Strategies to link smallholder pig farmers to formal markets for enhanced livelihoods in Goromonzi district, Zimbabwe.

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DEDICATION

To my late mom (Mabel Ngirande) your and care still live; and to my love, wife and best friend Chipo, receive my pure and unconditional love.

ACRONYMS

AGRIBANK	Agricultural Bank of Zimbabwe
COTTCO	Cotton Company of Zimbabwe
CSC	Cold Storage Company
FAO	Food and Agricultural Organisation
FTLRP	Fast Track Land Reform Programme
GDP	Gross Domestic Product
GMB	Grain Marketing Board
GOZ	Government of Zimbabwe
LSCFZ	Large Scale Commercial Farmers of Zimbabwe
MoAMID	Ministry of Agriculture, Mechanisation and Irrigation Development
NGO	Non-Governmental Organisation
SHFs	Smallholder Farmers
ZIMASSET	Zimbabwe Agenda for Sustainable Socio-Economic Transformation
PAPP	Zimbabwe Association of Pig Producers
PIB	Pig Industry Board
CFU	Commercial Famers Union of Zimbabwe
ZFU	Zimbabwe Farmers Union
ZWSLFT	Zimbabwe Women and Small Livestock Farmers Trust

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SUMMARY

The research aimed at identify strategies to link smallholder pig farmers into formal markets for enhance livelihoods. Current production and marketing channels, marketing constraints facing smallholder farmers, institutional constraints facing other stakeholders in the pig value chain of Goromonzi district and how these constraints each stakeholder faces affect effective participation of smallholder pig farmers into formal markets were analysed. A total of 30 smallholder pig farmers (small-scale commercial and small-scale semi subsistence farmers) were selected from five wards of Goromonzi district. Data collection was done using secondary data from literature, and primary data through key informant interviews with stakeholders and service providers, focus group discussions, observations and; a survey using a structured questionnaire administered to smallholder pig producers. Depending on the type of data, value chain mapping, stakeholder matrix and content analysis were used for data analysis. Results from the study revealed that there were mainly three pig value chains in Goromonzi district that farmers used as marketing channels. The first chain comprises of stakeholders such as service providers smallholder farmers, processors, wholesalers and retailers and finally consumers. The second chain comprises of service providers, the farmer, the processor and back to the farmer and to the final consumer. The third chain comprises of the service providers, the farmer and consumers.

Responses from the majority of farmers showed that they were not satisfied with the producer price thus their main market was through the informal marketing channels. Constraints included poor road and housing infrastructures, lack of access to markets and poor market linkages with other key players and service providers in the chain, high incidences of disease outbreaks, lack of technical knowhow on pig husbandry and marketing, lack of marketing information and long distances between producers slaughtering and processing facilities. Farmers complemented their pig production with maize production for stockfeeds; some opened their own local butcheries due to poor access to markets and others ventured into tobacco, beef and poultry production as a way of reducing risks in times of poor producer prices pork. Therefore, it can be concluded that market linking strategies that smallholder pig farmers could use include formation of producer (farmer) organisations or cooperatives and similar forms of collective action which are able efficiency in both production and marketing of pigs. Contract farming also was highlighted as one of the mechanisms that can improve smallholder farmers' participation into markets. Training facilities and credit facilities should be availed to farmers for them to be competitive. Market elations among players should also foster so that there information flow from one actor to the other. Government should also improve the road infrastructure and help smallholder farmers to access loans from banks. Membership with farmers' organisations such as PIB, Zimbabwe

Farmers' Union, Pig producers Association of Zimbabwe should create market linkages between farmers and market players in the value chains. Recommendations were that future researches should focus on the need to strengthen the coordination of chain players by understanding the whole pig value chain as a link between farmers and financial institutions and inputs providers and service providers. There is need also to promote vertical coordination through dialogues between actors and traders at different chain level for mutual understanding to determine prices for pork and pork products and linking member farmers for services and markets. Lastly, further research should also focus on how the structural adjustment and the fast track land reform programme affected the pig value chain in Zimbabwe.

Key words: smallholder farming, value chain analysis, market access, constraints, strategies.

1. Introduction

Throughout the developing countries, smallholder pig production forms an important source of animal protein and immediate cash requirements among the smallholder farmers, especially during drought periods (Chawatama et al, 2005; MoAMID, 2010; Halimani et al, 2012). In Sub-Saharan Africa, pigs have the potential to contribute to meat consumption and improved livelihoods in the smallholder communities and the economy (Styger 2002; Kanengoni et al., 2002; Bossio, 2009). Moreover, the importance of smallholder pig producers in these countries has also been greatly recognised in recent years as a way of boosting Africa's agricultural economies (Barham and Chitemi, 2008). On the other hand, over 70 percent of the people in Sub-Saharan Africa are poor and live in areas with poor market access, food insecurity and low levels of household income (World Bank, 2008).

Proponents of agriculture in Africa highlight that agricultural development requires engaging smallholder farmers and that the major obstacle for smallholder farmers is lack of market access, therefore for them to thrive in the global economy there is need to shift from production-related programmes to more market-oriented interventions (Magingxa and Kamara, 2003; Diao, X., Hazell, P., 2004; Dorward et al., 2003; Lundy et al., 2002). This is more important because smallholder farmers account for the majority of actors in the sector and may lead to increased incomes, food security and rural employment (Barham and Chitemi, 2008).

In Zimbabwe pigs in the smallholder sector, which are estimated to comprise about 80% of the total pig population, have the main function of ensuring food security and improved livelihoods (Mutambara, 2013). They are kept for various uses including meat (Peden et al 2009), complementing cropping activities through the provision of manure for soil fertility maintenance, cash sales and other socio-economic functions (Bossio, 2009 Barrett, 2008). Smallholder pig production has the potential to improve their livelihoods if they could get access to new husbandry technical assistance and new market opportunities (Munyeche et al, 2011). This is more important in the case of Zimbabwe since about 70 percent of the population reside in rural areas and depend on small-scale farming for livelihoods (Mutambara, 2013). Furthermore, over 90 percent of the farming systems now comprises mainly non-experienced, smallholder farmers who are not so market-oriented (Mutambara (2013), compared to the former agricultural system before the FTLRP where over 40 percent of agricultural land was being utilised by experienced and trained commercialized farmers who were producing mainly for the market(USAID, 2010).Furthermore, a research by Mutambara (2013) in Zimbabwe revealed that currently the pig industry supplies approximately just above 100 000 animals per year for slaughter and processing. However,

these figures exclude the pigs in the smallholder sector, which are estimated to comprise about 80 percent of the total pig population. Why are smallholder pig farmers not involved in the formal pig high value chain? This question calls for a research to find the reasons why smallholder farmers are not involved in the formal value chains.

Over the years, improving smallholder farmers' access to markets has become an essential element in strategies to promote rural development and poverty reduction (Fischer and Qaim, 2010). However, many of these smallholder pig producers face constraints such as lack of access to market information, skills and technologies in the supply chain, poor infrastructure barring access to urban markets, weak institutional arrangements, and limited capacity to produce high quality products required on the formal markets. All these constraints result in high transport and handling costs (Lapar et al, 2006; Degado and Tiongco, 2005; Gulati et al. 2005).

According to Ton et al (2014) many countries in Southern Africa have agricultural policies and poverty reduction strategies that support the inclusion of smallholders in markets. However, the governance and implementation of these strategies and policies is still lacking. Therefore, there is need to address these multiple market failures that smallholder sector encounters for the success of these development programmes. There is need to come up with intervention strategies that acknowledge the involvement and effective participation of smallholder pig farmers in the pig high value chain for them to gain access to lucrative markets. Pro-active and innovative strategies that promote the inclusion and empowerment of smallholder farmers through increased participation in the growing formal markets for high-value meat and meat products are needed. These require significant vertical integration of smallholders to processing and marketing firms (Delgado and Siamwalla, 1997; Mudyazvivi et al, 2010).This study provides an empirical analysis of strategies to link smallholder pig farmers in Goromonzi district, Zimbabwe. The findings will not be useful only for smallholder farmers in this district but also to all the smallholder pig farmers with the same production and marketing constraints. The study will contribute to debates such as whether smallholder farmers will be able to adapt globalization which requires the need for various forms of vertical coordination (Minot et al, 2009).

1.1 Problem Statement

Currently many smallholder pig producers face many constraints to participate in formal markets for pigs and pig meat. These include low levels of production technology, high disease incidences, limited financial resources and skills, and poor market information and infrastructure. Furthermore, there are weak linkages between smallholder producers and

market actors, resulting in high risks in production and marketing. Lack of access to formal markets results in high input, transaction and low price output costs. The latter is worsened by the limited bargaining power that smallholder producers have in the high value chains.

1.3 Research Objective

The objective is to identify strategies that link smallholder pig farmers into formal markets for enhanced livelihoods, using Goromonzi district in Zimbabwe as a case study.

Research Questions

To achieve the above objective, the following research questions have been formulated.

1. Who are the key players and service providers involved in the Goromonzi pig value chain and what role do they play in the chain?
2. What are the constraints being faced by the immediate chain players and how these constraints are affecting the effective participation of smallholder farmers into markets?
3. Which strategies has each chain player implemented to improve the participation of smallholder pig farmers into formal markets?
4. What are the strategies for linking smallholder pig farmers into formal markets for enhanced livelihoods?

2. Background

Agriculture is the backbone of Zimbabwean‘s economic stability and growth, providing livelihoods to almost 70 percent to the national population (DBSA 2012 Chawatama et al, 2005; FAO, 2003)). Agriculture contributes about 60 percent of all raw materials to the agro-processing industries, 40 percent of the country’s export earnings and contributes significantly 18-20 percent to the Gross Domestic Product (GOZ, 2013; Kapuya et al 2010; Mutambara, 2013). Furthermore, agriculture provides employment for about one-third to those in the in formal labour force (MoAMID, 2010).

Prior to the year 2000, Zimbabwe’s agriculture was highly dualistic in nature, comprising of large-scale commercial farmers (dominated by white farmers) and the smallholder sub-sector. The later comprised of small to medium-scale commercial farmers, resettlement area farmers and communal areas, predominantly in the drier areas (FAO, 2012; World Bank, 1995). Following the fast track land reform programme in 2000, the former large-scale commercial farms were subdivided into smaller units and allocated to new farmers (Moyo, 2011). This resulted in the creation of small to medium-sized land holdings from what were previously large scale commercial farms. Two new models of resettlement were established. Model A1, in which each household would be allocated at least 3 ha (maximum 5 ha) of arable land, but with shared grazing; and. Model A2 schemes based on small, medium and large-scale commercial farms with 99-year leases (Moyo, 2006). However, since the land reform in 2000, production is still marginal on the A2 resettlement farms (which replaced the large-scale commercial farms); even though it is based on large land sizes and focuses more on commercial production (Sukume & Guveya, 2009). The communal system on the other hand, focuses on communal production and usually for family consumption and use of family labour while (Moyo, 2011a, b). Currently, Zimbabwean agriculture is now dominated by small scale farmers, characterized by low productivity and uncompetitive production systems, poor market access and poor market linkages (FAO, 2012).

2.2 Livestock production

Livestock and fisheries play an important role in the national agricultural economy and sources of animal protein to achieve balanced diets. Livestock also contributes about 40 percent of the agricultural GDP (MoAMID, 2009). Most importantly, for the rural communities who constitute almost 70 percent of the national population, livestock agriculture is central to this rural economy in the context of income generation, food security and livelihoods improvement and also by acting as an insurance in times emergencies such as droughts (MoAMID, 2010; Mudavanhu and Mandizvidza, 2013; FAO, 2011). Meat consumption patterns have also significantly changed over the last 20 years towards cheaper sources of protein. According to ZPA (2013) and Mudzonga (2009b) consumers gradually shifted from

the pricey beef meat to cheap chicken meat and pork. ZIMSTATS (2013) also revealed that annual per capita expenditure in Zimbabwe during 2011-2012 showed that 30 percent was spent on animal products. Out of the total of 30 percent , beef accounted for 35 %, followed by poultry products (32%), fish products (17%), dairy products (3%) and sheep and goats (3% and 2%), respectively. In addition, the estimated overall meat consumption per month ranges between 6 000MT and 7000 MT, with beef demand around 1,000 MT, chicken 3,500 MT, and other meats, pork inclusive 2,000 MT (Matashu, 2010; Mutambara, 2012).

The livestock sector has however, continued to experience severe declines in production and marketing (DBSA, 2012; Mutambara, 2013). In the last two decades, agricultural sector went through some structural adjustment market oriented reforms, growth with equity. For livestock farmers, the emergence of new players into the livestock sector, who benefited from the fast track land reform in 2000, had an impact on the outlook of the smallholder livestock supply chains in Zimbabwe (Mujeyi, 2010). Moyo (2012) as cited by Mutambara (2013) argued that the decline in the agricultural productivity in Zimbabwe was largely due to the shortages of inputs that affected all the categories of farmers, rising input costs, and inadequate credit, incomes, savings and wage remittances.

Moreover, lack of relevant and well-defined policy and institutional frameworks due to economic crisis, led to deregulation of producer prices in the marketing of all agricultural commodities since 2009 (FAO, 2012; LPD, 2011;Kapuya et al., 2010). The implementation of these new agricultural policies resulted in the formation of new livestock markets, market relations and opportunities and marketing channels for agricultural services, livestock inputs and outputs. Low productivity particularly in the smallholder livestock sector became more prevalent due to lack of both domestic and foreign investments into agriculture, with deteriorating economic conditions, periodic droughts and over-reliance on rain-fed agriculture. Furthermore, the smallholder livestock agriculture has been non-competitive due to high costs of inputs such as stockfeeds, drugs and antibiotics; high transaction costs , lack of proper marketing infrastructure coupled with poor market linkages between smallholder farmers and key players and service providers in the value chains; and ineffective marketing policies (FAO, 2012). This has resulted in devastating low productivity and low outputs.

2.2.1 Pig production in Zimbabwe

In Zimbabwe, pig production plays important roles in the provision of balanced diet for human consumption while generating income for almost 80 percent of most of the smallholder farmers who derive their livelihoods from agriculture. However, over the years, like any other livestock sector in Zimbabwe, pig production has been declining. According to Mutambara (2013) the national commercial sow herd picked at 20 000 sows in 2007 from 15500 in 2005,

but then declined by almost half to about 8000 in 2008. Although, pig numbers have been rising steadily, estimated to be about 10000 sows as of 2013 (Figure 1), these figures however, exclude the pigs in the smallholder sector, which comprises of approximately 80 percent of the total pig population in Zimbabwe (USAID, 2010).

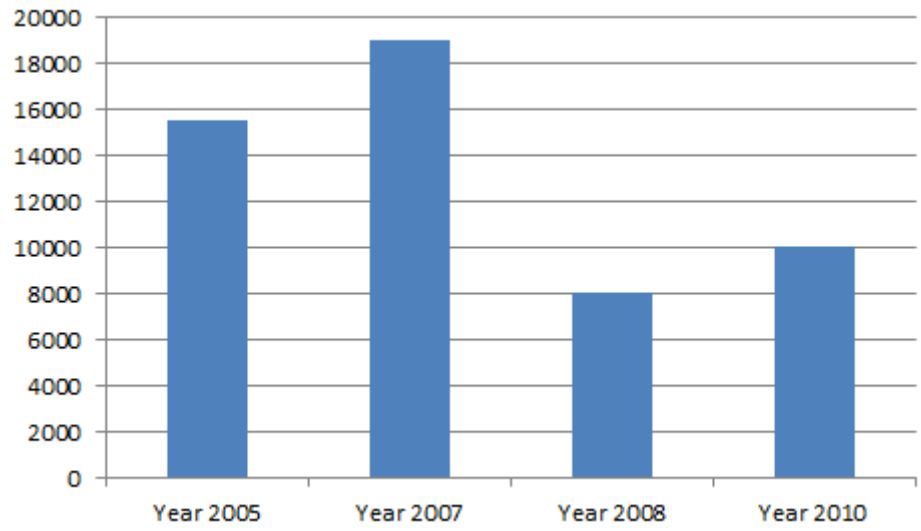


Figure 1: Trends in National sow herd. *(Source: Mutambara, 2013)*

Current database in Zimbabwe show that the pig industry supplies approximately above 100 000 animals per year for slaughter and processing and this is a major increase compared to those recorded in 2008 (Figure 2). Out of the 100 000 pigs slaughtered and processed, Triple C, one of the largest commercial farm and division of Colcom foods, Zimbabwe's largest slaughtering and processing, supplied 57,646 pigs in 2013, above 50 percent of the total slaughtered pigs (Colcom annual report, 2013. This domination affects participation of smallholder sector in these value chains.

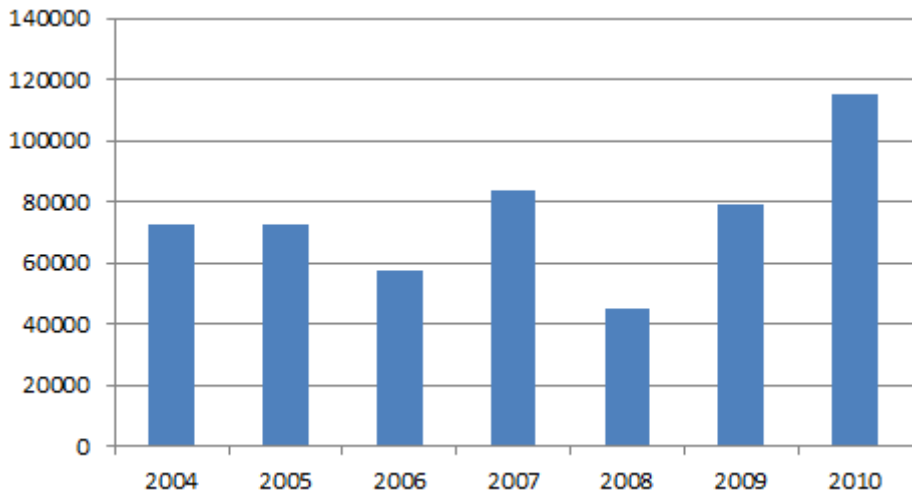


Figure 2: Annual slaughter of pigs *(Source: Mutambara, 2013)*

2.2.2 Value Chain Analysis (VCA)

A commodity value chain analysis refers to the range of all activities involved in the design, production and marketing of a product (Gerriffi, 1994; 1999). Since many development interventions now utilize the value chain approach as an important entry point for engaging small farmers, individually or collectively, in high-value export markets, understating this approach is of crucial importance as it helps to achieve the main objective of this research. Kaplinsky and Morris (2001)Vermeulen et al, (2008), refers to value chain as the full range of activities that are required to bring a product (or service) from conception through different phases of production to delivery to final consumers and disposal after use. Roduner (2007) highlighted that value chains analyses the links and information flows within the chain and reveals the strengths and weaknesses in the process. The value chain concept was therefore used in this research to investigate and analyse the strengths and weaknesses of some key actors from pig producers through processors and to see how they can improve effective participation of smallholder pig farmers to markets

The objective of value chain systems is to position organizations in the chain to achieve the highest levels of consumer satisfaction and value while effectively exploiting the competencies of all organizations in the particular value chain (Brown, 2009). The use of this approach in this study was to understand power relations and constraints of some key players in the pig value chain of Goromonzi district. The selection of the research area was based on the fact previous researches revealed that smallholder farmers were failing to access markets, there were poor linkages between producers and other players in the pig value chains coupled with domination of the large-scale white commercial pig producers in the formal markets. Furthermore, today markets are fast changing, competition is becoming fierce and to stay in business, actors particularly smallholder farmers need to make sure that their products meet the changing market/consumer requirements and demands for them to be competitive on the market. Understanding the dynamics and domains of the value chain analysis such as the institutional set up, economic, functional analysis, output market helps the researcher to come up with a desired market structure and to come up with interventions that help in overcoming market entry barriers.

Value chain development

There are strategies that can be used and these are vertical and horizontal integration. According to KIT et al (2006) vertical integration involves farmers in new activities either upstream or downstream e.g. production, processing or trading. Vertical integration may occur for several reasons including; better quality control, improved information flow, stable supplies, scheduling and reduction in price risk. On the other hand horizontal integration refers to the involvement of farmers in chain management with regards to decisions on sales,

price, quantity and customers. Horizontal integration also provides uniform quality performance by supporting members through quality programs and by providing members with quality demand information from the market.

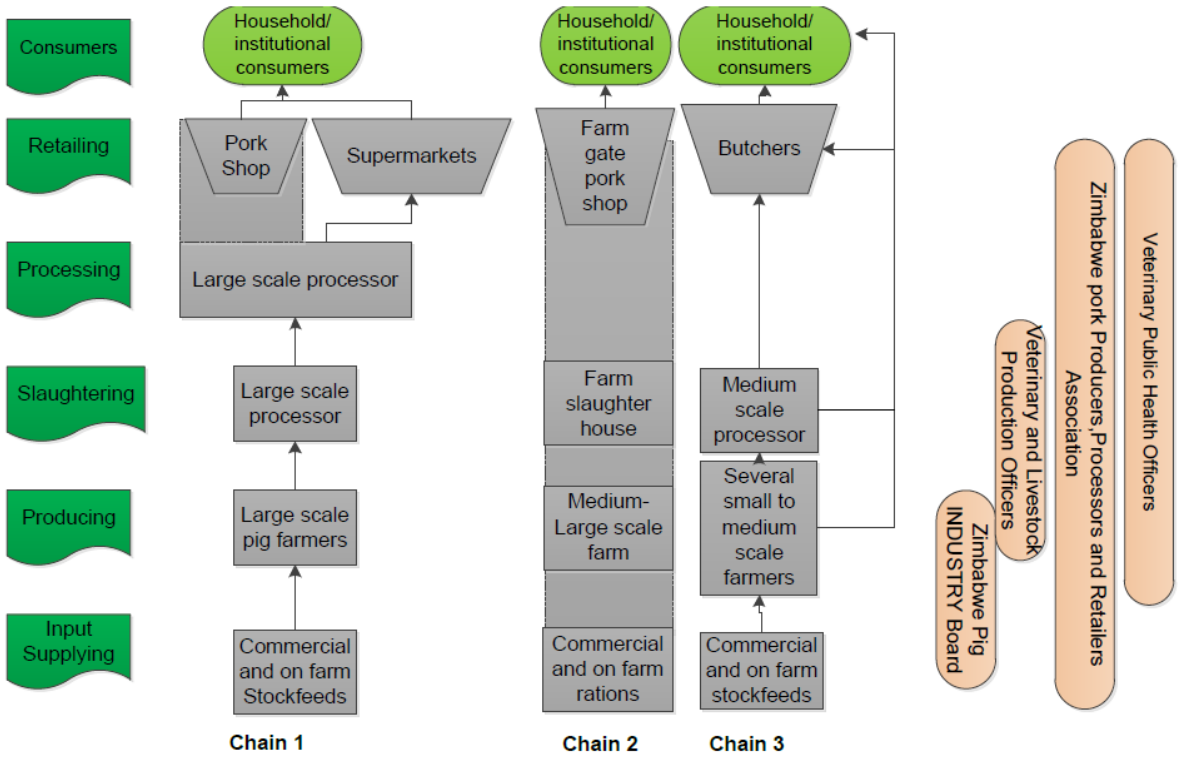


Figure 3: Pig value chain in Zimbabwe: *(Source: USAID, 2010)*

There are currently three pork value chains responsible for the supply of pork consumed in Zimbabwe. The value chain players in the pig industry in Zimbabwe work as a network of interconnected units to ensure delivery of pork and pork products for consumption in the domestic and international markets. These value chains comprises of input supply, producers, feed manufacturers, abattoirs, processing wholesalers, retailers and consumers. Service providers include other players who facilitate activities along the value chain to ensure product delivery such as farmer organizations and veterinary services, health inspectors and others. Figure 4 above shows various players and service providers in the pig value chains that are found in Zimbabwe.

Chain 1- is the formal marketing channel of pork and pork products that has been in existence for many years in Zimbabwe. Pig producers, mainly the large-scale white commercial farmers and processor (Colcom, Montana Meats and Caswell Meats) are vertically linked and enjoy economies of scale. Processors such as Colcom in this value

chain have a backward vertical integration where Triple C, the largest commercial pig farm is a subdivision of Colcom). Customers are mainly the large supermarkets and institutions, large hotels and restaurants in the country.

Chain 2- mainly comprises of a single actor taking all the value chain functions. Producers in this chain are mainly small-medium large scale commercial pig farmers who have butchers, vendors as main customers but also serve consumers directly at farm gate (Figure 4).

Chain 3-is the most fragmented one, with more actors at each chain level and the pork product peels off to the consumers at different stages of the value chain as shown in Figure 4. The main customers of this chain area the butchers, takeaways, small pork shops and vendors are mainly found in the high density areas.

2.2.3 Producer organisations and smallholder marketing organisations:

Producer organisations (POs) are defined as formal, voluntary membership organisations that are set up for the economic benefit of agricultural producers (members) by providing farmers (producers) with services that support the farming activities, such as bargaining with customers, providing inputs, enabling contractual links, providing technical assistance, redressing missing markets, integrating heterogeneity through providing processing or product standardisation and marketing services (Bijman and Wollni, 2008). Smallholder farmers tend not to be organised in the market, sell their limited produces individually without linking to other actors, and so lack collective action and are exposed to price exploitations (Schalkwyk et al, 2012). These producer organisations range from farmer groups, co-operatives to apex organisations mostly as economic organisations. Through collective action by organised farmers, farmers are able to build up market power and enjoy economies of scale (product bulk buying), reduce transaction costs in markets and mitigate risks associated with individual produce transportation Collective action by organised farmers reduce transaction costs in markets, mitigate risks, build up market power through economies of scale i.e. product bulking and increase representation in policy. These high transaction costs result from individual produce transportation and selling, difficulties in getting trading partners and poor bargaining power (Delgado, 1999) Therefore, POs and collective action can help to enhance farmers competitiveness and increase their advantage and linkages to emerging market opportunities.

In addition to improving the co-ordination of activities among smallholder farmers marketing organisations help to guarantee product quality and safety and enhance the design of market strategies, ensuring that the quality of products is in line with the standard demanded (World Bank, 2002). Market access is achieved through closer coordination of production and reduced information asymmetry to ensure delivery of high quality and homogenous products.

According to (Kranton, 1996) the absence of institutions or co-operatives that help to co-ordinate marketing functions or link producers to the markets, the associated high transportation and high transaction costs undermine the process of exchange and result in limited or localised markets with limited rural urban linkages i.e. low level equilibrium trap. The potential market support institutions that can enhance or leverage market functions or overcome market imperfections in agriculture input and output markets are producer organisations (World development report, 2008). Well organised farmers will be able to bypass brokers or assemblers, rural wholesalers and transporters and connect directly with the urban high value retailers together with processors and exporters done on a contractual arrangement including out grower schemes or post-harvest bulk deliveries. For example adding new functions to horizontally coordinated institutions Newly formed producers‟ groups in Kenya performing grading and packaging of fruits and vegetables at dedicated centres to meet buyer requirements (Ashraf. 2008). In India shortening of chains by the exclusion of intermediaries and redistribution of functions among the partners of a newly formed vertical relationship resulted in direct sales to retailers by fruit and vegetable producers in India, with the supermarkets taking on the transport function and producers bulking and grading at dedicated collection and distribution centres coordinated by farmers‟ groups (Singh 2008; USAID 2008)

2.2.4 Market Access and risks

According to Mwanza (2010), lack of market linkages for the poor smallholder farmers in most Sub-Saharan African countries, poses a significant drawback to market access, resulting in increased transaction costs, post-slaughter costs and reduces market efficiency. Farmers lack assured market with fair prices (Eaton and Shepherd, 2001). In Zimbabwe the structural adjustment and the fast track land reform programme affected producer prices of many agricultural commodities resulting in farmers, particularly smallholders having to rely on selling their produce in the local communities and informal marketing systems (GOZ, 2012; FAO, 2012). The emergence of middlemen increased in informal marketing systems in most smallholder marketing channels. In most cases these systems only work under the conditions unfavourable to the farmer as they are characterised by weak and unreliable information systems on market conditions; limited coordination value chain players and spot market transactions with inadequate mechanisms for risk management. In accessing to new markets the distribution of risks and gains along the value chain is an important aspect in market focused collaborations especially in a rapidly changing business environment. Access to markets and distribution of risks and gains along different steps of livestock value chains varies also according to the gender of producers (e.g. rights to income generated from

livestock); processors (access to processing technologies and information); market agents (access to transportation, safe market spaces and overnight accommodation, risk of sexual harassment and abuse); and according to the economies of scale (bringing women together to improve their market position) (IFAD, 2007). Unpredictable price fluctuations currently affecting the local markets require for strategies that enable market access with other factors of production.

2.2.5 Supply Chain Management

Supply Chain Management (SCM) is defined as the integrated planning, coordination and control of all business processes and activities in the supply chain to deliver superior consumer value at less cost to the supply as a whole while satisfying variable requirements of other stakeholders in the supply chain (Van der Vorst et. al, 2005, Zacharia et al, 2001). For SCM to be efficient there should be a systematic network of suppliers, factories warehouses, distribution centres and retailers; and strategic coordination of the traditional business functions and the tactics across these business functions within a supply chain (Lambert et al,. 2000). This is essential as it improves the long-term performance of individual companies and the supply chain as a whole; saves not only costs and eliminates delays and uncertainties but also makes the business stable during recession and economical turns (Fox 2002). The implementation of SCM helps value chain players to stop attempting to improve their own processes independently but achieve a global benefit ((Bagchi & Skjoett-Larsen, 2005).The coordination and vertical integration relationships that are established among enterprises within the supply chain have competitive advantages of either adding value for the customers or by acting as cost cutting measures. (Cooper et al., 1997; Lambert et al.,1998). The supply chain is not a one-to-one or business-to-business relationship, but a network of multi-business relationships that involve series of physical and decision-making activities connected by products and (product) information flows, that aims to produce value for the end consumer but at the same time being satisfactory to all other supply chain players

Supply Chain Network Structure

Effective supply chain management means all members within the supply chain participate, from the raw materials up until the final consumer or end user. Its management however, depends on several factors which include the complexity of the product, the number of available suppliers, and the availability of raw materials. Depending on the type of the supply chain, some take the form of a pipeline or chain than an uprooted tree, where the branches and roots are the extensive network of consumers and suppliers. How many of these branches are needed to properly managed, closeness of the relationships at different points

and which parts of the supply chain needs management attention depends on the capabilities of the firms. This also means that not all links throughout the supply chain should be closely coordinated and integrated.

Governance Structures in Supply Chain

Chain governance refers to the institutional framework in the supply chain where transactions are carried out (Zhang and Aramyan, 2009). Williamson (1996) defines governance structures as the institutional matrix within which transactions are negotiated and executed. He also stated that the purpose of governance mechanism is to provide, at minimum costs, the coordination, control and trust that are necessary for chain actors to believe that engaging will make them better off (Williamson, 1985). The governance of the chain is a key factor in this transformation. Therefore, the role of governance structures in supply chain management is essential. Below is the figure that shows governance structures on a continuum, ranging from market based coordination to hierarchical forms of coordination.

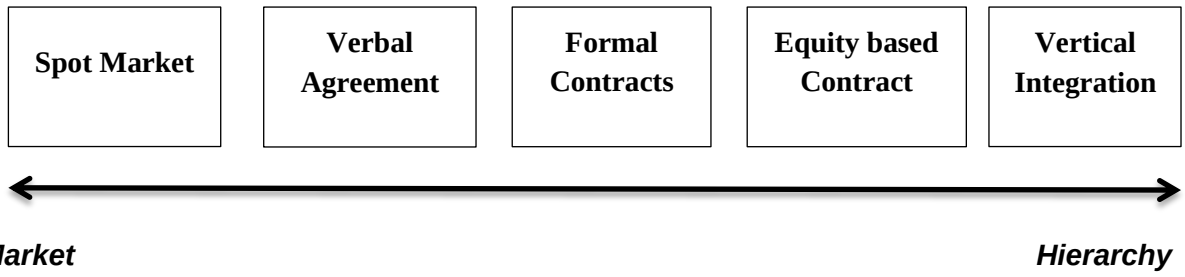


Figure 4. Typology of Governance Structures *(Source: Wever et. al, 2010).*

Smallholder farmer supply chains

Globally, and more so, in the developing world, the various links of primary producers with markets, include: farmer to local trader; farmer to chain retailer through intermediary (trader or lead farmer); farmer to chain retailer through NGO; farmer to chain retailer through farmer co-operative or association; farmer to chain retailer with formal contract farming; farmer to chain retailer with informal contract farming; farmer to chain retailer without contract (only 'contact'); farmer to processor with formal contract farming; farmer to processor without formal contract farming; farmer to processor through intermediary (trader or lead farmer); farmer to market through co-operative or group; farmer to exporter (direct); farmer to exporter through intermediary; farmer to dedicated wholesaler; farmer to consumer.

Market access for small producers depends on: (a) understanding markets; (b) organisation of the firm or operations; (c) existence of communication and transport links; and (d) an

appropriate policy environment (Page and Slater, 2003). Understanding markets in a modern context involves understanding value chains, networks, and their dynamics from a small-producer perspective. The functioning of traditional markets needs improvement to enhance cost efficiency so that producers and consumers can realise better prices; provide better facilities such as cold storage, and improve farmers' access to market information. These markets are important to small farmers and even a significant proportion of medium and large farmers, who still depend on them; they also serve as the main competitors to contract farming and can improve the terms offered to contract growers (Singh, 2008). There is a need to combine value chains promotion with a livelihood perspective to enable the resource poor to enter into and remain in globalised commercial markets.

Integrating smallholder farmers into modern supply chains has been identified as a way to address the ongoing debate about whether small scale farmers can ever be and how they might be part of a modern supply chains. Prior research by Elizabeth et al. (2000) and Dolan and Humphrey (2001) suggested that smallholder farmers tended to be excluded from the modern marketing chains.

Moreover, many smallholder farmers in the developing world face a lot of challenges in trying to reach both domestic and global markets for their produce. Linking these small primary producers with markets has been identified as one of the major issues in policy and practice in improving livelihoods for millions of poor in the developing world (Singh, 2010). Implications highlighted as negative impacts include difficulties for small and marginal farmers to meet the quality specifications because of investments in physical assets, infrastructural development facilities, logistical problems and also quality requirements issues. However, it is also evident that special efforts and projects can be undertaken to bring small and marginal farmers in modern value chains. This is because selling to supermarkets is different from business as usual for the farmers. Development strategies have to focus on preparing farmers to take advantage of the new changes resulting from technological advancement and innovation strategies. In addition, meeting the quality requirements will enable procuring from the region for exports as well as domestic supply (vice versa) and also it is important if governments invest in technical training and marketing extension for farmers. Therefore, there is need to provide a framework that integrate these smallholder farmers in the modern supply chains. Therefore, their involvement can be achieved first by identifying their constraints and trying to mitigate them. Figure 5 illustrates the different types of supply chains in the developing world.

Problems that Affect smallholder farmers in Traditional Markets

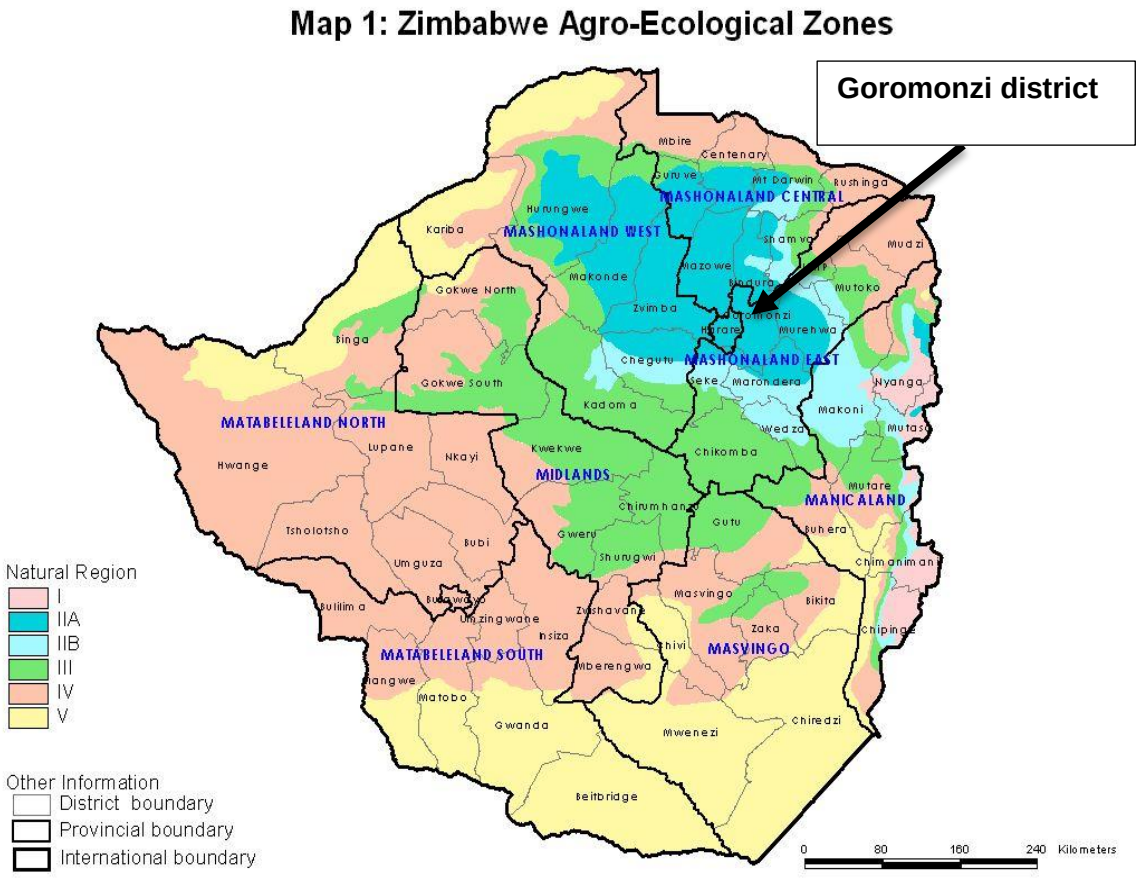
The major problem lies in small-scale production is difficult to produce homogeneous products. Imperfect land markets hamper the transfer of land use rights to other families. Small scale production is not attractive enough to keep young generations at the field. Lack of public investment in R & D is another weak point, with no technological extension work. Chain governance refers to the ways in which activities along the chain are coordinated, such as how the process is specified and how standards are enforced and monitored. Since the linkage between small-scale farmers and modern traders is of great importance for the fruit chains, the research is particularly interested in how small scale farmers can be integrated in the fruit export chain so we will describe this in greater detail than governance relationships in the rest of the chain. Those problems that they face in reaching formal markets include transport facilities to agreed destinations; failure to meet all the supply needs; product quality issues; small farmers may perform poorly based on their skill sets; and they may do poorly based on land and financial resource limits.

3: Methodology

This chapter presents the study area, study design and data collection strategy and the way the gathered data was analysed. The approach of this research was qualitative based on empirical data collected from primary data which was obtained through questionnaire, Key informant interview focus group discussions and observation. Secondary data was obtained through books, archival document, journals, reports and internet search.

3.1. Study Area

The research will be carried out in Goromonzi district, Mashonaland East Province, Zimbabwe. It is located 32 kilometers south-east of the capital city and the area comprises communal, resettlement and commercial farms (Marongwe, 2008). It is also well known for mining, tourism and urban development. Of these farming systems, commercial farms and tourism were most affected by FTLFP (Chakona, 2010). Goromonzi covers an area totaling approximately 2,459 square kilometers. Overall, 49.7% of the population is males and 50.3% are females. The study area falls into region II (b) and comprises communal, resettlement, small-scale and large-scale commercial farms and agriculture is the main economic activity in the communal lands, resettled and small and large-scale A2 farms and large-scale commercial farms followed by tourism and mining (Chambati, 2013). The main livestock production systems include beef, dairy, pig and poultry (FAO, 2006). The area receives an average of 750-1050mm annual rainfall. The area receives an average of 750-1050mm annual rainfall.



Map 1: Goromonzi district research study

Goromonzi district as a Case study area

Goromonzi district was selected for research because the Pig Industry Board (PIB) research station is located within the region, about 20km to the north east of Harare, the capital city. Having PIB in the research study are offers opportunities for smallholder pig farmers. The PIB has the mandate for the central breed testing and certification among other duties such as nutrition, training, extension and development in Zimbabwe. Therefore, for farmers within the region, it is easy to venture into pig production because the industry, which is the breeding unit for pigs in Zimbabwe, also trains farmers on pig production which is an added advantage for the farmers.

Goromonzi district also lies in the Natural region II (b) under the natural climatic regions of Zimbabwe, and in this region, exotic animal breeds thrive well compared Moreover, since the imported pig breeds cannot survive under harsh environmental conditions (Ncube et al, 2002), which are experienced in most smallholder farming areas of Zimbabwe, Goromonzi district a suitable pig growing region. This is because the district lies in the Natural region II

(a), according to the agro-ecological regions of Zimbabwe; receiving high rainfall and high temperatures with good soil type, In this region imported pig breeds such as Large White, Duroc and Land shire, with high nutrient requirements and the need for intensive management systems are able to survive in such climatic conditions. If the Pig Industry Board (PIB) ventures into contract farming with smallholder pig farmers, as it does to large commercial pig farmers, it would be easier since the industry only contracts farmers who are located within the 60km radius of their breeding unit and first preference is given to those farmers near PIB, which makes Goromonzi the favourable pig growing region. to the poor-resource indigenous breeds which can survive harsh environmental conditions. Proximity to the capital Harare also provides a better platform for the smallholder farmers to explore rural-urban connections in order to have access to new agricultural innovations. The district enjoys and absorbs the effects of urban development.

3.2. Research Strategies

Table1: Research strategies.

Objects	Material	Purpose	Where to gather it
Theoretical	Scientific literature (books, articles, publications, etc.) from main journals,	Answer the RQs of the theoretical part of the rsearch (questions 1)	Libraries: Wageningen University, digital search sources such as Scopus, Google Scholar and from company publications.
	Study books		Library
Empirical	Case study	Answer the RQs of the empirical part of project (question 2, 3, and 4)	Libraries, digital and internet-based sources and company publications
	Key informant Interviews, Questionnaires, focus group discussions and observations		Direct interviews with key informants, semi-structured questionnaires to farmers and focus group discussions

3.3. Research Framework

The research framework defines a graphical representation of all the steps taken to achieve the research objective. The research framework in Figure 7 comprises of four components to

be taken which include the literature review, the empirical analysis, results and finally conclusions and recommendations.

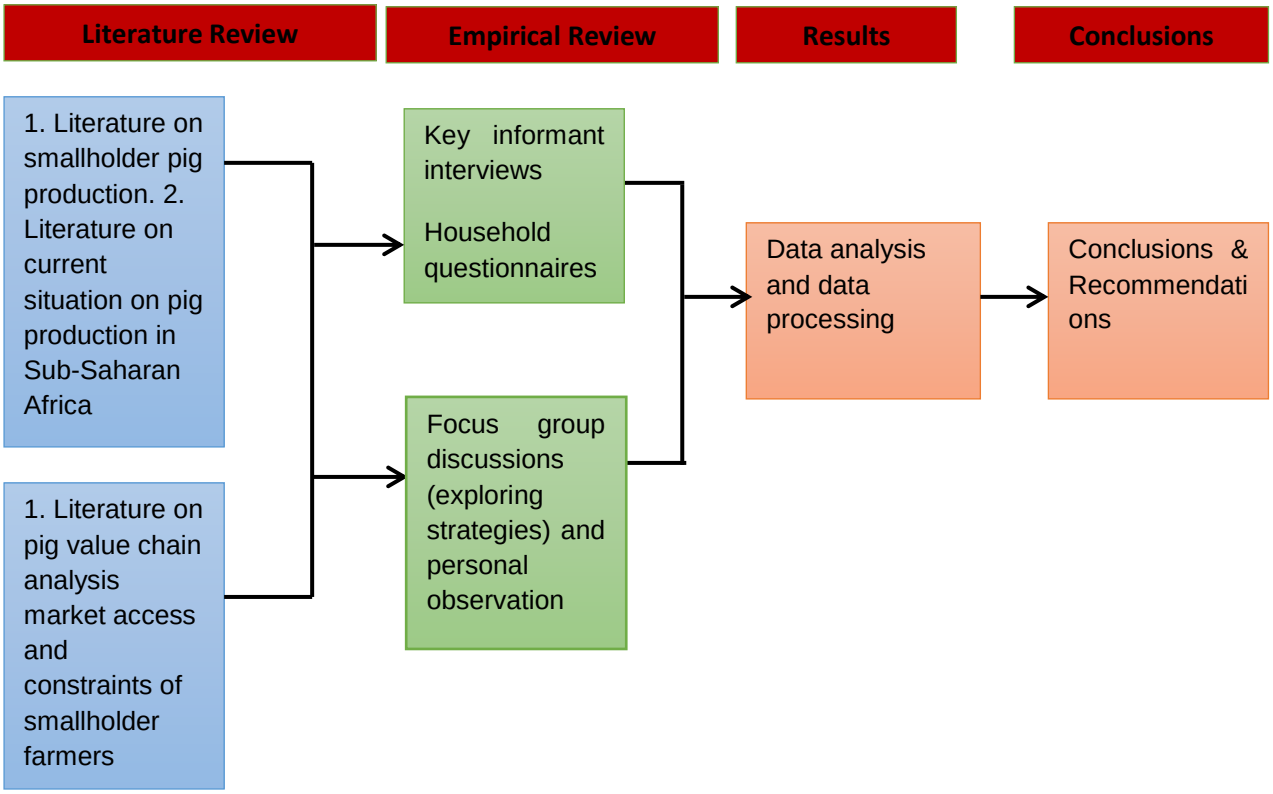


Figure 5: Research framework

3.3.1 Survey

A survey was carried out on smallholder pig producers in Goromonzi district. A total of thirty farmers were randomly selected from wards (16, 20, 21, 22 and 25). There were two categories of farmers (small-scale commercial and small-scale semi subsistence) according to the land size. A structured questionnaire was used to collect information on production and marketing methods being used and also constraints being faced by these smallholder farmers how farmers market their produce. In addition views and perceptions on strategies to link smallholder pig farmers to markets were also gathered demographic data and milk marketing challenges. Pre-testing of the questionnaire was done on three randomly picked consumers at the beginning of the data collection period. Results of the pilot test made the researcher to shift a bit from the original proposed plan. The initial plan was to identify strategies to link smallholder farmers with commercial meat processors but the responses showed that farmers did not have markets at all. This was not favourable as the potential respondents indicated that they would need strategies that link to markets because even their informal markets were not readily available

3.3.2 Key informant interviews

The study involved personal interviewing of the strategically selected actors and supporters of the three pig value chains in Goromonzi as indicated in Figure 8. A checklist was used to guide the interviewer through the different interviews (see annex) of quality control systems used by actors of 3 the value chains. Key informant interviews from 10 key informants included two commercial pig meat processors such as COLCOM Zimbabwe and Pig Industry Board Zimbabwe (PIB); three private abattoirs namely Mutangadura, Koala and Country Harvest; three government departments such as Livestock Production and Development (LPD) and Agricultural Marketing Authority (AMA); and four farm organisations such as Zimbabwe Farmers Union (ZFU), Commercial Farmers Union of Zimbabwe (CFU), Zimbabwe Women and Small Livestock Farmers Trust and Pig Producers Association of Zimbabwe (PPAZ).

3.3.3 Focus group discussions

Two focus group discussions were carried out: one with small-scale A2 commercial (5 farmers) and small-scale semi subsistence (5 farmers). Selection of the farmers was random. The extension worker called for a meeting for each group and we worked with the farmers who attended. The main aim for these focus group discussions was to come up with possible strategies to link them into formal markets. This was done using a checklist to guide the participants in the discussions. Groups were facilitated in order to track of the important issues during discussions.

3.3.4 Observation

The interviews were done at the stakeholder's work premises. Visiting the interviewees gave the researcher an opportunity to observe the practices, activities and status regarding quality assurance and control. An opportunity to validate some of the data given in interviews was accorded and this enhanced the study.

3.3.5 Sample size

Thirty (30) farmers were selected for the questionnaire based on the land size (According to Zimbabwe's production systems). Farmers were classified as A2 small-scale commercial pig producers and A1 small-scale semi subsistence pig producers. The classification of farmers as A1 and A2 comes from the classification done during the FTLRP in Zimbabwe and it has to do with the size of the land owned by the farmer.

- The first category was those classified as small-scale A1 semi subsistence pig producers
- The second category was those under A2 small-scale commercial pig producers.

3.3.6 Desk study

The desk study was done for collection of secondary data through, scientific journals, reports, government publication and books. It was used to get in-depth information on marketing channels, chain relation, value chain analysis, market linkages and trends in the development of formal markets.

3.4 Data processing and Analysis.

Depending on the type of data, value chain mapping and content analysis were used to analyse data. Qualitative data was coded into text segments by assigning labels and then aggregate similar codes into themes. Qualitative data will be was coded into text segments by assigning labels and then aggregate similar codes into themes.

Thematic analysis approach was used to analyse information from participants, key informants and personal observations. Summaries of the interviews from the case studies were processed to make inferences. Data from key informant interviews, and focus group discussions were also transcribed into interview notes, coding key terms coming out of the farmers' interviews as they went through the pig value chain. A Stakeholder matrix was used to identify the actors and stakeholders and their roles in the chain. Furthermore, value chain map was used for mapping the smallholder pig value chains and to identify product flow and the overlays of the chain in Goromonzi district

4: Results and Discussion

The chapter describes findings of the study conducted among 30 smallholder pig farmers in five wards (Ward 16, 20, 21, 22 and 25) and findings from stakeholders in the pig value chains found in Goromonzi district. This chapter presents findings from the research study in two parts. Findings from the survey first followed by findings from the focus group discussions. Although the district is located 32 kilometres from the capital city, Harare, the area is characterised by poor infrastructure and poor market linkages, making it difficult for smallholder farmers particularly those with low levels of production technology to participate in the formal marketing channels.

4.1. Who are the key players and service providers involved in the Goromonzi pig value chain and what role do they play in the chain?

The research study revealed that there are mainly three main pig value chains in Goromonzi district. The first chain comprises of stakeholders such as service providers (feed manufacturers, veterinary services, and technical and extension services), smallholder farmers (producers), processors (Koala, Colcom, Montana Meats and Caswell Meats), wholesalers and retailers (supermarkets and butcheries), and finally consumers (Figure 8). The second chain comprises of service providers, the farmer, the processor and back to the farmer and to the final consumer. The third chain comprises of the service providers, the farmer and consumers. The input suppliers provide various inputs that are needed within the pig production sector and they include pig breeders (PIB, and local breeders), feed manufacturers (National Foods Ltd, Agri Foods, Feed mix and Agrimix) and veterinary services (Vetco and Veterinary Distributors).

The production sector consists of a number of small to medium-scale commercial pig producers and numerous small-scale semi subsistence producers. Farmers have few registered abattoirs that offer slaughter facilities who buy and slaughter pigs at a price based on the dressed weight and grade of the carcass. These abattoirs sell both raw and processed pork meat to wholesalers and retailers and include Koala, Montana Meats, Mutangadura and Country Harvest. In addition, the value chain also consists of several, unregistered and small abattoirs providing pork for the fresh market at irregular times. Wholesalers and retailers of pork comprises numerous local butcheries and supermarkets who buy mainly processed pork (sausages, chops, ribs, tinned, beacon and polony) from Colcom Zimbabwe and raw meat from other abattoirs and farmers who sell directly to consumers.

Service providers within the pig value chain include those who provide training to individual farmers on pig husbandry and management at a fee, veterinary services from both private

and government personnel, extension services, transporters, cash providers, farmer organisations, meat graders and stakeholder organisations who facilitate various roles along the commodity chain. The results also indicated that the pig sector currently is dominated by informal chain players who are excluded from the formal markets. However, meat sold mainly by communal and resettlement farmers, who dominate the sector, is not accounted for (Mutambara, 2013). The diagram below shows key players and service providers in the pig value chains identified in Goromonzi district.

Value Chain 1: Formal marketing channel.

Service providers in this value chain include Pig Industry Board (PIB) which provides training to individual farmers at a fee and also sells breeding stock to farmers; veterinary services from both private and government personnel, extension services, transporters, cash providers, farmer organisations, meat graders and stakeholder organisations who facilitate various roles along the commodity chain. The input suppliers provide various inputs that are needed within the pig production sector and they include pig breeders (PIB, and other local breeders), feed manufacturers (National Foods Ltd, Agri Foods, Feed mix and Agrimix) and veterinary services (Vetco and Veterinary Distributors). The production sector consists of a number of small to medium-scale A2 commercial pig producers and numerous small-scale A1 semi subsistence producers. The small-scale A1 semi subsistence farmers are those who moved from producing mainly for home consumption to market oriented production but still at a very small-scale. Processors within the district include a few registered abattoirs which offer slaughter facilities and/or buy and slaughter pigs at a price based on the dressed weight and grade of the carcass. These abattoirs in turn then sell both raw and processed pork meat to wholesalers and retailers and include Koala and Mutangadura.

Value Chain 2: Semi formal marketing channel

The players in within this chain include service providers, the smallholder farmers (producers), the abattoirs and then back to farmer who will either sell directly to the consumer (Figure 8). Abattoirs such as Country Harvest who only provide slaughter facilities often offer these services to farmers in this chain.

Value Chain 3: Informal market channel

The chain involves service providers, the farmer and directly to the consumer. The farmer slaughters the pigs and sells directly to the consumers through the informal market locally (Figure 8). Farmers do not pay any slaughtering fees and transaction costs as they look for the market locally. Farmers in this marketing channel highlighted that they prefer selling directly to consumers who included local institutions such as the policy and civil servants

working in the area. Most producers indicated that they resorted to the producer to consumer channel because it offers best prices as the both parties tend to negotiate on the price to be paid per kilogram of meat. One of the respondents had this to say:

The cost of stock feed has gone up while the price of pork continues to decline rendering the project to be unviable. We need at least US$3,50per kg as a producer price to break-even. We cannot afford to pay for the production, transport, labour and marketing costs if we are to sell our pigs to these big processors who keep telling us that our meat is of low grade. In the end we rather sell directly to consumers at a credit and they pay us at the end of the month because we can negotiate the price together".

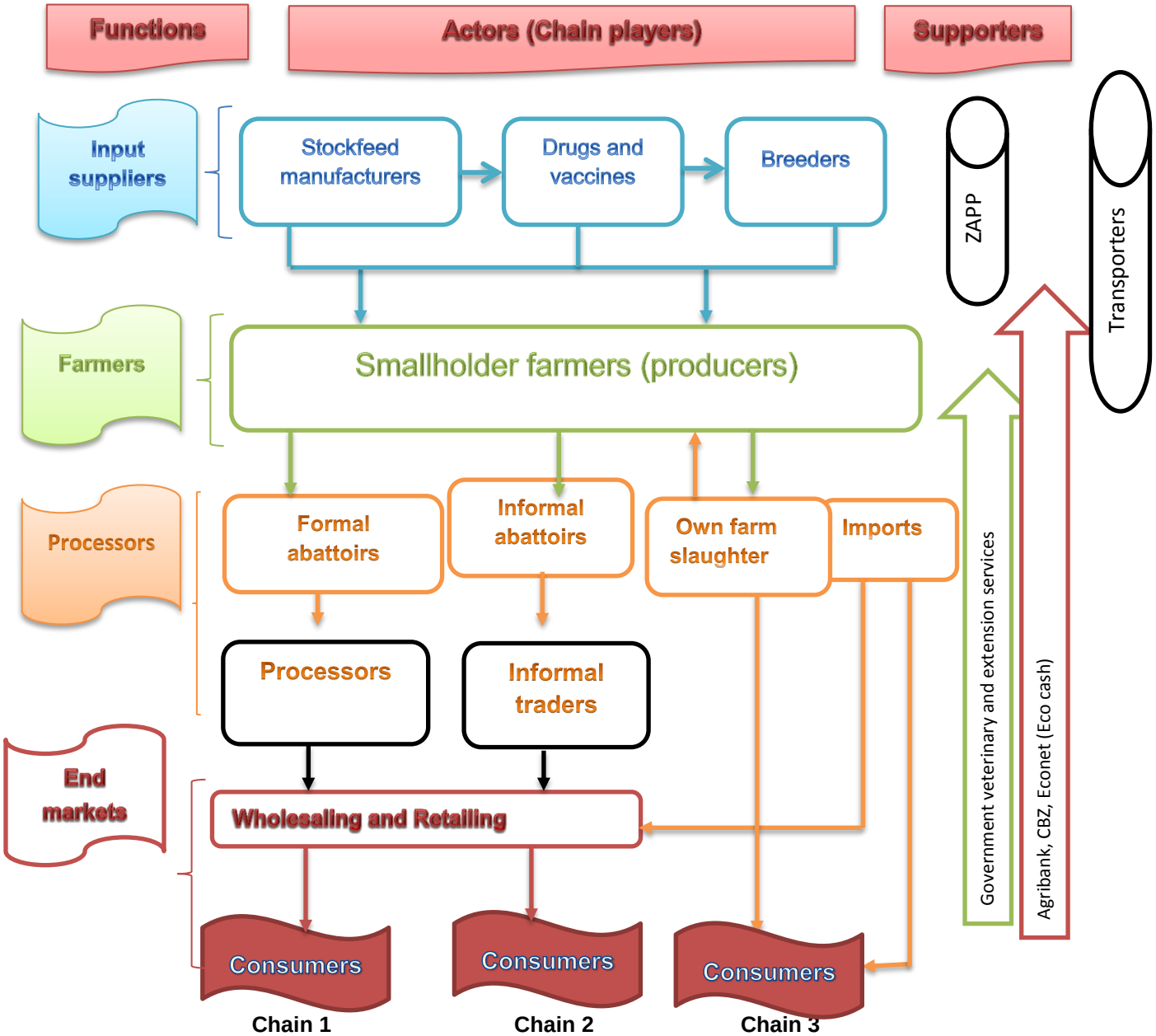


Figure 6: Pig value chains in Goromonzi district

4.2 What are the constraints being faced by the immediate chain players and how these constraints are affecting the effective participation of smallholder farmers in markets?

4.2.1 Constraints for smallholder pig producers.

Stockfeed shortages

The results from the study revealed that farmers face problems of acute shortages and high costs of stock feed for their production. On average a 50kg bag of straight feed was costing US$30 which farmers described unfair price for them. Currently the country experiences massive shortage of stock feed due to high prevalence of periodic droughts and also because maize is used as the stable food in the country. Scarcity-there are times when stock feed companies cannot supply all the farmers mainly due to shortages of maize in the country yet maize forms the main component of pig feed. Due to scarcity the price of the feed also rises resulting in most small holder farmers not being able to afford the feeds and these impacts negatively on pig production. However, a key cost driver for pig production has been the failure to produce surpluses of maize and soya bean for feed production. This has kept the price of stockfeeds excessively high when compared with other competitors in the Southern African region. Sukume (2013) highlighted the high costs of fertilisers as a limiting factor to production of maize and soya bean. During scarcity of stockfeeds in the country, feed manufacturing companies import maize from Zambia and South Africa and this means that the costs of feed goes up but without corresponding increase on the price of the end product. The inadequate availability and high costs of stockfeeds have, however, contributed to the booming of informal and unreliable stock feed industry, sabotaging the pig sector. Therefore, institutional frameworks that govern and control these unscrupulous dealers must be put in place to help farmers be competitive in the formal market channels.

However, this has had negative impacts on the smallholder pig producers who do not enjoy economies of scale and in the end they produce substandard outputs that cannot fetch higher price on the market. Sukume (2013) also pointed out the excessive burden imposed by fees and regulatory procedures from public institutions on the livestock value chains which particularly affect raw material importation which in turn add to the price of stock feed. Therefore there is need for government to streamline these regulations in line with fees that other countries in the region impose so that smallholder farmers are not severely prejudiced. Furthermore, initiatives such as contract farming may help smallholder farmers' access to inputs such as stock feeds. However, current high cost of capital limits the ability of local feed manufacturers to undertake such schemes.

One of the small-scale commercial pig producers had this to say;

Though contract farming can help in ensuring raw material security, the current high cost of capital limits the ability of local feed manufacturers to effectively undertake such schemes.

"I have been a pig producer for about 21 years now and the cost of stock feed has continued to go up due to droughts and shortages of maize in the country while the price of pork continues to decline rendering the project to unviable. On the other hand, the market does not fully support my capacity, they only allow a maximum of 40 pigs per weeks which puts us at risk of running a loss due to extra feed costs and sometimes you have to wait until they accept your booking because the abattoirs. We need at least US$3,50per kg as a producer price to break-even".

Market challenges

Results showed that most farmers did not have access to the formal market and they had to sell their pigs on the informal market which is not reliable. Farmers highlighted that in most cases it can take weeks to sell out 300kg of pig meat. Those that have access to the formal market were complaining of low market prices that are often lower than the production costs. Furthermore most farmers do not have the capacity to regularly provide the required number of pigs in the formal market and this automatically deters them from delivering their pigs to the big processors such as Colcom, Montana Meats and Koala who offer better market prices. Farmers also complained that they do not have access to market information in terms of requirements, market prices and the types of pigs to deliver to the market such as baconners and ham or porkers. As a result of this most of the time they end up delivering the wrong products which do not fetch them a lot of money on market (see first quote from the farmer below).

This is also supported by Alene et al (2007) who highlighted that smallholder farmers especially in sub-Saharan Africa face several barriers that make it difficult for them to gain access to markets and productive assets. One of the major concerns revealed by smallholder pig producers in the study was the domination of the large-scale white commercial farmers on the formal market. Farmers emphasised that they did not any chance to participate in the formal marketing channel as long as the large-scale commercial farmers continue to dominate (see second quote).

Farmers had to say this as shown below.

> *"Market is the greatest challenge as there is no ready market every time we want to sell our pigs or slaughter. I have tried to open my own butchery but things are difficult*

my son in this area. Everyone is crying for money and now one carcass can take a week in the butchery to sell while we wait for that money to buy feed for other pigs. In the end we end up selling the meat on credit to teachers, nurses and police force so that they can pay us month end". We cannot even think of selling the meat to local restaurants because they also keep pigs for that".

Second farmer

> *"As long as the large-scale white commercial farmers dominate the market, the smallholder producers will find it difficult to access these formal markets and participate in the high value systems. Government should come through PIB and banks and implement markets for small producers and suppress white commercial pig producers' domination on the market. This may help to achieve its goals to of the indigenization programme that aims to empower the indigenous black beneficiaries of the fast track land reform programme"*

Moreover, transaction costs were also highlighted as impacting so much to their participation to the markets. This had to do with hiring transport to the abattoirs, abattoir charges and selling the product to the final consumers. Mutambara (2013) highlighted that the abattoir and slaughter charges at 15-20 percent per kilograms noted as too high for the smallholder farmers, eroding their margins. These abattoir charges end up discouraging farmers form using the abattoir and slaughtering under informal unregistered facilities that can compromise the health and safety standards of consumers. Furthermore, shortage of abattoir facilities especially in remote areas where there are no registered slaughter facilities resulting in many resorting to slaughtering under unregistered facilities. The study by Kumar, et al (2012) also classified transaction costs, market information flow, market and road infrastructure as institutional factors that make it more difficult for smallholder livestock producers to access markets. There is need therefore for strategies that help farmers in the future to improve their participation in markets but with reasonable costs that leave farmers at least with something. These may include developing more abattoir and slaughter facilities in the district to avoid transaction and transport costs incurred by long distances travelled by smallholder farmers in trying to reach these facilities.

Poor infrastructure for smallholder farmers

Most of the interviewed farmers from the research study indicated they do not have adequate infrastructure that meets market requirements of reliable pig processors with lucrative markets. Smallholder farmers did not have the capacity to meet sanitary and photo-sanitary

standards and consequently they cannot deliver their pigs to some processors such as Colcom which has very strict requirements on safety and quality issues on products. Through interviews and personal observation it was noted that farmers struggle to provide adequate housing for their pigs which in turn will affect their productivity (see pictures below). Furthermore, poor road networks in the area impede access to the market, market information, input and services supply. In nature pigs are sensitive to heat as such they have to be transported at night or in the early morning hours, however due to poor roads in Goromonzi farmers have to transport their pigs during the day and in turn the pigs suffer from porcine stress syndrome which in the end affect the quality of the meat and the market prices.

Most of the farmers stated that they were located far away from the Harare-Marondera highway and most of the roads leading their farms were so bad that service providers fail to access their farms. They highlighted poor linkages with input and service providers in the study area. This is also supported by Alene et al (2007) who highlighted that smallholders are usually located in remote areas which are far away from the market and service providers. A study conducted by (Moser, et al 2009) noted that transport cost from local market often consume 25%-75% of the destination market price making spatial arbitrage unprofitable and leaving rural market isolated. Furthermore, long distances to the market, coupled with poor infrastructure and poor access assets and information results in high transaction costs which are too high to enable many transactions to take place for smallholder producers. A research my Musemwa et al (2008) revealed that poor state of roads in rural areas affects the ability of smallholder farmers to attract many buyers due to increased transport cost. Farmers, particularly the small-scale A2 commercial pointed out that in most cases they had to move from district to Koala abattoir which is about 50km away in search of a better market price.

One smallholder farmer had this to say;

"My farm is located so far away from the high way and I cannot access all the service providers because they cannot reach us here easily. Roads are so poor especially during the rainy season with deep potholes. The only help we have is from the govern extension worker who comes around occasionally with a motor cycle. At least the motor cycle can reach here even during the rainy season when roads are so poor. My son look at my pig house, there is no roof and this becomes worse when it starts raining. We use plastic material to cover but they are easily torn by winds. We need support from the government through funding, extension services and infrastructural development projects in the area. Our roads should be improved for us to benefit from these service providers".

High incidence of disease outbreaks

Farmers also pointed out that they were resource constrained and they could not afford the modern veterinary drugs which were required to treat different diseases and in the event disease outbreak they lose most of their stock. On the other hand for the surviving carcass the meat quality goes down and this affects the price at which the pig is sold on the market. The only solution is sell the meat to the local market but at loss compared to the costs of production. Results also showed that due to poor housing systems, limited financial resources and poor disease prevention methods they used, most of their flock was lost during disease outbreaks. In most cases they could not afford the right drugs and as a result the methods used could not help at all. Through personal observation in the study area, poor biosecurity measure in most of the farms resulted in high prevalence of disease outbreaks which affected both productivity and meat quality for the farmers.

Lack of technical know how

Research findings revealed that farmers were still lacking adequate technical knowhow on pig production which corresponds to low productivity. Lack of production technology hindered their capacity to provide pigs to big processing companies such as Colcom, Koala, Montana Meats and Caswell Meats. Moreover, due to limited or no access to financial resources and low levels of production technology (in the context of disease prevention methods they apply, breeding techniques and breeds being used) they could not afford to adopt modern technologies that require higher investment and production costs. Farmers also highlighted that the quality of information they were getting from the government

workers was not enough as these extension officers also faced problems of fuel so they would visit these farmers occasionally. This had a negative effect on the farmers especially when they were in need of veterinary assistance in times of disease outbreaks.

Furthermore, lack of new production technology especially in the small-scale semi subsistence system, inbreeding was common, affecting productivity on the farmer's side. This problem of knowledge gap as a serious challenge came about following the land reform in Zimbabwe which started in 2000. Mutambara (2013) revealed that before the land reform programme, over 40% of agricultural land was being utilized by experienced and trained commercialized farmers who were producing mainly for the market. However, the new occupants of over 90% of the farming community now comprised mainly non-experienced, semi-commercial farmers who are not so market-oriented. There is need therefore, for these smallholder pig producers to be trained adequately in technical aspects of agricultural production to ensure that a good farmer is produced. Farmer training programmes should therefore be availed at grassroots level to the newly resettled farmers . This is because lack of technical knowhow, has resulted in both production and productivity losses that occur due to poor management and handling of pigs. This in turn affects smallholder farmers' participation in the competitive formal markets which are currently being dominated by the large-scale white commercial farmers.

In addition, from the focus group discussions, farmers pointed out that they were not members of supportive associations such as Association of Pig Producers of Zimbabwe (APPZ) , Zimbabwe Farmers Union (ZFU), Livestock Meat Advisory Council (LMAC) and Abattoir Association of Zimbabwe (AAZ) in the value chain. As a result of their non-participation in such association, smallholder farmers were not benefiting from benefits that these unions offer such as collective action, facilitation in required services, production and marketing information of pigs. Farmers revealed that they did not have prior information on the existence of such stakeholder unions.

One farmer had to say this as shown below;

> "*After the Fast Track Land Reform Programme (FTLRP) in 2000, many indigenous farmers entered into commercial pig production. However, although some of these farmers were allocated land with pig infrastructure, they do not have the necessary technical know how to drive the supply of side and cost effective production base. Therefore, there is need for service providers such as government extension workers, PIB, and farmer organisations such as Zimbabwe Farmers Union (ZFU), Commercial Farmers Union of Zimbabwe (CFUZ) and the Pig Producers Association of Zimbabwe*

(PPAZ) to coordinate innovative strategies to resuscitate a vibrant industry all around by offering extensive trainings to farmers before venturing into pig production".

Pictures below illustrate poor husbandry methods which results in problems such as inbreeding and low reproductive capacity.

4.2.2 Constraints for other Chain Players

A number of face to face semi-structured interviews with different players in the smallholder pig value chain in the district were conducted. The aid of a checklist, to give direction to the interviews, was also combined with observations grids and content analysis of reports and policy documents on pig production in order to obtain in-depth information on the pig value chain. The textboxes below describe constraints some of the interviewed chain actors were facing and how their constraints impacted on the effective participation of smallholder pig farmers in both domestic and foreign markets. Below shows three boxes constraints by other key players in the chain.

Box 4.1 Interviews with Abattoirs and processors

Three abattoirs were interviewed during research study and they include (Koala, Country Harvest and Mutangadura. The abattoir manager from Koala highlighted that currently there was over supply of porkers at Koala due to the fact that at the moment Colcom, which is the main pig processing company, only offers slaughtering and processing facilities to large-scale commercial pig farmers; the burden of smallholder farmers lies with them. The main constraint they encountered was over supply of porkers over their small slaughtering and processing facility which could not capacitate all the smallholder pig farmers. In the end, farmers tend to take more than two weeks before you accepted for booking in order to get slaughtering facilities. Country harvest and Mutangadura abattoirs highlighted that due to the current liquidity crunch facing the country at the moment, they could not expand and in the end the business is low and thy could only manage to offer slaughtering facilities but without processing and marketing of the pigs and pig meat.

Abattoir managers also highlighted that they were not able to access loan facilities at the moment which in turn affect their operations and in the end they only accommodate few pig producers. The manager from Koala also pointed out that due to the high costs of stockfeeds and acute shortages of maize which is used to make stockfeeds; they face challenges of receiving low standard and poor quality pigs from smallholder farmers and this also affect their operations as they could realise profits. Moreover, managers from all the three abattoirs also highlighted that they have insufficient capital improve the slaughtering facilities that will enable them to increase the volumes of pigs to be slaughtered and processed.

An interview with Colcom officials, Zimbabwe's largest meat processor revealed that the company operates on both slaughtering and processing facilities. The manager responsible for the slaughtering also highlighted that Colcom vertically integrated its operations and it also runs a 210 ha farm called Triple C with 2,270 sows, making it the largest pig farm in Zimbabwe. The farm, and other few contracted large-scale commercial pig producers in the country supply pigs for slaughtering and processing. In addition, to meet its demands for pork and other processed pork products, the company, through its farm also introduced an outgrower scheme. These outgrower units were former disused piggeries that were situated close to the farm. Triple C under the direction of Mark Swannack, started to supply the outgrower units with pigs, transport, management training and veterinary consultancy, whilst the outgrower supplies the buildings, labour, water and electricity. The firm pointed out that the cost and availability of maize for stock feeds and genetic upgrade remain a challenge particularly from the production side. In addition in 2013 the company suffered a 5% reduction in overall volumes that were processed due to equipment failure. This was coupled with increased costs of operating and maintaining ageing plants.

Box 4.2 Interviews with Government departments

Livestock production and development (LPD) is a department in the Ministry of Agriculture which provides technical and advisory services in livestock production through training and demonstrations in different wards in the district. The small livestock specialist in the department revealed that LPD is also responsible for facilitating research, extension as well as quality control in the pig industry. However, due to resource constraints such as shortage of fuel coupled with poor road networks, they fail to deliver these services to smallholder farmers. He revealed that the government was failing to fully support the agricultural sector at the moment and that was also impacting on the smallholder pig farmers to fully participate both in the domestic and foreign markets. He indicated that sometimes extension workers and district livestock specialists could not reach farmers because of no accessibility.

Pig Industry Board (PIB) is a parastatal under the Ministry of Agriculture, Mechanisation and Irrigation Development. Its core functions are genetic improvement, research, promotion of production and marketing of pigs. The deputy director emphasised that PIB was helping farmers to comply with the law by offering service slaughter also to farmers. He said,

"*It is a requirement in Zimbabwe that pigs are slaughtered at registered abattoirs. And therefore, we provide market intelligence to farmers so that they are all well informed when they dispose their pigs".*

The deputy director however, pointed out that currently declining producer price from US$3, 10 In January 2013 to US$2, 50 in July of the same year has affected the industry so far. The demand for pork and pork products was being depressed due to low disposable incomes, pushing down producer price. Furthermore, resource constraints such as shortage of stock feed and shortage of protein supplement, shortage of maize ad soya beans in the country due to liquid crunch, was affecting pig industry in Zimbabwe.

Another constraint facing the industry was that most of the pig producers, particularly the small to medium scale farmers, were scaling down due to oversupply of cheap imports of pork and pork products from Brazil.

He also highlighted that the pig industry in Zimbabwe was being dominated by indigenous pig farmers who benefited from Fast Track Land Reform Programme (FTLRP) in 2000. However, some of the indigenous farmers entered into commercial pig production but without the requisite technical know how to drive the supply of side a cost effective production base. PIB is therefore, challenged to coordinate innovative strategies to resuscitate a vibrant industry all around.

Box 4.3. Interviews with Farmer Organisations

The organisations which work closely with pig producers included Zimbabwe Farmers union (ZFU), Commercial Farmers' Union of Zimbabwe (CFU), Association of Pig Producers of Zimbabwe (APPZ) and Zimbabwe Women Small Livestock Farmers Trust.

An interview with the executive director of Zimbabwe Women and Small Livestock Farmers Trust (ZWSLFT), revealed that although almost 60 % of farmers in the smallholder sector were women, making the sector a driver for women empowerment on poverty alleviation and food security; She pointed out that the participation of women in agribusiness industry was still limited by both historical and economic factors. Constraints such as cultural norms and expectations as well as financial and other resources, suppress effective participation of women in trading and marketing.

Interview with the chairman for Zimbabwe Association of Pig Producers (ZAPP) showed that its main objective is to facilitate sustainable pork production; processing and marketing. However, it was also highlighted that the association was fairly new and was still going under structuring. This was affecting their full support to pig producers, coupled by the current economic crisis in the country. Furthermore, membership in the association was still poor, with few smallholder farmers.

The Commercial Farmers Union of Zimbabwe is an independent and politically neutral membership organisation comprises primarily of large-scale and intensive commercial agricultural producers. The secretariat from the interview highlighted that the CFU aims is to promote a stable and competitive agricultural business environment; and to provide advice and support to farmers - covering technical extension service, inputs, marketing aspects and business management. They also indicated that after the fast track land reform programme in 2000, there was a missive decline the number of large-scale commercial pig producers. Many farms were redistributed into smaller units and since then the association was left with few large-scale commercial farms.

Interview with Zimbabwe farmers union, which an organisation that seeks to protect the interests of small-scale farmers, revealed that resource constraints such as fuel shortages have made it for them to reach all farmers but pointed out that most of the smallholders were not registered as members and since registration was through paying a certain fee, farmers either did not know of their existence or did not want to join these associations. This was affecting their operations as farmer representatives.

4.3. Which strategies has each chain player implemented to improve the participation of smallholder pig farmers into formal markets?

Results showed that most farmers in the research area had complemented their pig production with maize production as a way of reducing the costs of stockfeeds. By producing maize, farmers would buy concentrates and mix with maize to make a home grown feed. However, due the high costs of imported fertiliser and periodic droughts, maize production has been failing, resulting in the country importing maize from neighbouring countries such as South Africa and Zambia. This is supported by Sukume and Guveya (2009) who highlighted that the drastic decrease of the area under maize in the commercial sector (from 160 000 ha to 55 000 ha); and the drastic reduction in productivity (from 4.2 tons/ha to 1.5 tons/ha) also contributed significantly to high costs of stockfeeds (Sukume & Guveya, 2009).Therefore, effective participation of smallholder pig producers to markets depends on the availability of low-cost stockfeeds and this requires huge investments in improving the productivity of both maize and soybean.

From the focus group discussions it came out that some farmers in the district had either stopped pig production or scaled down their operations as result of both production costs and marketing constraints. It was highlighted that markets were so thin coupled with eminent transaction costs. A research done by Kapuya et al (2010) revealed that market risks and the scarcity and cost of inputs discourage both producers and buyers while preventing the pig production sector from expanding. Key players in the pig value chain such as government should therefore facilitate in price negotiations between processors and farmers, and setting producer prices that may prevent farmers from getting less than the cost of production. Below is an example of a one month farm production of one of the farmers interviewed.

Table 2. Summary of farm production

Inputs	Quantity	Unit costs($US)	Total Costs($US)
feed	4,2Tonnes	30/50kg	2 520
Labour	2	110/month	220
Total			**2 740**
Miscellaneous (20%) **Electricity, water,** **Antibiotics** **Transport and marketing**	US$30 US$50 US$40	120/month	120
Total costs			**2 870**
Gross output	20/pigs per month	50kg/animal	**2 800**
Selling price		**US$2,80/kg**	

Farmers, particularly the small-scale commercial indicated that to avoid risks incurred during transportation of pigs to abattoir and slaughter facilities, and losses from finding markets; they opened their own local butcheries. Others indicated that they also diversified into poultry, beef and tobacco production. One of the farmers had this to say

> *"The market does not fully support my capacity, they only allow a maximum of 40 pigs per week which puts us at risk of running a loss due to extra feed costs and sometimes you have to wait until they accept your booking because the abattoirs do not have the money to pay us or are small and still struggling to expand. Therefore, I had to build my own abattoir for both pork and beef to mitigate the problem of marketing and also to help other smallholder pig producers around. However, I am still yet to finish it but I don't have access to loans since banks want collateral security".*

A similar research by Mutambara (2013) showed that the liquidity crunch that is currently being experienced in Zimbabwe has affected the behaviours of credit facility institutions such as banks. Commercial banks that used to avail credit lines for farmers such as Agribank and Zimbank no longer offer long term credit facilities but only short term credit loans that last for one agricultural season are available for agricultural activities and these loans are only availed to those farmers who have collateral security to pay back in cases of losses. Furthermore, high interest rates of about 15-20 percent per annum that banks charge were far beyond the reach of many smallholder farmers. On the other hand, the viability of pig production requires medium to long term investments which depend upon credit lines of the same nature. However, the above situation has made it difficult for farmers and other chain players to improve especially on physical infrastructure such as pig sties, stockfeeds and working capital, acquisition of breeding stock and expanding abattoir and slaughter houses.

Interviews with key players in the chain such abattoirs showed that they have tried to reduce the number of pigs they slaughter per day considering the fact there is liquidity crisis currently being experienced in country. Scaling down has also been associated with reports of an influx of imported mechanically deboned meats (MDM) which are estimated to be as high as 1,000MT per month. These products which are being suspected of either being smuggled or time-expired, have been putting pressure on the local markets, pushing local producers, particularly new entrance to the slaughtering and processing facilities off- the formal value chains.

DBSA (2012) and Sukume, 2011) noted that due to acute shortages of stock feed brought by the combination of drought and economic crisis in 2009, the livestock industry went through a heavy de-stocking of the flock resulting in failing to meet the high demand of meat and meat

products. As a way of reacting to the escalating meat shortages, the government allowed the importation of meat and meat products into the country. However, when the local meat industry started to recover, the pressure from the low-costs imported meat and meat products persisted and until now, this has a negative impact on the growth of the industry.

Sukume (2013) also pointed out MDM is used by processors for the manufacture of sausages and is not for the retail market due to the unstable nature of the liquid product. Cheap sausages can contain as much as 80% MDM, 5% fat, 5% chicken skin, water, seasoning, colouring agents and preservatives. It is estimated that production of this cheap sausage in the country could be as high as 50MT per day. His research also showed that as much as 600MT of polony are being imported per month with a wholesale price of $2.00/kg including VAT. The pig industry feels that government should put heavy limits through the import quotas to help local producers counteract unfair competition they face from imports. The intense competition that newly resettled farmers, particularly the smallholder pig producers has led to the collapse of the quality control system where farmers prefer own-farm slaughter with no health and safety standards. In the end, they cannot reach both domestic and international formal markets.

As a way of mitigation, refurbishing and updating its existing facilities, COLCOM, Zimbabwe's largest meat processor, entered into a joint venture with Freddy Hirsch Group and venture now manufactures and supplies natural and synthetic casings, ingredients supporting the meat industry, and butchery equipment. COLCOM also vertically integrated by acquiring Triple C, one of the largest- scale commercial pig producers in Zimbabwe, with the capacity to supply about 1110 pig per week to COLCOM (Annual report, 2013). In addition, COLCOM acquired Danmeats, which had one of the best modern meat processing and cold rooms. Furthermore, in recent years, COLCOM has also been diversifying including changing its slaughter line to beef in Bulawayo, the second capital city of Zimbabwe; and the initiation of Associated of Meat Packers (AMP). However, the move by COLCOM into acquisitions, mergers and backward integration through Triple C farm; has pushed far away smallholder famers from getting slaughter and processing facilities. Only few large-scale white commercial farms which are contracted by COLCOM, can access these facilities.

Government also, having acknowledged that it cannot fully financially support the agricultural sector and as way of providing essential services to farmers runs several parastals. These include Pig Industry Board (PIB) for pig production, Agricultural and Rural Development Authority (ARDA), Cold Storage Commission (CSC) for beef; and Agribank (financial institution for farmers). In addition, the government through Agricultural Marketing Authority (AMA) creates strong synergistic relationships that fully exploit the benefits of both horizontal

and vertical linkages as a way of institutionalizing chain governance. It regulates the participation production, buying and processing of agricultural products in Zimbabwe. Furthermore, with the establishment of the AMA, the government ensures that contractual arrangements are balanced to avoid exploitation on smallholder farmers. The government promotes increased contract arrangements for smallholder farmers to participate. Strengthened and capacitated key institutions such as AGRIBANK, Agricultural Rural Development Authority (ARDA) and Grain Marketing Board of Zimbabwe (GMB). The government has also established the Infrastructural Development Bank of Zimbabwe (IDBZ) in order to strategically fulfil its mandate in infrastructural development (rehabilitate, upgrade and develop the national power grid, road and railway network, water storage, supply and sanitation, buildings as well as ICT related infrastructure). However, although the adoption of the multicurrency system in 2009 ended the hyperinflationary environment, weaknesses of the structural adjustments coupled with the liquidity crisis continue to suppress the national economic growth and stability, posing serious challenges since Zimbabwe is an agro-based country.

4.4. What are the strategies for linking smallholder pig farmers into formal markets for enhanced livelihoods?

During focus group discussions, farmers were able to provide relevant information in identifying constraints that affect their effective participation to markets and possible strategies were also highlighted.

Producer organisations/Cooperatives

Producer Organizations (PO) are defined as individuals who voluntarily come together for their own economic improvement (Bijman 2007). Smallholder pig producers need to form well-organised small groups of farmers or cooperatives as a way of penetrating formal markets. Having collective action that is based on shared common goals, skills and technologies will enable them to access both in puts and services required to improve their participation in markets. Combined efforts by working together, farmers can realise economies of such as bulk buying and are able to enter into more stable and reliable relationships with input suppliers and service providers. This is also supported by Stringfellow et al (1997) that by pooling resources to invest in transport or processing operations they can become more active participants in the marketing systems, adding value to their production. Through producer organisations smallholder pig producers can

collectively hire transport to deliver their pigs to the abattoirs for slaughter at a price lower than an individual would pay.

Farmer organisations

During focus group discussions, farmers pointed out that they were not members of supportive associations such as Association of Pig Producers of Zimbabwe (APPZ), Zimbabwe Farmers Union (ZFU), Livestock Meat Advisory Council (LMAC) and Abattoir Association of Zimbabwe (AAZ) in the value chain. As a result of their non-participation in such association, smallholder farmers were not benefiting from benefits that these unions offer such as collective action, facilitation in required services, production and marketing information of pigs. Farmers revealed that they did not have prior information on the existence of such stakeholder unions. There is need therefore, to link smallholder pig producers to these associations so that they may be able to benefit and linked to other service providers and key chain players for market access and full participation. However, associations such as Zimbabwe Association of Pig Producers (ZAPP) were still fairly new and were still going under structuring. This was affecting their full support to pig producers, coupled by the current economic crisis in the country. Furthermore, membership in the association was still poor, with few smallholder farmers.

Market Relations

Results obtained from the research study showed that the smallholder pig value chains, particularly chain 2 and 3 (Figure 8), had weak chain relations such as information flow from one player to another and interaction among the chain actors. For instances, chain 3 showed that some farmers just had retailer-customer relationship with feed manufacturers and consumers. They did not have any other interactions with other chain players since they had own-farm slaughter and sell directly to the local market. This affected their linkages to formal markets because of such poor relations. This is line with KIIT and IIRR (2008) who highlighted that strong chain relations are characterised by strong organizations, trust, open and frequent communication and cooperation for mutual growth. Therefore, there is need for smallholder pig producers to create strong relations with other actors and stakeholders in the value chains so that they r to enhance frequent communication and co-operation in tackling issues of common interest within the chain such as quality, health and safety issues in pig production and marketing.

Abattoir Facilities

During focus group discussion it was pointed out that the district had few abattoirs and farmers had to travel about 50 km distance to look abattoir and slaughter facilities. However, due to high costs of transport, coupled with poor road networks from the farms to the main market, farmers found it difficult to continue and in the end, they would prefer own-farm slaughter which was characterised by poor health and quality standards. Mutambara (2013) also supports this in his research and pointed out that abattoir and slaughter fees are so high in Zimbabwe that farmers especially those in remote areas are discouraged from using the abattoirs and end up slaughtering under informal, unregistered facilities.

Credit facilities

Majority of farmers highlighted that currently, they did not access to credit facilities form financial institutions such as Agribank and CBZ. This has been attributed to problems of liquidity crisis in the country. Financial institutions are also failing to avail credits to farmers. Moreover, those that avail loan facilities charge exorbitant interest rates of about 15-20 percent; they also require collateral security which is beyond the reach of most smallholder pig farmers. Therefore, there is need for financial institutions to provide loans to farmers so that they are able buy inputs such as stockfeeds and working capital. During focus discussions, it was also pointed out that government should develop policies that control interest rates charged by banks.

Training facilities

A lack of technical knowhow was highlighted a serious challenge affect smallholder participation into the formal markets. This was due to the fact that the pig industry is now dominated by smallholders who comprised mainly by non-experienced, semi-commercial farmers who are not so market-oriented. The new farmers need to be trained adequately in technical aspects of agricultural production to ensure that a good farmer is produced. There is a need to avail farmer training facilities so that production and marketing costs that are being incurred to poor management and lack of experience in the sector. Government through extension services could facilitate new farmer trainings because farmers complained that PIB offered training facilities at a fee which was beyond most of them.

Contract farming arrangements

Contract farming can be defined as an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices (Eaton and Shepherd, 2001; Bijman, 2008).

As the agricultural sector began to modernize and commercialise, in Zimbabwe, after the land reform programme in 2000, which saw a new agrarian structure (Scoones, 2010: FAO, 2012), well organised and coordinated value chains for market-oriented agricultural products such as contract farming became increasingly important as part of this process. A number of commercially-driven contract schemes for both crops and livestock in Zimbabwe increased with all the contracts covering the provision of inputs on credit and repayment when the commodity is delivered to contractor. Generally, those involved in the case of crops such as cotton, tobacco, tea and horticultural commodities, are largely restricted to high value export out-grower schemes (FAO 2003).

Livestock contract farming schemes (LCFSs) on the other hand however, focused specifically on poultry, although attempts have been made in ostrich, dairy and pig out growing. There is need for companies such as COLCOM, PIB and other slaughter and processing companies to introduce contract farming to the smallholder pig producers so that they can participate fully in the formal markets. This is so because smallholder farmers cannot access these markets. High value chains require vertical coordination and under contract arrangements, these are achieved. This is supported exponents of contract farming that it links small-holder farmers into lucrative markets and solves a number of problems small-scale farmers face in diversifying into high-value commodities (Minot, 2007; Key and Runsten, 1999: Barret et al, 2012: Minot, 2011). However,

5. Conclusion and Recommendations

In conclusion, there were three pig value chains in Goromonzi district. Constraints for smallholder pig producers included acute shortages of stockfeeds, market challenges, and poor infrastructures, high incidences of disease outbreaks and lack of technical knowhow. These constraints were barriers to effective participation of smallholder pig farmers in the formal markets. As a result farmers would end up selling through informal channels that did not fetch huge margins. Other key players in the value chain also had constraints such as failure to access loans for working capital due to liquidity crisis being experienced in the country; and also some service providers such as extension workers faced problems of fuel to reach farmers. Moreover, poor road networks in the district was highlighted as a major constraint that discourage both input providers and service to reach farmers while farmers could not reach formal markets as a result of that. Although most producers had either diversified into poultry, beef and tobacco production as way of mitigating poor markets for pigs, scarcity and high cost of stockfeeds still affected their productivity. For those farmers who developed their own butcheries still faced problems of working capital for infrastructural development. Strategies that were highlighted included the formation of producer organisations or cooperatives which can help famers to access formal markets. Other strategies were developing more abattoirs in the district to avoid high transport costs; more training programmes for new players who benefited from the land reform programme, banks should avail credit lines and reduce interest rates for smallholder farmers to have access to working capital for infrastructural development. Furthermore, farmer organisations such as Zimbabwe Association of Pig Producers (ZAPP) to help farmers to join as members so that they can benefit from benefits that these unions offer such as collective action, facilitation in required services, production and marketing information of pigs. Market relations between farmers and other key players in the chain should be facilitated to avoid weak relations such as information flow from one player to another. Finally, contract farming was highlighted as a strategy with the potential to incorporate smallholder pig producers into the lucrative high value markets.

1. Previous researches have focused more on constraints to pig production in Zimbabwe in general including the large-scale white commercial producers who dominate the current formal markets. This research focused more on the newly resettled A1 small-scale semi subsistence and A2 small-scale commercial farmers into the sector and how to promote their effective participation into the formal markets. Current results show that market is dominated by few large-scale white commercial pig producers. Therefore, future research should focus on understanding

the whole pig value chains in Zimbabwe and how to integrate the new players at each stage of the chain.

2. There is need also to promote vertical coordination through dialogues between actors and traders at different chain level for mutual understanding to determine prices for pork and pork products and linking member farmers for services and markets.
3. There is need for future researches to focus on how the structural adjustment and the fast track land reform programme affected the pig value chain in Zimbabwe. This is because after the land reform, informal marketing systems increased in most smallholder marketing channels. In most cases these systems only work under the conditions unfavourable to the farmer as they are characterised by weak and unreliable information systems on market conditions; limited coordination value chain players and spot market transactions with inadequate mechanisms for risk management.

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Appendices

Appendix 1: HOUSEHOLD QUESTIONNARE:

QUESTIONNAIRE ON STRATEGIES THAT LINK SMALLHOLDER PIG FARMERS TO INTO MARKETS FOR ENHANCED LIVELIHOODS IN GOROMONZI DISTRICT, ZIMBABWE

SECTION A: IDENTIFYING INFORMATION

Questionnaire ID_____ **Date of interview**_____

	Question	**Response**
1	District	
2	Ward	
3	Name of household head	
4	Name of respondent	
5	Age of respondent	
6	Gender of respondent	

SECTION B: BACKGROUND INFORMATION

	Question	**Response**	
7	Educational level of the respondent		*0= no formal education* *1= primary 2=secondary* *3= tertiary 4 vocational*
8	Highest level of education in household		*0= no formal education* *1= primary 2=secondary* *3= tertiary 4 vocational*
9	Household size: Young children below 10years Older children between 10-18years Adult females		
10	Pig farming experience (number of years)		
11	Farm size (ha)		
12	Arable land (ha)		
13	Total capacity of rented pig houses (if any)		
14	How much do you pay for the rented houses		
15	Is it shared on monetary basis or as production share		

SECTION C: RESOURCE CHARACTRISATION

16 (a). Household ownership of agricultural enterprise equipment

	Equipment	**Response**
16.1	Title deeds to the land	
16.2	Ox-drawn plough	
16.3	Generator	
16.4	Water, water pump	
16.5	Tractors	
16.6	Livestock facilities	

16 (b). Household ownership of non-agricultural equipment

	Equipment	**No. owned**
16.1	Car/truck	
16.2	Motor cycle	
16.3	Radio	
16.4	Television	
16.5	Tractors	

17. What is the size of your flock? .....

18. How many batches do you produce in a year?

(1) Once

(2) Twice

(3) Thrice

(4) Four Times

19. Where did you buy your sows and boars?

(1) PIB

(2) Local breeders

(3) Others (specify)

20. Give a score to the following purposes of pigs in order of importance: 0 is unimportant 10 is extremely important, for each function score from 0 to 10 is possible

Row	**Uses**	**Score**
21.1	Meat production	
21.2	Symbol of wealth	
21.3	Insurance	
21.4	Banking function	
21.5	Spiritual/ritual purposes	
21.6	Source of income	

22. What costs do you incur per batch?

Inputs	Quantity	Unit costs($US)	Total Costs($US)
feed			
Number of pigs			
Labour			
Total			
Miscellaneous (20%) electricity, water, antibiotics, transport, marketing			
Total costs			
Gross output			
Selling price			

23. Are you satisfied with the price being offered by the processors?

(1) Yes ☐

(2) No ☐

24. Please explain

……
……..

25. Do you have a ready market for your pigs after they reach expected slaughter weight? Please explain……
……

26. Where do you normally sell your pigs when they reach expected slaughter weight?

……
……
……

27. Do you have access to market information before selling off your products?

……

28. What is your relationship with other stakeholders in the value chain?

……
……
……

29. What are some of the constraints you face as farmers in pig production?

……
……
……

30. What solutions have you employed to try and minimize these constraints?

……
……
……

31. What strategies should be in place to sustainably maximize pig production and improve marketing on your farm?

……
……
……

32. Any other comments?

……
……
……
……

THANK YOU FOR YOUR COOPERATION!

Appendix 2: Key Informant interviews

Interview Questions for Key informants -Processors and abattoirs

1. What relationship with the small to medium scale farmers?
2. Do you also offer processing/slaughtering facilities to farmers who are not your contract growers?
3. If yes what are the requirements necessary for farmers to have access to your processing facilities?
4. What are the volumes you require for processing/slaughtering per day?
5. What are the qualities of the pigs you require for processing/slaughtering?
6. What other services do you offer to small and medium scale farmers?
7. What strategies can be done to help farmers access processing facilities?

Interview Questions for Pig Industry Board Zimbabwe

1. Who are the members of the board?
2. What services do you offer to farmers?

3 What can be done to allow small and medium scale farmers to participate in the formal chain?

4. What problems do you face as an industry?
5. How do you think these problems can be resolved?

Questions for Farmer Organisations

1. Is the position of small holder farmers important in Zimbabwe's Agricultural sector?

Yes	1	☐
No	2	☐

Please explain……

2. What are the challenges for smallholder farmers to participate in the formal high value-added chains
3. From the question above, rank the challenges/constraints for smallholder farmers to participate in the poultry out grower schemes .eg. (1= maximum affecting factor, 5= least affecting factor).
4. What is your opinion regarding the way forward in solving the challenges mentioned above?

Questions for government departments

1. What is the role of the government in facilitating chain governance?
2. What are some of the policies and programs on pig farming being undertaken by the department?
3. Do pig production companies/farmers and processors have legal protection and strong government policies against the cheap pork and pork product imports? If the answer to this question is yes please lists the policies.
4. What strategies can be undertaken to improve marketing for farmers?
5. Can smallholder pig farming be used to alleviate poverty in the poor resource areas of Zimbabwe? If yes please explain

……

6. Any other comments regarding smallholder pig farming in Zimbabwe?……