniques (Durrheim, 2002). This adds to what was already discussed in section 2.2, namely on how qualitative research can be distinguished from quantitative research.

In terms of data collection, **quantitative research** collects data from numbers; in contrast, **qualitative research** collects data from language, whether written, spoken or observations recorded into language (Durrheim, 2002).

With data analysis, **quantitative research** employs statistical types of techniques, compared to **qualitative research** that identifies and categorises themes (Durrheim, 2002).

Nieuwenhuis (2014), however, argued that **qualitative research** is rooted in a qualitative research paradigm which serves as an alternative to the traditional positivist paradigm (refer chapter 1, page 10). This explanation is more than the shallow reduction of qualitative research as simply a manner in which data is collected and analysed.

This research project maintains an interpretivist paradigm and will therefore employ **qualitative research** methodologies.

The design of this exploratory and contextual, applied qualitative case study research will be described in more detail in section 2.4.

2.4 Case study research design

Every type of empirical research has a research design, whether implicit or explicit. As stated before, the design is the logical sequence that links the empirical data to the initial research question and finally to its conclusions (Yin, 2009). According to Yin (2009) there are five components of a research design that are important, specifically for case studies, namely:

- a study's questions;
- its propositions, if any;
- its unit or units of analysis;
- the logic linking the data to the propositions; and
- the criteria for interpreting the findings.

Each of these will be discussed in sections 2.4.1 to 2.4.5.

2.4.1 The study's questions

As was mentioned before, the case study method is most appropriate for answering the "how" and the "why" questions (Yin, 2009). A literature review is an important part of a study to ensure that the study adds value to the current literature (Yin, 2009). Chapter 3 will focus on contextualising GMAPs for this study, including investigating the different interpretations of the concept of sustainability.

The main research question has been formulated as (refer page 8):

Would management accounting principles, encapsulated by the newly published GMAPs, assist with the sustainability of a mechanised piggery in South Africa? Therefore, is it relevant to a commercial farming operation in South Africa?

Yin (2009) promoted the inclusion of study propositions that relate to the study's questions as part of case study methodology. The study propositions will be discussed in section 2.4.2.

2.4.2 The study propositions

The need for study propositions is indicative of a type of reasoning and therefore of the paradigm of a researcher (De Villiers & Fouché, 2015). Since the researcher has an interpretivist stance and will be making use of inductive reasoning or conduct inductive work (refer 2.4.7), this study will not have a hypothesis or proposition.

Yin (2009), however, argued that propositions direct attention to something specific that should be investigated within the scope of the study. Based on the requirement for direction and focus, exploratory questions which serve as secondary research questions, were posed as follows (refer chapter 1, page 9):

1. Is there an awareness of the general principles of management accounting as described by GMAPs within Piggery A?

2. Is there an unintended presence of any of the principles within Piggery A on GMAPs?

3. Which GMAPs principle would be the most relevant and important for Piggery A?

2.4.3 The unit of analysis

The unit of analysis relates to the fundamental problem within case study research of defining the "case" (Yin, 2009). This study follows the classic instance, according to Yin (2009), of a "case" being a single entity, an individual commercial farming operation, Piggery A.

The risk remains that the researcher would want to investigate “everything” about Piggery A (Yin, 2009). To address this potential risk, direction-giving questions were posed in section 2.4.2.

2.4.4 The logic linking the data to the propositions

According to Yin (2009), there are various ways to link data to the propositions which include 1) pattern matching, 2) explanation building, 3) time-series analysis, 4) logic models, and 5) cross case synthesis.

Since this study does not conform to the position of propositions, but rather to the position of direction-giving questions, themes will be identified by analysing the data collected, linking them to themes set by GMAPs. This will be discussed in chapter 3.

2.4.5 Criteria for interpreting the study’s findings

Yin (2009) posed four possible strategies to assist with the fair treatment of evidence, the formulation of compelling conclusions, and at the same time rule out alternative interpretations of the evidence. These four strategies are 1) the strategy of relying on theoretical propositions, which is considered to be the most preferred strategy; 2) developing a case description; 3) using both qualitative and quantitative data, and 4) examining rival explanations.

This study will use the strategy of developing a case description which will further be discussed in section 2.4.7, and in more detail in chapter 4. Notwithstanding, the study has a number of propositions which might appear to try to achieve the first strategy, but which are rather direction–giving questions in this case. Theoretical propositions, in contrast, refer to the use of theory as a measurement tool or set of best practices.

2.4.6 Data collection techniques

Data forms the foundation from which researchers derive their findings (Durrheim, 2002). Qualitative research employs various techniques to gather this data, which range from document reviews and various forms of observation to an assorted range of interview types (Nieuwenhuis, 2014).

Firstly, this study employed a form of observation technique by means of a field visit, where the researcher is seen as a participant. This technique allows a researcher to observe the situation, while ensuring that there is a sound understanding of what is being observed without getting involved with the setting (Nieuwenhuis, 2014).

The second technique employed during this study was that of semi-structured interviews, where a researcher collects data using a predetermined set of questions, while allowing room for follow-up questions to gain clarity from the participant's response to the questions (Nieuwenhuis, 2014). Nieuwenhuis (2014) described a number of keys to a successful interview which included, amongst others, the following:

- The interviewer must interview the most suitable person to answer the research questions. In Piggery A, Owner-A is the most suitable person, because of his close interaction with the entire farming operation of Piggery A.
- The interviewer should make it clear what the aim of the interview is.
- The interview should be aimed at collecting rich data and saturating the study's data needs.
- The interviewer should display good listening skills. This includes making sure that the interviewee is not dominated by the interviewer, and ensuring that the interviewee is at ease when participating in the interview.

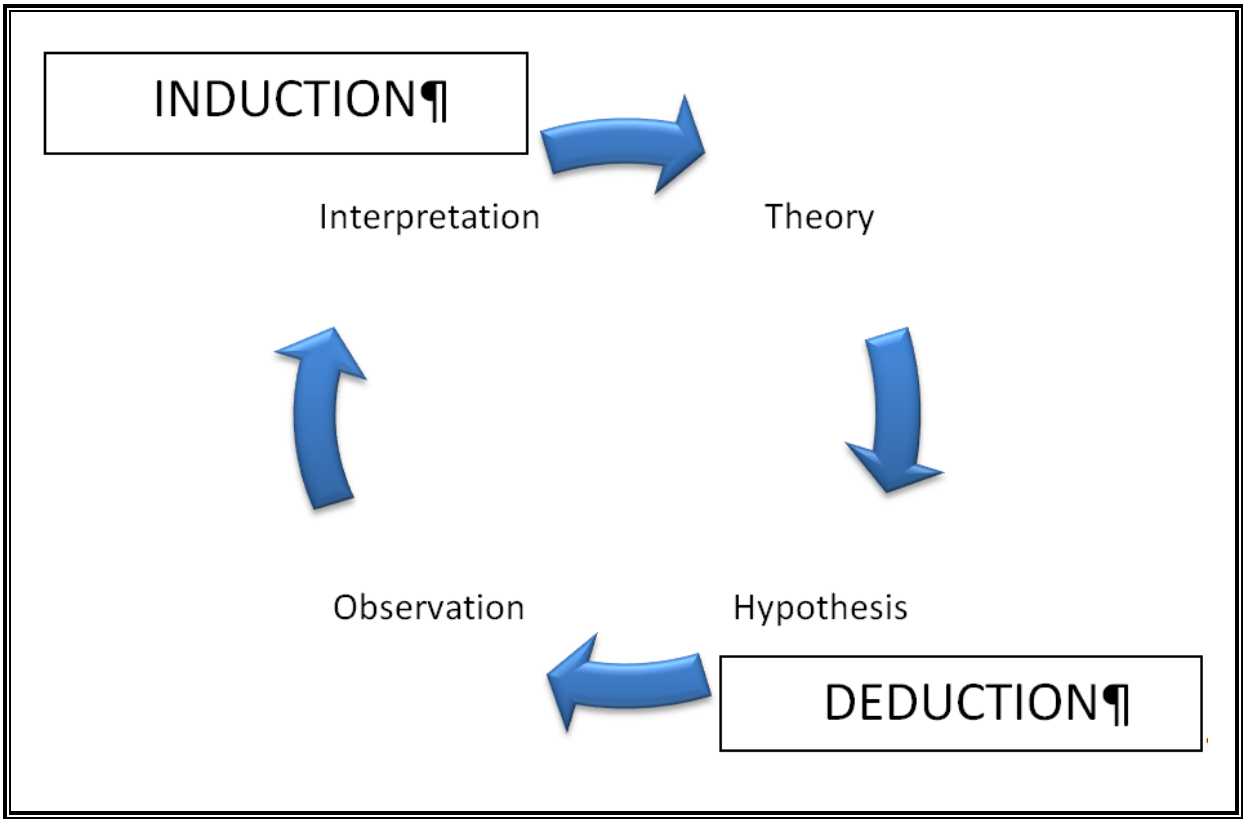
CIMA and AICPA (2015) published a diagnostic checklist for organisations to measure their management accounting functions using GMAPs as the benchmark for best practice. This checklist forms the foundation on which the predetermined set of questions are based. This diagnostic checklist is discussed in more detail in chapter 3 (refer page 34).

2.4.7 Theory development

Yin (2009) strongly promoted the use of theory development within case study research prior to the collection of any data. In contrast, Alvesson and Kärreman (2011) differed from that view in terms of how case studies can facilitate theory generation. Further to this, Otley and Berry (1994) described theory testing and

theory generation as part of a helix where the researcher moves from one theoretical position to another slightly different theoretical position, due to the impact that observations have had on the interpreting researcher. Terre Blanche and Durrheim (2002) illustrated what can be interpreted as the cycle between theory generation and theory testing which they called the hypothetico-deductive model (refer figure 2.2).

Figure 2.2: The hypothetico-deductive model



Source: Adapted from (Terre Blanche & Durrheim, 2002)

From figure 2.2 two concepts of importance emerge, namely that of induction in contrast to deduction. **Deductive** work is concerned with generating hypotheses from theoretical assumptions and then goes on to test this against empirical observation (Terre Blanche & Durrheim, 2002). **Inductive** work, in contrast, is concerned with theory generation through generalisations made during observations in an effort to explain the phenomenon under observation (Terre Blanche & Durrheim, 2002). This study will focus on the part of the cycle where observations are made and interpreted, therefore being an inductivist approach, in the exploration of the role that GMAPs can play in the sustainability of Piggery A.

This study will not generate or test a theory, but rather use theory or a concept as a tool for analysing and measuring the data collected. The relative contemporary concept of corporate sustainability with its supporting pillar theories (King Committee, 2009; Wilson, 2003) will relate to the evaluation of GMAPs in Piggery A. The primary concept used in this study is sustainability. Sustainability is explored and contextualised in chapter 3.

2.4.8 Quality and validity

According to House (as cited by Simons, 2009), validity is concerned with whether the research work is sound, defensible, coherent, well-grounded and appropriate to the case. Yin (2009) described four tests that are common to social research to establish the quality of empirical research, namely 1) construct validity, 2) internal validity, 3) external validity, and 4) reliability. Table 2.1 describes the four design tests.

Table 2.1: Case study tactics for four design tests

Test	Description of test	Case study tactic	Phase of research in which tactic occurs
Construct validity	Identifying correct operational measures for the concepts being studied	Use multiple sources of evidence	Data collection
		Establish chain of evidence	Data collection
		Have key informants review the draft case study report	Composition
Internal validity	(Not for descriptive or exploratory studies) Seeking to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from fake relationships.	Do pattern matching	Data analysis
		Do explanation building	Data analysis
		Address rival explanations	Data analysis
		Use logic models	Data analysis
External validity	Defining the domain to which a study's findings can be generalised	Use theory in single-case studies	Research design
		Use replication logic in multiple-case studies	Research design
Reliability	Demonstrating that the operations of a study - such as the data collection procedures - can be repeated, with the same results	Use case study protocol	Data collection
		Develop case study database	Data collection

Source: Adapted from (Yin, 2009)

Nieuwenhuis (2014) argued that, engaging in multiple methods of data collection - as with this case study - will add to the aim for valid and quality research findings. The use of “crystallisation” or “member checking”, where interpretations of data is crystallised or checked with the participant, would further strengthen the validity and quality of the research findings (Nieuwenhuis, 2014). “Crystallisation” or clarification agrees with one of the tactics of construct validity, namely having key informants to review the draft study report.

2.5 Limitations of case study research

Many case studies have been criticised by research investigators, expressing concern over a lack of meticulousness (Yin, 2009). Another concern about case studies is that they provide little basis for scientific generalisation (Nieuwenhuis, 2014). The quick answer to this concern is that case studies are generalisable to theoretical propositions and not to populations or universes (Yin, 2009). Nieuwenhuis (2014) argued that case study research is focussed on gaining a deeper insight and understanding of the dynamics of a specific occurrence.

Yin (2009) cited a third “frequent complaint” about case studies, namely that they take too long and produce large, unreadable documents. The solution to this is rigorous research design (Yin, 2009).

To conclude, a metaphor often used in social sciences with regard to case studies that have been well conducted is that such studies constitute the dewdrop in which the world is reflected (Nieuwenhuis, 2014).

2.6 Summary

This chapter aimed to address the first of the secondary objectives (refer page 9), which is to provide an understanding of the difference between research design and research methodology, including the paradigm to which qualitative research subscribes. Research design was metaphorically compared to the blueprint of a house, and research methodology compared to the tools and construction methods deployed to build the house from the blueprint.

Case study research was presented with the research type being a combination of exploratory and contextual applied research with an inductivist approach to qualitative research. The case study research methodology was discussed within the approach that Yin (2009) advocated. The data collection techniques that this case study utilised, were observation of operations during a field visit, as well as a predetermined set of questions used within a semi-structured approach to interviews. Theory was used for illustrative purposes in this study, rather than using the findings of the study to develop theories, as would generally be the aim with qualitative case studies. Yin's (2009) suggested approach to establish internal validity, external validity (where appropriate), construct validity and reliability was explained. This was supported by Nieuwenhuis's (2014) approach to include "crystallisation" or "member checking" to increase the validity and quality of the research findings. The limitations of case study research will be discussed next, where a single case study is metaphorically described as the world reflected in a dewdrop.

Chapter 3 will contextualise GMAPs and explore the concept of sustainability.

CHAPTER 3

3 GLOBAL MANAGEMENT ACCOUNTING PRINCIPLES

3.1 Introduction

This chapter aims to address the second secondary objective, as set in chapter 1 (refer page 9), of contextualising GMAPs and the key concept of sustainability from available literature.

A literature review is purposed to identify and analyse previous work done in the field (Kaniki, 2002). The aim is to provide a dialogue between the work of others and a research project (Silverman, 2013). Chapter 1 (refer page 5) outlined that the focus of past studies within management accounting was on complex costing systems, such as ABC (Joubert, 2015; Savic *et al.*, 2014; Konan, 2013; Middelberg, 2007; Holloway, 2004; Joubert, 1996; Bibbey, 1995; Le Roux, 1982). Three of these studies were conducted within the agricultural sector (Savic *et al.*, 2014; Holloway, 2004; Le Roux, 1982), one of which was conducted more than 30 years ago (Le Roux, 1982).

At the time this study was conducted, previous scientific research work on GMAPs could not be found. The reason for this is that GMAPs were only issued in 2014 (CIMA & AICPA, 2014b), which could be seen as fairly recent. Since no previous research work on GMAPs in commercial agriculture in South Africa or elsewhere could be found, a different approach to the concept of literature review in the context of GMAPs was required.

This project will make use of the concept of business sustainability as a lens through which GMAPs will be evaluated in the case of Piggery A (refer page 21). It is therefore important to provide a range of views on the definition of business sustainability. This will be discussed in more detail in section 3.2.

As stated before, GMAPs are relatively new. It is therefore important to introduce the structure of the set of principles in more detail. GMAPs consist of four distinct elements, as mentioned in chapter 1 (refer page 4). The combination of i) competent people, ii) clear principles, iii) well managed performance, and iv) strong practices makes a management accounting function to work well (CIMA & AICPA, 2014b).

This is what GMAPs aim to achieve. Section 3.3 will describe GMAPs in an introductory fashion, including a discussion of the four elements, without repeating the published executive summary that is publically available.

CIMA and AICPA (2015) published a diagnostic checklist for organisations to measure their management accounting functions against the background of GMAPs. This checklist will form a solid foundation for the gathering of empirical data about Piggery A. Section 3.4 will discuss this checklist and how it was used to gather the empirical data necessary to evaluate GMAPs as a tool to support Piggery A's sustainability (refer section 1.3.1).

Finally, section 3.5 will conclude and provide a summary of the chapter.

3.2 Defining business sustainability

The concept of sustainability was made famous by Brundtland (1989) in her speech addressing climate change. Sustainability stems from the word *sustain,* which means to manage to make something continue to exist over a long period of time - according to Dignen (2000).

CIMA *et al.* (2013) cited that research has found that businesses are placing more emphasis on sustainability, because it: i) has a positive effect on their profitability; ii) improves employee engagement and participation, and iii) positively affects the establishment of relationships with suppliers and customers. Ten key elements within three broad categories were described in their publication, which focused on long-term, forward looking practices (CIMA *et al.*, 2013) to keep organisations going for future generations. This agrees with the definition of sustainability according to Dignen (2000).

The King Committee (2009) defined sustainability by citing principles from the reformed United Kingdom corporate legislation. In their opinion, sustainability is concerned with taking an appropriate long-term perspective; actively building successful relationships with employees and those in the supply chain; and lastly taking the responsibility towards ethical practices - and their impact on social and environmental aspects of society - seriously (King Committee, 2009).

Business sustainability can therefore be defined as the management process of taking a long-term, forward-looking perspective, actively building stronger relationships with the various stakeholders to ensure that the business continues to exist for future generations.

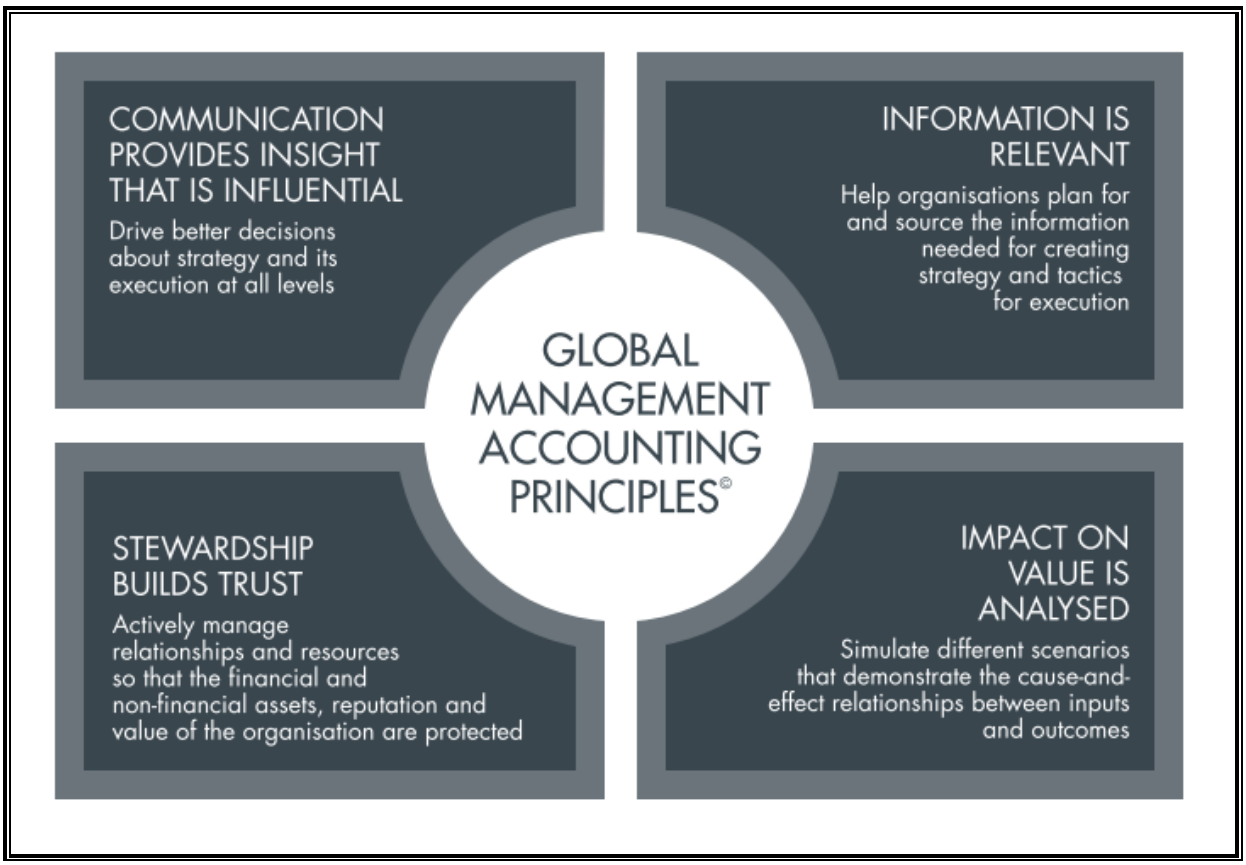
The lens through which GMAPs will be evaluated in Piggery A is therefore going to be focused on the long-term, forward looking impact of GMAPs elements on the business and its processes.

GMAPs are founded on four principles, which are combined with skills, performance systems and practice areas, to form the management accounting package for sustained growth (CIMA & AICPA, 2014b). The details around GMAPs will be discussed in the next section.

3.3 Global Management Accounting Principles (GMAPs)

The four principles on which GMAPs are built were discussed in Chapter 1 (refer page 4). The relationship between the four principles is illustrated in Figure 3.1 below.

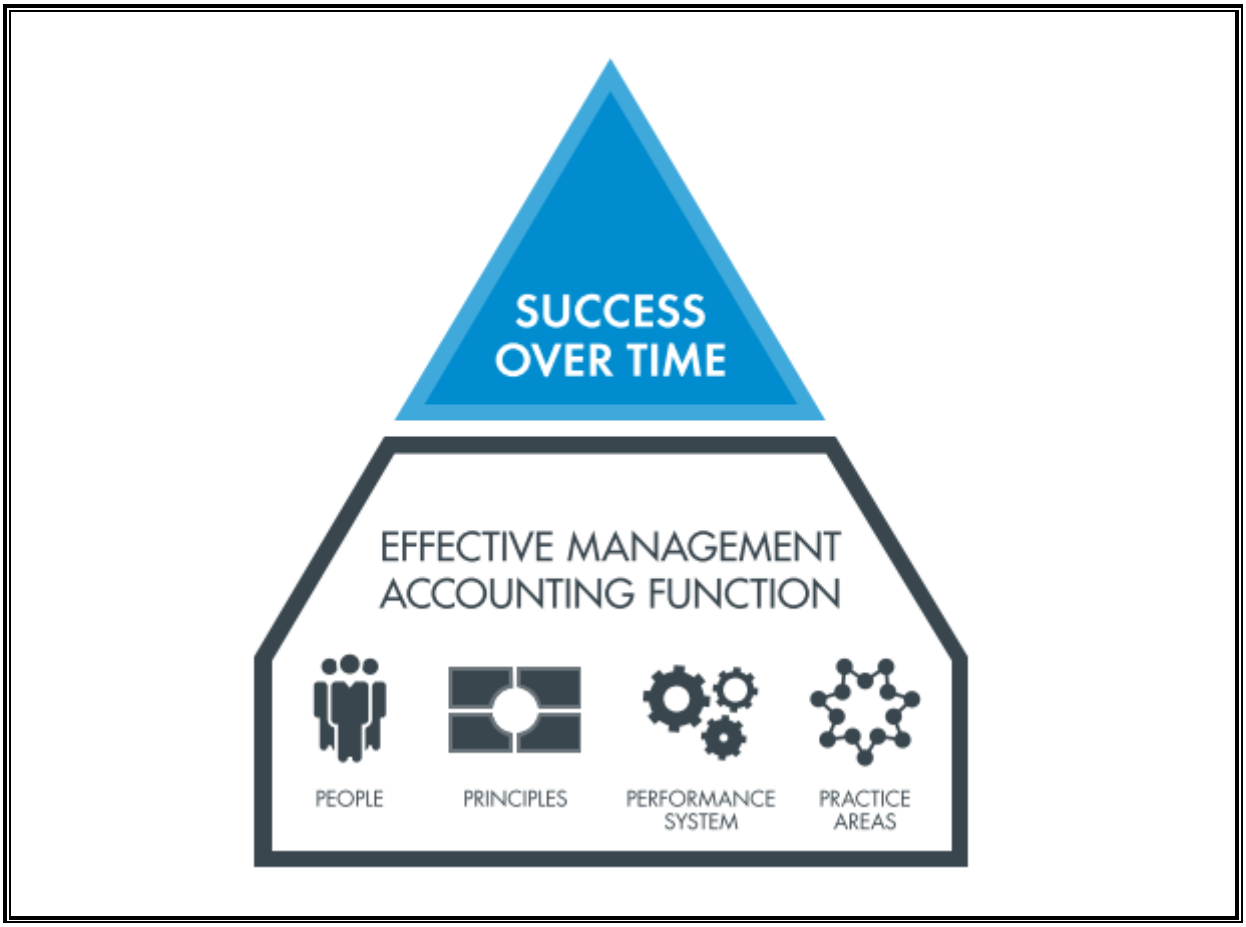
Figure 3.1: The Global Management Accounting Principles



Source: (CIMA & AICPA, 2014b)

In order for a management accounting function to be effective, GMAPs have to be supported by a combination of i) competent **people** (skills), ii) good **performance management**, and iii) vigorous **practices** (CIMA & AICPA, 2014b). This concept of interlocking elements as constituents for an effective management accounting function is illustrated in Figure 3.2.

Figure 3.2: Constituents of an effective management accounting function



Source: (CIMA & AICPA, 2014a)

Competent **people** play a major role in the delivery of long-term value to organisations (CIMA & AICPA, 2014a). CIMA and AICPA (2014a) described the combination of skills that a management accountant should be able to exert as being: financial expertise, business understanding and strong analytical skills.

Performance management consists of four distinct elements, namely strategy, plans, execution and evaluation or performing a review. Traditionally, the management accounting function provided the management information in the form of, amongst others, financial reports to assist with performance management. GMAPs, however, require that insight and analysis are communicated in such a way that relevant information is considered before a decision is made. This links directly with the first three principles of GMAPs, i.e. communication, information and value

(refer page 4), and hence expands the role of the management accounting function (CIMA & AICPA, 2014a).

It is therefore important for Piggery A to have elements of strategy, planning and execution, but most importantly also an element of influencing performance measurement in order to manage it sustainably.

CIMA and AICPA (2014a) argued that the role of the Chief Financial Officer (CFO) consists of various responsible areas concerned with generating value to stakeholders over time. Fourteen (14) of these responsible areas were listed as **practice areas** which contribute to sustainable organisational value (CIMA & AICPA, 2014a).

Table 3.1 provides a concise summary of the 14 practice areas and their value to an organisation.

Table 3.1 Core practice areas of the management accounting function

PRACTICE AREA	VALUE TO THE ORGANISATION
COST TRANSFORMATION AND MANAGEMENT	Improved customer satisfaction through the provision of product and service value for money.
EXTERNAL REPORTING	Engagement with a wide stakeholder base to communicate the organisation's strategy, business model and performance.
FINANCIAL STRATEGY	Balances the organisation's capital requirements with the expectations of stakeholders.
INTERNAL CONTROL	Provides assurance that assets are safeguarded and that resources are correctly accounted for.
INVESTMENT APPRAISAL	Prioritises opportunities for funding that generate value for stakeholders and avoids those which are likely to erode value.
MANAGEMENT AND BUDGETARY CONTROL	Evaluates performance against targets and enable improvement action to be taken.
PRICE, DISCOUNT AND PRODUCT DECISIONS	Enhances profitability and helps the organisation position products and services within their target market.
PROJECT MANAGEMENT	Provides controls over projects to increase the chance of benefits from projects being realised and risks minimised.
REGULATORY ADHERENCE AND COMPLIANCE	Preserves value and mitigates losses through avoiding direct and indirect costs of enforcement activities.
RESOURCE MANAGEMENT	Manages transformational or continuous improvements to products and processes efficiently and effectively.
RISK MANAGEMENT	Addresses uncertainty by increasing the probability of success and reducing the probability of failure in the execution of strategy.
STRATEGIC TAX MANAGEMENT	Raises awareness and understanding of the implications of relevant tax legislation in its jurisdictions.
TREASURY AND CASH MANAGEMENT	Provides sufficient cash to meet obligations and to fund prioritised opportunities.
INTERNAL AUDIT	Provides assurance that all risks are being adequately controlled and that long term value is protected.

Source: (CIMA & AICPA, 2014a)

By making use of the diagnostic checklist that CIMA and AICPA (2015) published to assist organisations in evaluating their management accounting function, the presence of the 14 practice areas for Piggery A, as a sole proprietor, will be established.

The diagnostic checklist will form part of the strategy in collecting empirical data and will be discussed in the next section.

3.4 GMAPs Diagnostic Checklist

CIMA and AICPA (2015) published a diagnostic checklist (refer Part 2 of Appendix A) as a tool to assess the effectiveness of an organisation's management accounting function. The checklist is made up of three sections that must be read in conjunction with the published GMAPs document (CIMA & AICPA, 2015).

The **first section** focuses on the **principles and** the **people**, assessing how the organisation's management accounts and larger function interact with the four principles of GMAPs.

The **second section** provides questions for assessing the organisation's **performance management system** in addressing the four **principles** of GMAPs. To achieve sustainable success, the managing stakeholders of an organisation have to ensure that performance management develops, deploys and refines the execution of strategy (CIMA & AICPA, 2015), which is what the second section of the checklist aims to assess.

The final (**third**) **section** of the checklist aims to assess the contribution of the organisation's management accounting function towards each of the 14 **practice areas**, or key activities, that the **principles** of GMAPs associate with a successful management accounting function.

Except for the final section of the checklist, all questions require a binary answer in either the affirmative or negative. Referring to chapter 2, a semi-structured approach to the checklist would provide an opportunity for elaboration on the answer to the question (Nieuwenhuis, 2014). It appears that the diagnostic checklist is designed to cater for large, multinational companies, and since Piggery A is a sole proprietor business type, it may not have as many formal structures, functions and practice areas as addressed by the diagnostic checklist. Therefore, the use of a semi-structured approach to the interview would provide insight into what is actually applicable to a sole proprietor agribusiness, given the difference in dynamics between a formal, legal entity to an informal, owner-managed type entity.

3.5 Summary

The topic of sustainability originated with Brundtland (1989) and evolved into a business term generally seen as a long-term, forward looking approach to business, which engages internal and external stakeholders constructively (CIMA *et al.*, 2013; King Committee, 2009) to ensure that the organisation is able to maintain itself and keep going (Dignen, 2000) well into the future.

Business sustainability serves as the filter or lens through which GMAPs will be evaluated in the sustainability of Piggery A.

GMAPs take the combination of appropriately skilled people and the four core principles within a functioning performance system and apply it to 14 practice areas to describe what a management accounting function should provide for sustainable success (CIMA & AICPA, 2014b).

Since the concept of GMAPs is a relatively new one - being published only in 2014 - CIMA and AICPA (2015) published a diagnostic checklist to assist organisations in assessing the contribution of their management accounting functions towards sustainable success. This checklist will form the foundation of the evaluation of GMAPs in the sustainability of Piggery A. By using a semi-structured face-to-face interview process (refer chapter 2), the diagnostic checklist was employed as the basis from which probing questions were asked to accommodate the more informal, owner managed sole proprietor type entity of Piggery A.

Chapter 4 will provide a detailed discussion on the findings and recommendations from the empirical study of Piggery A’s management accounting elements.

CHAPTER 4

4 EMPIRICAL CASE STUDY BASED ON THE GLOBAL MANAGEMENT ACCOUNTING PRINCIPLES

4.1 Introduction

The aim of this chapter is to address the main objective and the third secondary objective of this study, which is to summarise and conclude on the findings in order to evaluate GMAPs in the sustainability of a mechanised piggery (refer chapter 1, page 9). This chapter will also address the fourth secondary objective, which is to establish the basic management accounting need of Piggery A in order to prioritise the deployment of GMAPs from Piggery A's perspective.

The chapter will explore the data collected during the course of the interview and the field visit. Section 4.2 will describe the processes that were followed in collecting the data, while section 4.3 will explore the history and current structure of the commercial farming operation. It will also look into the concept of sustainability within this enduring operation, as directed by Part 1 of GMAPs diagnostic checklist (Appendix A). In section 4.3.1 to 4.3.3 the outcomes of the 3-part diagnostic checklist will be explored. Section 4.4 will provide a brief look at possible recommendations emanating from the study, while section 4.5 will conclude the chapter, with final remarks on the evidence as well as recommendations.

4.2 Process of data collection

From before the study was formally undertaken, the researcher had engaged with Owner-A about the research study, its aim and content. This ensured that the key individual to the study's data collection process (Nieuwenhuis, 2014) had a high level of buy-in and willingness to participate constructively to the collection of data.

During the design phase of the study, before the appointed interview was to take place, the predetermined set of questions was shared with Owner-A. In the built-up to the interview, the researcher and Owner-A communicated via telephone and email on a regular basis. It was clear that Owner-A's intricate knowledge of Piggery A, since inception, would suffice for the collection of rich data to saturate the study's data needs (refer page 20), and therefore only Owner-A was interviewed. At one

point during the interview Owner-A involved the professional accountant of Piggery At to assist with the evaluation of GMAPs in Piggery A. This will be described in more detail in section 4.4.3 on page 46.

The interview and field visit took place over a period of two days on the farm where Piggery A is being operated. The interview itself took place with intervals spread over the two days. Two formal interview sessions of approximately two hours each were conducted, using the set of questions from Appendix A, and held in the comfort of Owner-A's personal residence. This ensured that Owner-A was at his leisure and it facilitated the process of achieving the keys to a successful interview.

During the interview, the researcher made field notes while the conversation was being recorded. Owner-A had the opportunity to review some of the notes taken down and he answered some follow-up questions. During the two days' field visit, the researcher could also physically observe the operation of Piggery A and photographs of the pig steads were taken. The final field report, as well as the recordings of the interview, were shared with Owner-A to ensure quality and validity of the study (refer page 23).

The introduction to Piggery A is described in the next section.

4.3 History and operation of Piggery A

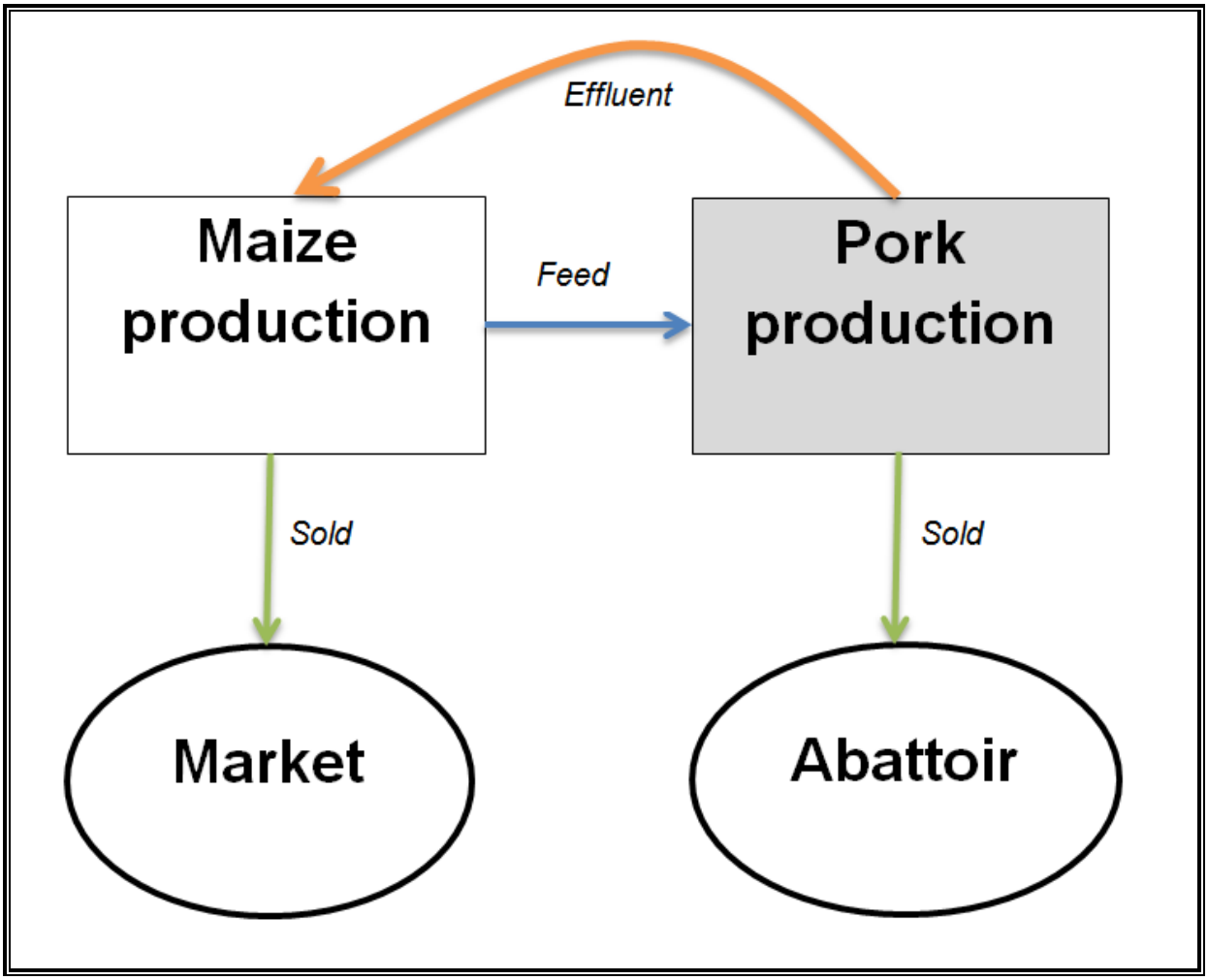
Owner-A bought the farm on which Piggery A is currently situated on 6 March 1968. This was also the year when the first pig stead was raised. The farming operation of Piggery A was established within a diverse farming operation which ranged from the planting and harvesting of maize to that of peanuts, amongst others.

It was only after Owner-A started researching and applying scientific farming practices that the land yielded increased returns. This enabled the farming operation to grow. The piggery was built using scientific principles to ensure optimum health of the sows and the piglets. The diverse farming operation grew and was extended with cattle farming in 1974 and dairy in 1982. Growth came with the procurement of additional farms in the area where the cattle farming continued and the dairy was raised.

In 1998 Owner-A started with a process of what is generally known as biological farming, using a natural variant of maize. Biological farming is also referred to as organic farming (Mäder *et al.*, 2000). Biological or organic farming entails the management of life within the soil of the maize lands. The use of chemicals are carefully managed to ensure that the life of bacteria and other organisms are not threaded with toxicity (European Commission, 2016). Owner-A is applying advanced farming practices, based on research conducted in the Mid-West of the United States of America (USA). This has resulted in the farm achieving record-high yields on maize - which ensured Owner-A's membership of the so-called "Ten Ton Club". This club recognises farmers' efforts and achievement of 10 tons per hectare harvest from maize. This is relevant to Piggery A, since all the maize harvested is consumed by the piggery.

Over the years, the piggery Owner-A have invested heavily in world-class advanced technologies in order to mechanise the pork production process. This has been done to ensure optimum pork production, and is further complemented by the use of premium quality feed. Mechanising technologies include the regulation of temperature, air and light of the steads, as well as mechanical automated feeding channels. The channels keep the optimally-mixed feed, at the correct quantity for the various growth stages, accessible for the pigs to consume. The effluent from the piggery is collected in a three-dam system. From this system the effluent is transferred to the croplands and used as fertiliser. The growth in the commercial farming operation necessitated the appointment of a farming manager for the piggery. Currently a staff complement of 12 permanent employees serve the piggery, while another eight permanent employees are servicing the cropland farming operation. The farming operation has one on-site bookkeeper, while an audit firm provides accounting and secretarial functions for the farming operation as a business. Figure 4.1 visually illustrates the integrated farming operation of Piggery A.

Figure 4.1: Farming operation of Piggery A



Source: Research findings

Owner-A realised, already at the early stages of the farming operation, that management information is crucial to a successful farming operation and furthermore that management information is not limited to financial information. The researcher was given access to the management information utilised by the farming operation. The information included *inter alia* soil content analysis and maize-leaf analysis to ascertain the needs of the plants and farm as scientific as possible. These analyses translate into remedying actions to be taken in the form of additives, such as agriculture lime or “soft” phosphates, to be provided to the soil.

The same analysis is conducted for the piggery. The information reflects the feed that each pig consumes (on average), as well as the weight of pork produced every week. This information is supported by basic financial information which provides Owner-A with a holistic view of the financial resource consumption of the piggery.

The data is forthcoming from various sources. The farming manager collects physical data around feed and maize consumption, while laboratories provide soil and leaf-analyses. The bookkeeper and professional accounting firm supply the financial information, resulting in a single holistic report that drives decision-making within Piggery A.

The fact that the farm was completely owner-funded until 2013 was emphasized at the start of the interview with Owner-A. Piggery A, being a sole proprietor type business, forms part of Owner-A's estate. Therefore, Piggery A's debt is Owner-A's personal debt. A high level of debt is therefore seen as unfavourable for Owner-A, an individual post-70 years of age. This is important to keep in mind, since the time he perceives as being left for him to repay the debt through the generation of profits from Piggery A, is limited. This fact negatively impacts his estate, which must fund the period during which he will retire from active participation in the farming operation of Piggery A. This was an important consideration when Owner-A had to make the decision whether to continue with Piggery A's operations, or whether to discontinue it in total. It can therefore be concluded that debt, also known as gearing, is not seen as favourable to the farming operation as may be suggested by conventional arguments to the contrary in the field of financial management (Correia, 2015).

Keeping the definition of sustainability (refer page 28) in mind, it can be concluded that the 48-year old farming operation has been operating sustainably, from a financial perspective, to date. If one observes the farming technologies and practices employed, it could reasonably be argued that these practices contribute to sustainable farming. The integration of the various farming activities and the recycling of waste products in a sustainable manner support this notion.

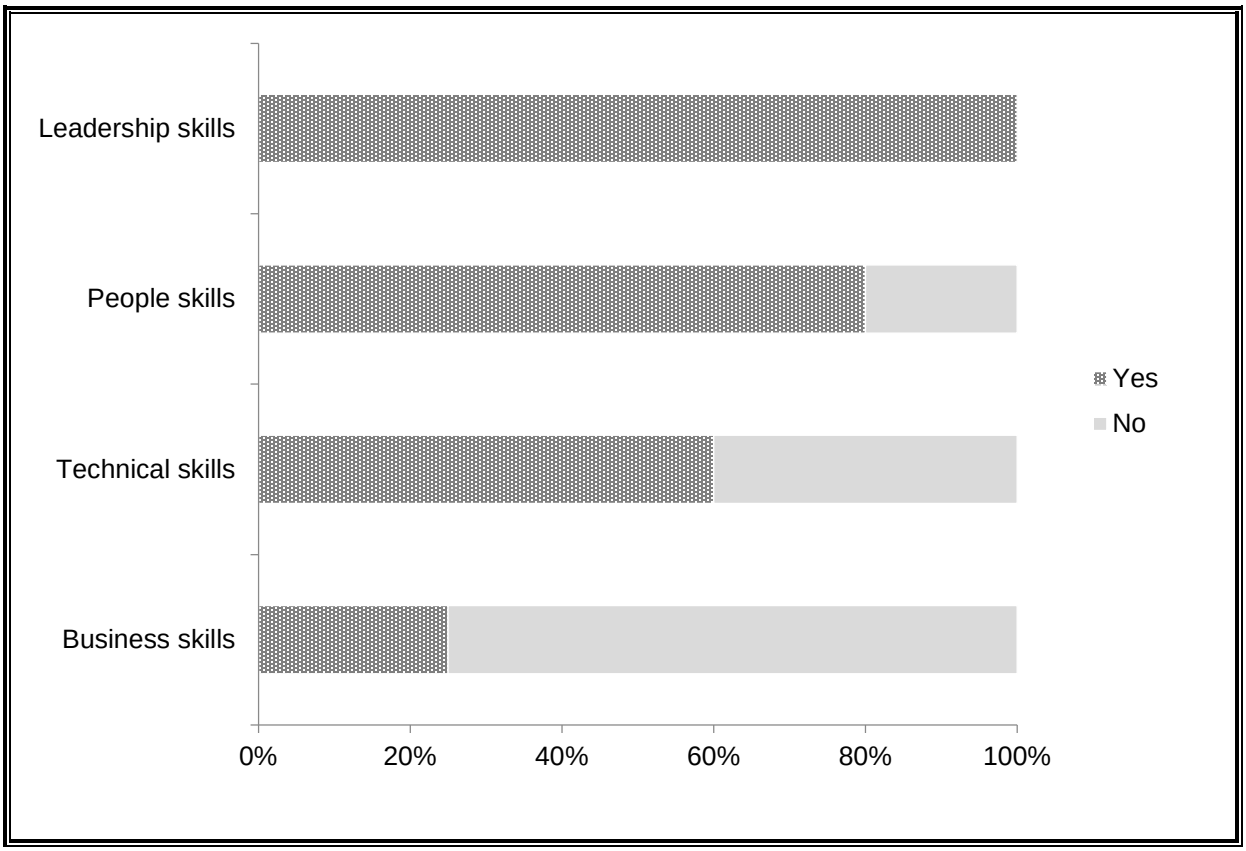
4.4 GMAPs diagnostic checklist

4.4.1 Section 1: Principles and People

The first section of the diagnostic checklist is focussed on assessing four types of skills within the management accounting function, namely i) technical skills, ii) business skills, iii) people skills, and iv) leadership skills. Since Piggery A is a sole proprietor business type with informal organograms and reporting lines, it was decided that the entire farming operation would be considered as part of the

management accounting function of the farming operation. Refer to Appendix A for the results of the answers to the questions. The results from the interview within section 1 is visually summarised in Graph 4.1 below.

Graph 4.1: Section 1: Principles and People



Source: Research findings

The questions were designed by CIMA and AICPA (2015) to solicit a “yes” or “no” answer. The detailed questions and answers to the questions have been captured in Appendix A (refer page II). Graph 4.1 visually represents the way in which Owner-A answered the diagnostic checklist questions. It is expressed as a percentage to give a comparable view of how Owner-A assessed each of the subjects diagnosed within section 1. Since the questions simply solicited a “yes” or “no”, it is possible to present the findings in this fashion. From Graph 4.1 it is clear that business skills and technical skills show the greatest room for improvement. Given that the answers have a qualitative nature, it is important to discuss each of the areas to support the visual presentation, or to provide a perspective that is different in quality due to the weight of the answers’ implications for the farming operation. The findings for each section can be described as follows:

i) Technical skills

Only the last two questions on the diagnostic checklist solicited a negative answer in Owner-A's assessment of the technical skills of the staff. The last two questions related to resource and risk management and strategy execution, as well as matters that concern corporate finance. This negative answer is considered as reasonable, given the type of business Piggery A operates as. This implies that strategy is much more informally communicated and executed, and corporate finance function principles are not followed due to the close integrated participation of the equity fund provider (Owner-A) in the day-to-day farming (business) operations.

ii) Business skills

The diagnostic checklist questions used to assess the business skills, in contrast to technical skills, show a different picture. Owner-A is of the opinion that only the improvement of operation effectiveness and efficiency is executed in Piggery A. Matters concerning strategy and value chain management is therefore not assigned any priority in the current operational execution of Piggery A.

iii) People skills

Similar to technical skills assessment, Owner-A was confident that Piggery A displays the people skills assessed by the diagnostic checklist, except for matters concerning stakeholders. Piggery A does not engage in stakeholder management, as evaluated by the diagnostic checklist.

iv) Leadership skills

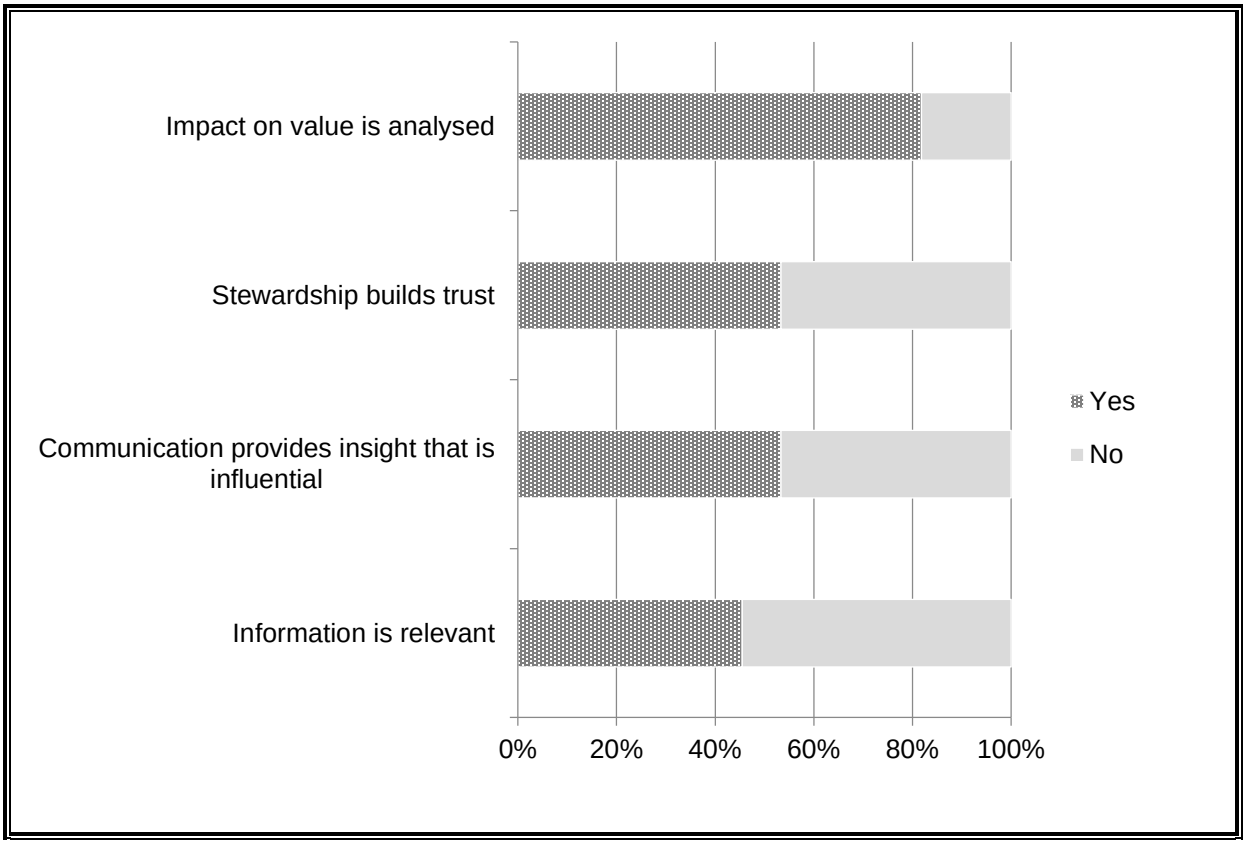
Lastly, Owner-A is confident about the leadership skills in Piggery A. This is considered a reasonable assessment, as Owner-A is part of the defined management accounting function of Piggery A that has a proven track record of farming sustainably since 1968.

The next section will discuss the results of Owner-A's assessment of the presence of GMAPs within Piggery A's management accounting function.

4.4.2 Section 2: Principles and Performance

Section 2 addresses all four the principles as set out in GMAPs (refer page 29) which are i) communication, ii) information, iii) value, and iv) trust. The findings from section 2 can be visually summarised as in Graph 4.2. Similar to Graph 4.1, it is possible to present the summary of findings, as a percentage of answers, in this fashion - due to the simplicity of the answers required by the questions.

Graph 4.2: Section 2: Principles and Performance



Source: Research findings

Section 2's questions, similar to those in section 1, are designed to solicit a "yes" or a "no". The questions, and answers to the questions, have been recorded in Appendix A (refer page VI). From Graph 4.2 it appears as if the most prevalent principle in Piggery A is the principle addressing analysis of information. The principle with the greatest room for improvement deals with the management of information. As mentioned with regard to Graph 4.1, it is important to discuss each section in more detail to provide qualitative context to the visual presentation. The visual presentation of Graph 4.2 is, for example, not an indication of the priority in

which GMAPs must be approached by farming operations. The findings of this section can be described as follows:

i) Communication provides insight that is influential

Although the piggery has not identified the external stakeholders and their lines of influence, strategic engagement with stakeholders is indeed present. This is important, as economic and other external information would be fed from external sources. The most important observation, however, is the low level of impact that management information is making when assessed against criteria such as post-implementation reviews. The last four questions of this part of the diagnostic checklist were all answered in the negative. These questions relate to the assessment of forecast performance, reviews of the effectiveness and efficiency of initiatives and processes, the evaluation of alternatives and post-implementation reviews. Strengthening the scope and use of management information would be an area that should be earmarked for improvement for Piggery A.

As mentioned before, Owner-A had to consider whether to continue or discontinue with the pork production operation of Piggery A, and he finally decided to phase out and discontinue this part of the larger farming operation. This decision that Owner-A had to take came as a surprise discovery during the field visit and is described in more detail on page 49.

The question that arises from this assessment is whether this principle could have informed Owner-A to a different conclusion in terms of continuing or discontinuing Piggery A's pig farming activities, had it been pro-actively pursued. The secondary question to this could be as follows: if the conclusion were to be the same, could the conclusion have been reached earlier, had the management information been applied or generated differently as suggested by the diagnostic checklist?

ii) Information is relevant

It was observed that Piggery A has a strong presence of operational information, both financial and non-financial in nature, which supports decision-making. It was, however, noted that strategic information, such as market share, key performance areas and risks and mitigating factors, is limited. Although the interview revealed that

the external environment - such as the economic environment - is not reviewed, the researcher observed that Owner-A and the manager of the piggery do engage with market-related information such as the price of pork for protein producers, as well as the presence and strength of competitors in the market. It is therefore concluded that engagement with strategic information is informal in nature and not documented in any formal way.

iii) Impact on value is analysed

As Owner-A considers Piggery A as not engaging with strategic information, Piggery A was expected to also not be engaging in the analysis of information on strategic level. This was confirmed in the owner's assessment in this principle area. The same conclusion, however, can be made in terms of strategic information analysis, as was concluded regarding the previous principle area. Piggery A informally analyses strategic information, which is internally processed during operational discussions between the manager of Piggery A and Owner-A. Similar to the previous principle, Piggery A's analysis of operational data is seen as strong in both presence and usage. The achievement of optimal productivity of the total farming operation is a positive confirmation of this observation. As Piggery A has no influence on the market price of pork, i.e. being a price taking protein producer, a matter such as customer-value analysis does not feature at all. This could change if the business model is slightly changed to engage in an activity such as direct sale of pork, compared to the current delivery of pork to a central market in the form of an abattoir.

iv) Stewardship builds trust

As was noted with regard to the first principle in this section, Piggery A does not engage external stakeholders on matters of value. This is then equally true regarding the alignment of the stakeholders' interests. Given the legal status and business form that Piggery A takes on, it was expected that Owner-A would have assessed the farming operation not to engage with matters related to internal controls and the internal audit. The integrated nature of the farming operation, combined with the biological and scientific farming practices that are followed, all support the notion that

stewardship towards the concept of sustainability is pursued for both the environment and the stakeholders.

4.4.3 Section 3: Principles and Practices

This section assesses the organisation in its entirety against the 14 practice areas that the GMAPs diagnostic checklist focuses on. The 14 practice areas are i) cost transformation and management, ii) external reporting, iii) financial strategy, iv) internal control, v) investment appraisal, vi) management and budgetary control, vii) price, discount and product decisions, viii) project management, ix) regulatory adherence and compliance, x) resource management, xi) risk management, xii) strategic tax management, xiii) treasury and cash management, and xiv) internal audit (refer Appendix A page XIV).

i) Cost transformation and management

Although Piggery A is perceived to understand the drivers of cost across the organisation, the participants of the management accounting functionality neither assist in the improvement of value-chain efficiency nor develop cost targets in conjunction with relevant parts of the farming operation. Owner-A argued that Piggery A is a price taker and therefore has little value in developing cost targets. The efficiency of the supply-chain could therefore be an area of evaluation and perhaps improvement to increase the overall profitability of the farming operation.

ii) External reporting

Piggery A has displayed the importance of internal reporting in the form of management information, even if the system used was informal. On the other hand, external reporting is viewed by Piggery A as a compliance necessity.

iii) Financial strategy

As Piggery A is a sole proprietor business entity, the optimal capital structure is determined by the financial risk appetite of the owner. From the interview it became evident that it was Owner-A’s aspiration to achieve a 100% owner-funded farming operation. Debt is not viewed as a mechanism to increase return on equity, but rather as a liability and increase of risk towards ownership of his estate.

iv) Internal control

Although internal controls are not documented, Owner-A is confident that controls exist to safeguard resources. The key employees of Piggery A participate in the process of safeguarding resources, including the provision of financial and non-financial information to report on the activities.

v) Investment appraisal

Investment appraisals are performed as and when a new capital project is considered. Owner-A confirmed that, with every expansion project, a full economic and business plan was submitted to the provider of finance. Piggery A however indicated that post-implementation reviews are not performed (refer page 44), which leaves room for improvement in terms of the use of investment appraisals as a practice area to influence decision-making.

vi) Management and budgetary control

Targets are set for operational non-financial performance, and performance is measured for each target on a continuous basis. These targets, however, are not translated into financial targets, given the price taking nature of the business model. A possible improvement that can be made in this practice area is to pursue cost management targets to compensate for the lack of influence on the selling price of products as a measure to maximise profit.

vii) Price, discount and product decisions

Piggery A produces management information regarding production on all product lines, which is coupled with financial information from the general ledger. Therefore the only applicable measurement in this practice area is the use of various sets of numbers, both financial and non-financial in nature, and information to facilitate decision-making.

viii) Project management

Project management and investment appraisals enjoy similar importance. Every expansion of the farming operation was accompanied by a business plan, compiled

in support of applying for finance from the provider of funds, which was the bank since 2013 (refer page 37).

ix) Regulatory adherence and compliance

Piggery A recently underwent a tax audit which revealed weaknesses in the controls related to regulatory adherence and compliance. This resulted in the appointment of the current professional accounting firm as the source of accounting services, as well as the sourcing of a new bookkeeper who has a vested interest in the success of Piggery A.

x) Resource management

Piggery A is exposed to scarce resources other than financial resources, such as specific feed supplement for pigs, which has to be carefully managed and procured due to its limited availability. What stood out most from the management information that Piggery A has produced is the use of the principle of opportunity cost. The exact opportunity cost of consuming the maize harvested from the crop fields, as opposed to selling it on the market, is measured for every month's consumption. This information keeps Owner-A cognisant of market conditions and his overall product profitability.

xi) Risk management

Risk management is limited to operational matters only. Entity financial risk and other risks are not identified, measured or controlled in any way. This could be an area for improvement.

xii) Strategic tax management

Given the form of the business entity, Piggery A focuses on complying with tax legislation, rather than actively engaging in strategies to reduce tax liabilities. Transfer pricing is not applicable to Piggery A. The last matter which this practice area assesses is the matter of the management accounting function acting as the ethical conscience of the organisation. This was considered not to be applicable to Piggery A, since there is no separate management accounting function within Piggery A.

xiii) Treasury and cash management

Piggery A, as a sole proprietor, does not have issued share capital or foreign exchange transactions which would make up advanced treasury transactions. It is therefore reasonable that only cash management is very actively managed and forecasted. Cash management would include the management of debtors and creditors. This implies that financial risk is also actively monitored and managed.

xiv) Internal audit

Since Piggery A has no internal audit function, this practice area in its entirety was considered not applicable. Owner-A went further to confirm that no formal activities in this discipline are pursued, even not by the accounting firm. It might add value for Piggery A to have a once-off review of the internal controls of the farming operation, done by an external party, to objectively provide an assessment of the residual risks that the farming operation faces with the current controls in place, specifically around supply-chain and financial matters.

4.5 General observations

Many of the questions of the Diagnostic Checklist have been specifically formulated to assist organisations with formal structures such as companies. A function like internal audit has little to no use for an informal business structure such as a sole proprietor, or an owner-managed private company. Notwithstanding, there could be principles embedded in the practice area of internal audit which is applicable across all business forms. Internal controls could take on many forms in different businesses. For example: Owner-A has ensured that he is always aware of Piggery A's bank balance. That provides assurance that no expense is paid without his knowledge, or that he is at least alerted to expenses paid which he should investigate.

The most unexpected discovery made during the study was that Owner-A has decided to discontinue the pork production operation by end of December 2016. When asked to explain what lead him to this decision, four factors were put forward as the definitive considerations, which will be discussed in detail hereafter:

1. The effect of the African Growth and Opportunity Act (AGOA) Trade Agreement between South Africa and the United States of America (USA) concluded during the course of 2016;

2. Mega-farming operations such as the one filmed by Dreyer (2016);

3. Piggery A's losses made over the last three years; and

4. South Africa's expected economic growth of close to 0%.

4.5.1 AGOA Trade Agreement

The first factor was described as the pivotal factor in the decision to stop the pork production. According to Owner-A, about 40 tons of pork, already processed in manageable portions, are imported to South Africa from the USA on a continuous basis. This is done at a reduced price as compared to the market. Piggery A's production cost is higher than the prevailing market price and as such the piggery became unprofitable.

4.5.2 Mega-farming operations

The presence of what is termed as "mega- farming" operations, such as the farming operation described in the Afrikaans television series Megaboere on the KykNET channel (Dreyer, 2016), further informed Owner-A's decision. Owner-A described two such farming operations of which the one is a developed-economy sponsored project to build a 5 000 sow unit in the same area as Piggery A as a BEE project. Owner-A estimated the cost of such a unit to be in the region of R250 million. This is a scale that Piggery A will not obtain by organic growth.

The farming operation which Dreyer (2016) documented (referred to as Piggery M), as another example, produces 20% of the South African market's pork and has a 25% market share of the South Africa pork producers (Dreyer, 2016). This has a direct impact on the market price of pork. Since Piggery A is a price taker, it results in the profitability of Piggery A being negatively affected, as also informed by the third factor. Dreyer (2016) documented the farming operation of Piggery M, which had 20 000 sows in production at the time of filming, with 1 000+ employees in service, and was building another production plant for an additional 9 000 sows. This

mega farming operation is described as a vertically-integrated supply chain against which Piggery A cannot compete. Besides the piggery, this mega farming operation has a dairy operation with 9 000 cows milked twice daily. The cows feed off a pasture system, meaning pasture is cultivated. The dairy supplies a cheese factory with the required milk to produce its products and in return, the dairy provides the piggery with whey, which serves as an important component of the feed mixture of the pork production operation. The pork production operation, in turn, supplies effluent that provides the necessary nutrients to cultivate lush pasture for the dairy operation. At the time of filming, the farming operation started producing electricity from the methane harvested from the piggery's manure. All this provides for a competitive advantage which would make it difficult for average commercial farmers to compete against and still be profitable.

4.5.3 Piggery A's losses

The decrease in the price of pork was evident from the management information of Piggery A. This had an extremely negative impact on the profitability of Piggery A. Although Piggery A has an integrated farming operation that can be seen as naturally sustainable, it remains confined within the farming operation itself and therefore does not have the same economic leverage that an integrated supply chain such as Piggery M has. Owner-A indicated that, if Piggery A was to become profitable again, it would have to widen its range of services to include value-adding activities such as an abattoir where the production of the piggery can be processed to be sold on the market at a premium.

The next important factor that Piggery A needs to turn around in profitability is the production size. With less than 600 sows, Piggery A does not command the economies of scale which would allude to any advantage over other producers in terms of bargaining power with the abattoirs in the region. After consulting with Piggery A's banker, as well as with a respected abattoirs near Johannesburg, Owner-A came to the conclusion that Piggery A would continue to make a loss given the economic circumstances in which the piggery has to operate.

4.5.4 South Africa's expected economic growth

Owner-A stated that various external sources of information informed him that the South African economy is expected to grow by close to 0%. StatsSA (2016) declared that the South African economy retracted by 1.2% in the first quarter of 2016, quarter-on-quarter, and grew by 0.6% in the second quarter of 2016 year-on-year. Given this weak growth recorded in the first semester of 2016, coupled with the weak growth of 0.6% in the fourth quarter of 2015, year-on-year, it is not unreasonable for Owner-A to expect the South African economy to grow by close to 0%.

In addition to the four main factors described, an overarching factor to the decision to discontinue pork production, is the advanced age of Owner-A. Given that Piggery A is a sole proprietor business form, the age of Owner-A precludes it from engaging in major capital projects which would take any given number of years to become productive and profitable. Principles within GMAPs inform this as well, given that Owner-A is a key stakeholder and that the regulatory environment as well as key external stakeholders would have to be identified and engaged in this matter, which is what Owner-A has done by consulting the bank and the abattoir.

4.6 Conclusion on findings

The decision to divest from the piggery operation has been unexpected, given the observation of sound business principles evident by the presence of GMAPs in the farming operation. The conclusion can therefore be made that GMAPs would, at best, provide the platform for Owner-A to make an informed decision regarding continuation of the operation of Piggery A. Since the principles that were observed as being present in the farming operation were not assessed in terms of quality or scope, the question would arise as to the extent that GMAPs could have informed the decision to discontinue the production of pork at an earlier date to limit the losses made over the last three years. Another question would be whether GMAPs would have provided guidance to Owner-A in terms of alternative options to replace the loss of cash generation capability through diversification, such as the acquisition of a herd of sheep for the production of lamb, or the acquisition of a herd of cattle for beef production. The answers would depend on the deployment of the principles throughout the farming operation and the participation of all key stakeholders of the

farming operation, both internal and external, if they are identified and kept informed in this regard.

From this, it is evident that the most basic need of Piggery A in terms of management accounting is the production of management information in a decision-useful way. This is seen with information which Owner-A reviews on a monthly basis, which includes financial and non-financial information and is produced by various internal stakeholders of the farming operation. Therefore, the most important principle of GMAPs for Piggery A, is “information is relevant” and “impact on value is analysed”, followed closely by “Communication provides insight that is influential”. Furthermore, the information that is gathered by the internal stakeholders must be analysed and presented in similar fashion as is currently the practice, in order to provide for a platform to communicate with external stakeholders such as the banker and abattoirs.

4.7 Summary

The objective of this chapter was to summarise the findings from the field work, which would address the fourth secondary objective in order to evaluate GMAPs in the sustainability of Piggery A, being the main objective of the study.

From the results, it is evident that, without pre-knowledge of the content of GMAPs, Piggery A has employed a great number of the concepts and principles GMAPs described as best practice. The farming operation was assessed as being sustainable, given its integrated operating activities completing a circle which can be sustained physically. The descriptions of a number of principles were found not to be applicable to the business-form in which Piggery A operates. However, the underlying principles, such as the assessment of internal controls with the internal audit function, could be adopted in an informal approach to further add value to the farming operation.

Despite the strong presence of principles of GMAPs in Piggery A, external factors such as the economic trade agreement with the USA’s subsidised produce market, the presence of mega producing competitors in the South African market, the persistence of Piggery A’s operating losses and South Africa’s bleak economic outlook, informed Owner-A to discontinue the production of pork over a period of

time. The questions that remain are firstly whether or not GMAPs could have assisted Owner-A with steering clear of this definitive decision by providing the information more timely with strategic options to turn the profitability of Piggery A around? Secondly, it could be asked whether or not GMAPs could have informed the decision earlier on, with strategic alternative options to consider for cash generating activities which could harness the infrastructure already in place to avoid prolonged periods of internal losses. Both questions should be considered within a hypothetical context that GMAPs has been a known tool in the overall management accounting function, which is Piggery A.

The fourth secondary objective was met with the prioritisation of GMAPs, as observed to be present within Piggery A. The most prevalent GMAPs for Piggery A seem to be that of “information that is relevant”, with “impact on value that is analysed” in the next order of dominance, followed lastly by “communication that provide insight that is influential”.

The next chapter will summarise the study and conclude on the achievement of the study’s objectives.

CHAPTER 5

5 SUMMARY AND CONCLUSION

5.1 Introduction

Chapter 4 presented the findings of the empirical case study and concluded that principles within GMAPs supported Owner-A's decision to discontinue pork production, a surprise discovery made at the empirical phase of the research project. This chapter will summarise the research project and will address the research objectives (section 5.2), provide a research synopsis (section 5.3), summarise the study's recommendation (section 5.4), address the limitations of this case study (section 5.5), and conclude with recommendations for further research (section 5.6).

5.2 Research objectives – results

The diagnostic checklist (refer Appendix A page II) formed the basis for the evaluation of GMAPs in Piggery A. Through field visit observation and an in depth face-to-face interview, as well as by the completion of the diagnostic checklist, the principles of GMAPs that feature at Piggery A were established and evaluated.

5.2.1 Main objective

The main objective was to evaluate GMAPs in the sustainability of Piggery A (Chapter 1, page 9). It was discovered that Piggery A has been operating since 1968 and is applying practices that can be argued to contribute towards a sustainable farming operation. It was also discovered that Piggery A was operated without debt until as recently as 2013. Owner-A considered this to be a real measure of success which also alluded to his risk appetite being low. The conclusion was therefore made that Piggery A has been operating sustainably for 48 years. It was established through the diagnostic checklist and a process of "crystallisation" (refer chapter 2, page 23) that Piggery A engages in a large number of principles and practices measured with the diagnostic checklist. During the interview, it was discovered that Owner-A took four main factors into consideration when making a decision to discontinue pork production. It can therefore be concluded that GMAPs that were displayed at Piggery A assisted with the sustainability of Piggery A and also supported Owner-A's decision-making process regarding the future of the pork

production part of the farming operation. The main objective of the study has therefore been achieved.

5.2.2 Secondary objectives

Various secondary objectives were achieved during the execution of the study. The first secondary objective aimed at establishing the appropriate research methodology. This objective was achieved and described in detail in chapter 2 (refer page 13).

The second secondary objective was to contextualise GMAPs and explore the concept of sustainability from available literature. Chapter 3 (refer page 27) discussed GMAPs with visual presentations of the principles of GMAPs. Business sustainability was defined as the management process of taking a long-term, forward-looking perspective, actively building stronger relationships with the various stakeholders to ensure that the business continues to exist for future generations.

The third secondary objective was to establish the basic management accounting need and the corresponding GMAP in order to prioritise the deployment of GMAPs. Chapter 4 (refer page 52) showed that Piggery A should start with the gathering of relevant information that would feed analysis exercises to enable influential communication. The GMAP related to stewardship is a fundamental part of any information value chain and should form the foundation upon which every other GMAP is built on.

The fourth secondary objective was to summarise and conclude on the findings of the exploratory case study. Chapter 4 (refer page 36) summarised pages of findings from the empirical case study, therefore achieving the set objective.

The last secondary objective was to conclude the study, which is the main objective of this chapter, Chapter 5.

5.3 Research synopsis

This study highlighted that research in the field of management accounting is dominated by the application and evaluation of complex cost allocation systems such as ABC, with studies investigating such systems within the agricultural sector.

Problems were, however, experienced with the implementation and maintenance of ABC, which lead to the conclusion that businesses should take a step back and first look at applying the basics correctly before embarking on implementing complex cost allocation systems such as ABC.

The agricultural sector in South Africa finds itself at a pinnacle point, facing major obstacles as described in Chapter 1 (page 1). It was therefore appropriate to argue that commercial agriculture needs a new tool to assist operations in navigating the complexity of today's economic circumstances. GMAPs are proposed as a solution to this phenomenon. Combined with the challenges facing the agricultural sector, the fact that no research on the applicability of GMAPs had been done on the sector before, it was found appropriate to conduct a qualitative exploratory research case study with Piggery A.

Chapter 2 described, in detail, the appropriate research methodology within case study research, highlighting a process of ensuring quality and validity as well as navigating its limitations.

Chapter 3 summarised GMAPs as the foundation of the empirical study and provided the lens through which GMAPs would be evaluated, being that of sustainability. Piggery A's case provided in depth insight into the management accounting function of a commercial and mechanised farming operation with integrated farming activities with the business entity. This was described in detail in chapter 4.

The empirical data was collected through a series of semi-structured interviews conducted at Piggery A, using the diagnostic checklist for GMAPs as a foundation. All three sections of the diagnostic checklist for GMAPs were answered. During the interviews, follow up questions were posed by the researcher to "crystallise" certain answers from Owner-A on the diagnostic checklist. Some answers lead to further questions which brought the discovery of some surprising elements to the fore, such as the motivation for the decision to discontinue pork production at Piggery A.

Being an exploratory research case study, it was discovered that GMAPs had a surprisingly strong presence within Piggery A, without any of the key stakeholders having prior knowledge thereof. This discovery lead to the conclusion that, if GMAPs can be practiced in a sole proprietor farming operation, it can also be practiced within

more complex farming operations within legal entity business forms, such as companies.

Regardless of the fact that Owner-A decided to discontinue pork production at Piggery A, GMAPs were evaluated as being supportive to the sustainability of Piggery A, having operated since 1968 utilising principles described by GMAPs. It supports the recommendation that GMAPs should be considered as a tool for establishing best practice in commercial farming operations, given its wide applicability.

This final chapter, Chapter 5, summarised the research objectives and methodology of the study, as well as its findings, recommendations and limitations. Recommendations for further research concluded the study.

5.4 Recommendation

Even with the presence of GMAPs in the business, Piggery A was unable to profitably navigate the external forces that impacted the farming operation. These forces were summarised as being external economic factors in the form of the AGOA Trade Agreement with the USA, rivalry amongst competitors with the existence of mega farmers with farming operations using sophisticated and integrated supply chains and an unparalleled economies of scale, as well as the close to zero growth of South Africa's economy. These factors lead to internal profitability issues that were aggravated by the opportunity cost of consuming the high quality maize harvested from the farming operation's maize fields by the piggery, rather than selling it on the market at a profit. The strong presence of GMAPs in Piggery A contributed to the decision-making process that Owner-A described.

Although the question could be asked as to whether or not Owner-A could have made the decision to discontinue pork production earlier, had GMAPs been actively pursued as best practice, it might not be the correct question to contemplate. More appropriately, the question that has arisen from this case study is whether or not Owner-A would have come to a decision to discontinue pork production in any case, had GMAPs not been present in Piggery A at all, or even nearly as strong as was the case.

As GMAPs were found in practice in Piggery A - a sole proprietor - supporting its sustainability, it could be generalised that GMAPs would be applicable to more complex business forms such as companies, trusts or closed corporations.

It is therefore recommended, based on the findings of this study, that all commercial farming operations should consider GMAPs as a tool to establish best practice in the support of decision-making that promotes sustainability of farming operations.

5.5 Limitations of this study

The most prominent limitation of this study is based on the inherent limitations of case study research (refer chapter 2, page 25). This study gained an in depth understanding of a specific phenomenon (Nieuwenhuis, 2014), being Piggery A's farming operation. Piggery A operates as a sole proprietor which could be seen as a basic business form (Correia, 2015). As such, the findings from this study cannot be generalised. However, most commercial farming operations that operate within a sole proprietor business form can use GMAPs as a tool to enhance the quality of the decision-making processes.

Another limitation is that this study highly relied on the information provided by the owner and professional accountant of Piggery A to evaluate the presence of GMAPs in Piggery A.

5.6 Recommendations for further research

This study leaves the following opportunities for further research:

- The evaluation of GMAPs can be extended to mega-farming operations that operate within legal entities such as companies.
- The diagnostic checklist is designed to cater for corporates with separate management accounting functions. Qualitative research can be conducted to determine possible replacement questions for the parts that focus of matters such as the treasury function or external auditing.
- The use of a Likert scale when answering the diagnostic checklist can be investigated to add further value to researchers' evaluation of GMAPs, making

it possible to determine the extent to which GMAPs contribute towards the sustainability of a farming operation.

- This study focused on a case where the farming operation had not been aware of the existence of the best practice highlighted by GMAPs. A study can be conducted on farming operations' performance before and after awareness has been cultivated to evaluate the economic contribution that GMAPs bring to the table.

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7 APPENDIX A

7.1 Part 1: Unstructured questions

Key questions to converse about:

- When did you start?
- With what type of agricultural activity did you start and how did it progress / evolve since then?
- How many employees do you employ?
- Current business model and organisational structure?
- Over this period, how did you collect and analyse information?

7.2 Part 2: GMAPs checklist

Source: (CIMA & AICPA, 2015) adapted

7.2.1 Section 1: Principles and People

Technical skills

Are you confident that your business and its accounting firm:

Question	**Yes/No**	**Notes**
Relies on operational systems and processes that are compliant with statutory requirements and regulatory obligations?	Yes	
Maintains record to report processes that comply with statutory requirements and regulatory obligations?	Yes	
Provides performance analysis, resource and risk management, reporting and planning that drives competitive strategy execution?	Yes No	
Performs corporate finance functions that optimise capital structure, manage risk, and evaluate and efficiently integrate acquired assets?	No	

Business Skills

Do your business and its accounting firm:

Question	Yes/No	Notes
Develop and communicate strategy and strategy execution plans that take account of macro-economic conditions and market forces?	No	
Develop, simplify, manage and refine operational structures, processes, projects and activities to improve operational effectiveness and efficiency?	Yes	Owner-A From data received from various data collection points.
Manage value chain relationships, contract performance and risk?	No	
Develop and streamline processes to optimise the value chain?	No	

People Skills

Do you, your managers and your accounting resources:

Question	Yes/No	Notes
Understand what senior management and the board need to help them to do their jobs better?	Yes	
Influence and gain the support of stakeholders by demonstrating empathy, diplomacy, logic, conviction and an appreciation of all the relevant factors?	No	
Manage and negotiate positive outcomes by researching and sharing the facts, understanding stakeholder requirements and gaining the trust of stakeholders?	Yes	
Communicate effectively with stakeholders by translating complexity, using appropriate forums and media, adapting personal style to the situation, mastery of the facts, and creating confidence?	Yes	
Cultivate and nurture cross-functional relationships to create value by encouraging a collaborative culture to deliver shared goals?	Yes	

Leadership skills

Do you, your managers and your accounting resources:

Question	Yes/No	Notes
Drive team performance by promoting and encouraging participation and the sharing of ideas that align with the organisational strategy and maximise goals?	Yes	
Coach and advise others on how to perform, improve and succeed by producing excellent results?	Yes	
Drive performance by supporting, implementing and monitoring effective performance management processes?	Yes	
Motivate and inspire others by creating a workplace where colleagues are inspired, encouraged and valued?	Yes	
Manage change by recognising the need for and embracing new ways of thinking and working that align with business objectives and financial targets?	Yes	

7.2.2 Section 2: Principles and Performance

Communication provides insight that is influential

Question	Yes/No	Who?	Notes
Are internal and external stakeholders identified?	No		Only internal stakeholders
Are the connections between their interests and influences and the organisation's purpose clear?	No		
Is it clear how the strategic objectives represent the organisation's purpose?	Yes		
Do stakeholder groups engage in strategic conversations?	Yes		
Are risks to the achievement of strategic objectives communicated with stakeholders?	Yes		
Is the connectivity of initiatives and processes to objectives well communicated?	Yes		
Are people's jobs aligned to initiatives and processes?	Yes		
Is there line of sight between what people and teams do, and	No		

Question	Yes/No	Who?	Notes
strategic objectives?			
Are results communicated according to stakeholder needs?	Yes		
Are results communicated in terms of their impact on strategic objectives?	Yes		
Are results accessible?	Yes		
Does management information include an assessment of forecast performance?	No		
Does management information include a review of the effectiveness and efficiency of initiatives and processes?	No		
Does management information include the evaluation of alternative options?	No		
Does management information include post-implementation reviews?	No		

Information is relevant

Question	Yes/No	Notes
Is the external environment considered, e.g. the competitive scene, economic landscape, regulatory and legal frameworks?	No	
Is the strategic position of the organisation identified and quantified, e.g. market share, availability of resources, and assessment of competencies?	No	
Are key measures of success agreed?	No	
Does the data plan support performance management?	Yes	
Are key risks and their mitigations identified?	No	
Does the business plan also have a data plan so that initiatives and processes are reliably assessable upon execution?	No	
Is the management information system defined and approved by the business's users?	No	
Is the management information system built and ready for	Yes	

Question	Yes/No	Notes
decision-support?		
Does the organisation have ready access to real-time information about financial and non-financial results?	Yes	
Are early warning indicators for quick corrective actions in place?	Yes	
Does management information inform decisions on: Execution refinement? Future plans? Future strategy?	Yes	

Impact on value is analysed

Question	Yes/No	Notes
Are strategic options evaluated in the context of the organisation's strategic position and the key risks?	No	
Is the customer-value proposition compelling?	No	
Is the business model competitive and agile?	Yes	
Are planned options validated though research, simulation, and testing for their impact on required outcomes?	Yes	
Are options prioritised, planned and resourced based on efficiency and impact on required outcomes?	Yes	
Do options take account of associated risks?	Yes	
Is implementation of options coordinated and systematic?	Yes	
Does the risk management system reduce the likelihood of risks or their impact on the implementation of options?	Yes	
Are results analysed against modelled scenarios?	Yes	

Question	Yes/No	Notes
Do we use this analysis to continuously improve the business model?	Yes	
Is analysis used to improve forecast accuracy?	Yes	

Stewardship builds trust

Question	Yes/No	Notes
Are the organisation's values stated and available to all internal and external stakeholders?	No	
Are different stakeholder interests aligned?	No	
Are environmental factors considered during investment appraisal?	Yes	
Is reputational risk considered during strategic decision-making?	Yes	
Are relevant employees and business partnerships made aware of their accountability for plans?	Yes	
Are critical thinking and challenge encouraged as plans are being created?	Yes	
Are plans made available on a timely basis to those who may be affected by those plans, for relevant scrutiny?	Yes	
Is the impact on long-term value considered when decisions	Yes	

Question	Yes/No	Notes
about short-term activity are made?		
Is behaviour that falls short of expectations immediately challenged?	Yes	
Does the organisation have a robust internal audit function?	No	
Is a control environment fostered?	No	
Are the relevant stakeholders made aware of any breaches to standards in a timely manner?	No	
Do employees proactively seek feedback?	No	
Are audit trails maintained and made available for scrutiny?	No	
Are individual performance targets pegged to long-run value generation rather than short-term outcomes?	Yes	

7.2.3 Section 3: Principles and Practices

Do your business and account resources (and to what extent, if applicable):

Practice Area	**Question**	**Notes**
Cost Transformation and management	Understand the drivers of cost across the organisation?	Yes
	Aid the improvement of value-chain efficiency?	No
	Develop cost targets in conjunction with relevant parts of the business?	No – price-taker with no power over the market
External Reporting	Encourage the organisation to consider reporting as a value-creating activity that is driven by integrated thinking?	Yes – The performance information is paramount to operation's success No – since external stakeholders are limited to compliance relationships
	Report information that is regularly presented to the board of directors in the context of strategic targets?	No, but also not applicable
	Ensure that reports comply with regulation and governance?	Yes, IFRS for SMEs

Practice Area	Question	Notes
Financial Strategy	Source funds efficiently?	Yes – 100% in the context of ownership
	Appraise investments?	Yes
	Design and implement dividend policy?	Not applicable
	Control working capital?	Yes
	Optimise capital structure?	Targeted structure is 100% owner funded. Reality is requirement of both owner funding and debt.
Internal Control	Manage, supervise and report on the framework of systems, processes and procedures that provide confidence in the safeguarding of resources?	To the degree that operations manager reports to bookkeeper that reports to Owner-A.
Investment appraisal	Perform relevant calculations and analysis to determine the quantifiable value to the organisation of pursuing a particular investment?	Yes
	Understand all the risks that need to be factored into the	Yes, use more than one source

Practice Area	Question	Notes
	appraisal?	
	Provide real options to decision-makers about which opportunities should be exploited or avoided?	Yes – e.g. maize vs soya and pigs vs lambs
Management and budgetary control	Monitor and report financial and operational performance against planned targets?	Targets are set for maize and pork and are measured, but financial performance is not analysed against a set target.
Price, Discount and Product decisions	Analyse target markets to set target price and margin, and therefore target cost?	Not applicable
	Understand which cash flows are relevant for inclusion in calculations to determine prices?	Not applicable
	Know the business model and where a particular product or service fits within it, aiding market positioning?	Not applicable
	Translate complex numbers into understandable recommendations to facilitate decisions about the allocation	It informs business decisions such as whether to continue or discontinue a specific farming

Practice Area	Question	Notes
	of funds to specific products and services?	activity
Project management	Provide financial scrutiny to project plans, budgets and spending?	Yes, this is considered with every capital project.
	Ensure projects are adequately resourced and that their purpose fits with the organisation's strategic priorities?	Yes
	Communicate project processes to get effective buy-in from relevant stakeholders?	Communicate with bank (debt provider) – full economic model within a business plan
Regulatory adherence and compliance	Monitor the regulatory landscape to understand current and future developments and their potential impact on the organisation?	Yes, reference was made to a recent tax situation
	Calculate and assess the costs of compliance and non-compliance?	Not done.
	Ensure the organisation approaches compliance within both the letter and spirit of the law?	Trying as best as can be done.

Practice Area	Question	Notes
Resource management	Give due consideration to the priority of scarce resource availability?	Yes – example of specific scarce feed to supplement pigs' diet
	Produce resource maps that highlight requirements, returns and options?	Yes for the piggery
	Understand the opportunity costs and comparative advantage impact of differing resource allocations?	Yes – referring to opportunity cost of consuming maize harvested via piggery vs selling it on the market
Risk management	Identify the risks and advise on appropriate responses that are relevant and proportional to the size of risk, the organisation and its environment?	Yes
	Embed risk management within their thinking and consider it alongside planning and performance?	Applicable to operational processes, but not financial processes.
	Support non-finance colleagues to assess the probability and impact of all organisational risks and to determine appropriate responses?	Not applicable

Practice Area	Question	Notes
Strategic tax management	Advise on transfer pricing policy?	Not applicable
	Calculate the tax implications on capital investment decisions?	Yes
	Communicate project processes to get effective buy-in from relevant stakeholders?	Full economic and business model submitted to debt provider
	Act as an ethical conscience of the organisation?	Not applicable
Treasury and cash management	Provide information from the balance sheet and cash flow statements as required by treasury colleagues?	Not applicable
	Produce accurate cash flow forecasts?	Yes
	Manage financial risk?	Yes, very active management of cash flows and liquidity.
Internal audit	Facilitate the efficient delivery of assurance by providing cost-benefit analysis for the internal audit and control functions?	Not applicable
	Encourage continuous appraisal and revalidation of	Not applicable

Practice Area	Question	Notes
	accounting and internal control systems?	

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TO WHOM IT MAY CONCERN

LINGUISTIC REVISION OF MINI-DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

MAGISTER COMMERCII IN MANAGEMENT ACCOUNTANCY

AT THE POTCHEFSTROOM CAMPUS OF THE NORTH-WEST UNIVERSITY

for

MR AB BURGER : Student number: 26065045

I, Magda Burger, ID number 521006 0038 080, hereby declare that I have linguistically revised the mini-dissertation "An Evaluation of Global Management Accounting Principles in the Sustainability of a Mechanised Piggery" for student AB Burger, student number 26065045.

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