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Pork Value Chain Scoping

Study Report

Value Chain Alliance for Livestock Upgrading & Empowerment (VALUE) Project

CIPS FOUNDATION

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About The VALUE Project

The Value Chain Alliance for Livestock Upgrading Empowerment (VALUE) is a European Union funded project working in the goat and pork value chains under the Zimbabwe Agricultural Growth Programme. The project is running for four years between February 2019 and January 2023 and is being implemented in six provinces namely Manicaland, Matebeleland South, Matebeleland North, Mashonaland Central, Mashonaland East and Mashonaland West.

ActionAid Zimbabwe is the lead organisation in partnership with COSV and Mercy Corps together with private sector livestock players namely Shamiso and Braford farms in the pork value chain, Michview and Zvikomborero farms in the goat value chain. The aim of the project is to improve the capacity of smallholder farmers especially women and youths to improve their goat and pig breeds, production and productivity, access to viable markets and organizational efficiencies.

Acknowledgements

The VALUE project expresses heartfelt gratitude to the Development Governance Institute and field enumerators who dedicated time and effort to conduct this scoping study.

We are grateful for the technical support received from district and ward frontline extension staff who played critical roles in farmer mobilisation and data collection. We value the contributions received from the sampled farmers, district authorities and other value chain players which contributed to the successful completion of the study.

The invaluable contributions received from farmers, district authorities and other value chain players all contributed to the successful completion of the study.

Last but not least, the project greatly appreciates financial support from the European Union and the CIPS Foundation without which it would have been impossible to undertake the study.

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List of Abbreviations

AGRITEX	Agriculture Extension Services
AI	Artificial Insemination
DCED	Donor Committee for Enterprise Development
DVS	Department of Veterinary Services
FAO	Food and Agriculture Organisation
FGDs	Focus Group Discussions
GIZ	Germany Society for International Cooperation
GSVF	Gender Sensitive Value Chain Framework
HIV	Human Immuno-Virus
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
KIIs	Key Informant Interviews
LMAC	Livestock and Meat Advisory Council
LPD	Livestock Production and Development
NGOs	Non-Governmental Organisations
ODK	Open Data Kit
PIB	Pig Industry Board
PPAZ	Pig Producers Association of Zimbabwe
PVC	Pork Value Chain
VALUE	Value Chain Alliance for Livestock Upgrading and Empowerment
VC	Value Chain
ZIMVAC	Zimbabwe Vulnerability Assessment Committee
ZRP	Zimbabwe Republic Police

Executive Summary

The Value Chain Alliance for Livestock Upgrading and Empowerment (VALUE) project seeks to positively impact on economic opportunities for fifty-six thousand (56 000) small to medium pig producers. Targeted smallholders are currently stuck at different suboptimal stages of commercialization and economic growth. The project will address value chain constraints related to financial, environmental, technological, organizational and poor market linkages. It will also address regulatory and policy constraints. For a textured understanding of the value chains constraints, dynamics and to benchmark the project indicators, the project undertook a pork value chain (PVC) scoping study.

The main objectives of the participatory and corridor-specific value chain scoping study were;

a) Assess the economic, environmental, financial, social and natural aspects of the pork value chain along the Mashonaland East and West production corridors feeding into the Harare market;

b) Baselining project monitoring and evaluation framework;

c) Determine the key vulnerabilities in the PVC for purposes of building resilient Market Systems for all the value chain actors;

d) Analyse the key gender issues around the PVC (ownership, control, decision making systems, gender and market dynamics, gendered access to financing etc.)

e) Mapping of the VC actors and analysing the power dynamics between the different stakeholders in the value chain

f) Assess the strength and weaknesses of value chain stakeholders including PPAZ, LMAC, Farmer Unions, Government line ministries and departments

g) Assess all stakeholder's/ target groups, capacities, their strengths and weaknesses; and those of other stakeholders such as Government Ministries, mapping of VC actors, policy gaps, market assessments on competitiveness of PVC;

h) Identifying the policy gaps in the PVC with a view develop an influencing and lobbying strategy for the project.

i) Benchmarking the Fair Value Farming Brand parameters and establish the operational framework for use by the project.

Methodology.

A Value Chain Development Framework was used for the scoping study. Mixed methods incorporating both quantitative and qualitative aspects were applied for data gathering and analysis. Quantitative data was collected using a survey questionnaire administered to 298 pig farmers with responses analysed using the Statistical Package for Social Scientists (SPSS). Qualitative data were used to contextualize the findings for a deeper understanding of the quantitative data in a sub-sample of communities. Focus Group Discussion sessions and Key Informant Interviews were used for qualitative data collection. The study covered Chegutu and Mhondoro-Ngezi In Mashonaland West province, Goromonzi and Murehwa districts in Mashonaland Est province. In each district, wards were selected guided by pig population.

Study Findings.

a) Overview of the Pig Sub-Sector

Pork is the most consumed animal protein around the globe. China, the European Union, the United States, Brazil and Russia lead the way, supplying 86% of the total production worldwide. In Africa, Nigeria and South Africa are the key pork producing countries, with an output of about 276 thousand tonnes and 246 thousand tonnes in 2017, respectively. Others are Malawi (11.5%), Uganda (8.8%), Mozambique (8.5%) and Angola (8.0%). Pork production in Zimbabwe is practised by small, medium and large-scale commercial farmers in all the provinces of Zimbabwe. In terms of breeds, the Large White, Duroc, Dalland, Landrace and the indigenous Mukota are common in local production systems. The Mashonaland provinces dominate in terms of producer areas accounting for 79% of the national sow herd.

Key players in pork production include the Livestock and Meat Advisory Council (LMAC), Pig Producers Association of Zimbabwe, Stock Feed Manufacturers Association of Zimbabwe, Zimbabwe Association of Abattoirs, Zimbabwe Herd Book and the Meat Processors Association of Zimbabwe. Service providers include the government departments responsible for livestock production, veterinary services, economics and markets, the Animal Health Industry Committee and farmers' organizations (Commercial Farmers' Union, Zimbabwe Commercial Farmer's Union and Zimbabwe Farmers' Union).

b) Sub-Sector Map.

The study found that the key pork sub-sector functions are input supply, production, slaughter, meat processing, wholesaling, retailing and consumption. Different actors across the sub-sector and the services providers were mapped, including the respective overlays.

c) Input Supply Function Findings.

The input supply function in the pork sub-sector includes veterinary supplies, feed supplies, the provision of breeding services, extension services, transport services and equipment. The veterinary drugs and vaccines are supplied by private sector players, with the Department of Veterinary Services (DVS) once a key player in providing drugs and the vaccines now incapacitated. Most of the drugs are imported and therefore they are beyond the reach of most small-scale producers. The major challenge with veterinary supplies is the packaging and quantities available. For instance, the drugs mostly available are the fifty (50) dose packages. This is not appropriate for most of the small-scale farmers whose herd size is less than fifty (50). In terms of coverage and penetration by providers of veterinary supplies the study noted that most districts are well covered, except for Mhondoro-Ngezi. The district does not have local suppliers of veterinary drugs and vaccines.

Feeds constitute around 80% of the production costs. Farmers are using both purchased and farm produced feeds. The supply of feed is constrained by the current shortage of maize and soya meal on the market which is further compounded by Statutory Instrument 145 of 2019 which banned the sale of grain. Recurrent climate induced droughts are also contributing to the shortage of grain. In the provision of feeds, the private sector players are taking a leading role.

Zimbabwe does not have pig breeders. Currently the Pig Industry Board (PIB), Art-Farm, Triple C (serving selected farmers), Braford Farming, Shamiso Farm, Munda Farm and Mangisi Farm are the reliable sources of breeding stock in the two corridors. As a coping strategy much of the small-scale farmers are using their Boars as breeding stock. The pig industry is also importing breeding stock, mainly from South Africa.

The equipment that is required includes ear-notchers, side cutters, stainless scissors and weighing scales among others. These are supplied by private sector players. The challenge with the supply of equipment, is the shortage and high cost of supplies as they are imported.

d) Production Function Findings.

The majority (80%) of the pig farmers in Zimbabwe are the small-scale farmers who are mostly men. However, pig production is being run as a family business. The core reason for venturing in pig production is the need to have money on a regular basis. The study found that the majority of the pig farmers are in their youth between 18 and 35 years of age.

In terms of herd composition, the study found that the most kept breed is the Large White. It is the dominant breed because of its high productivity. The least kept breed is the Mukota because it is not ideal for commercial purposes. The study found three pig production systems among the sampled farmers. These are i) farrow-to-finish, ii) feeder pig and input (contract) and iii) pig farming production system. The study established that the majority (95%) of the farmers are involved in Farrow-to-Finish production systems, whilst 1.5% of sampled farmers were engaged in Feeder pig production. With regard to the production methods, the study noted that farmers are using all the three methods of intensive, semi-intensive and free ranging (scavenging). However, 88.4% are practicing intensive production with 11.1% engaging in semi-intensive production and 1% are doing free-ranging production.

An assessment of the housing structures revealed a plethora of materials in use. 75.4% of the pigsties are of bricks under iron roofing sheets, which complies with the standards prescribed by PIB.

On breeding strategies, sampled farmers were not following distinct practices. However, they selected boars with good physique and good genetic material for breeding based on considering the number of teats. The use of AI is still very limited at 1%. This is because of the non-availability of the semen on the market and the associated high costs of bringing it to production sites. The study results indicate that the average boar-to sow ratio is 1 to 9.2. This figure is below the industry standard of 1:15. The average is being pulled down by the small-scale farmers whose ratios are between 1:7.4 and 1:7.5 for both males and females respectively. Champion women farmers exceed the industry benchmark of boar to sow ratio, they are at 1:16.25.

Industry piglet birth weight standard is 1.5 kgs. The sample average is 1.63kgs. Average weaning weight amongst sampled farmers was 8.3kgs. This indicates that medium and large-scale farmers generally apply good management practices. Average industry weaning age is 35 days. Sampled farmers average was close at 34.8 days. This average is with the acceptable standard deviation from the mean of 35 days. Regarding average litter size of at least 12, sampled farmers averaged 12.2. The accepted farrowings per year in the pig industry is 2.2. The study data shows that the average number of farrowing per year is 2.1, which is within the acceptable standard deviation from the mean of 2.2 acceptable in pig production.

Sampled farmers' average piglet mortality of 55.2%. was way off the industry benchmark of less than 10%. Sampled farmers were experiencing higher mortality due to poor management practices for their sows and piglets during the early days of dropping the litter. The scoping study found that the DWFC rate among the sampled farmers is 7.42kgs against an industry average range of 3.6 to 4.2. The sample average is higher than the standard set by the industry. This is because the animal's growth rate is low which is attributed to bad management practices and the poor genetics of the pigs reared by smallholder farmers.

Regarding the feeding practices, the pork value chain scoping study found that farmers have several feeding systems. These practices range from providing commercial feed to free-ranging. For 62.5% of sampled farmers feeding practices combine commercial and non-commercial feeds. The logic behind this practice is to try and minimize the costs of feed.

The most common diseases identified by the study are scours (65.7%) followed by suffocation (14.9%), pneumonia (7.6%) and worms (8.9%). The treatment and vaccinations of the pigs is largely done by the farmers. This is because public sector service providers lack adequate capacity to attend to farmers' needs.

e) Animal Slaughter and Meat Processing Function.

The study found 124 registered slaughtering facilities in Zimbabwe. However, the abattoirs are not strategically located to enable smooth flow of products in the pig industry. For instance, in Mashonaland East province, the majority of the registered slaughter facilities (Koala, Tilisa and Ziyadhuma) are concentrated on one side of Goromonzi district. This presents logistical challenges to the farmers across the district who require slaughter services. The consequence of inaccessible slaughter facilities is that the transport costs become higher reducing profit margins for the farmers. As a result, many farmers resort to slaughtering their pigs at farms taking meat straight to the retailer or consumer without inspection.

The study found that there is a sizeable number of pig abattoirs across the different grades. In grade C, there is PIB with a processing capacity of 15 pigs a day. PIB abattoir gets pigs from its production unit and from farmers who will be requiring slaughter and blast freezing services. The abattoir at PIB is failing to meet the demand for slaughtering and blasting services from the farmers. The Board is in the process of upgrading its abattoir to grade B. The buildings for upgrading have been erected. What is left is the equipment (e.g. for cold room).

Grade B abattoirs are those with capacity to slaughter between 16 and 300 pigs a day. These include Tilisa, Ziyadhuma, Reinham and Koala. Tilisa has a slaughter capacity of 50 pigs/day and is operating at 90% percent. This high capacity utilization is because it is getting pigs from Koala, and Surrey abattoirs which are concentrating on beef. Ziyadhuma is a state-of-the-art abattoir. It has an installed capacity of 80 pigs a day but is operating at 20%. Koala's capacity is 140 pigs a day but is operating at 50%. Reinham is operating at 50% of its installed capacity of 150 pigs a day. The low capacity utilization at Reinham is because of its location (Harare) in relation to pig farmers who are mainly in Zvimba district. The grade B abattoirs are largely offering slaughter, blasting, wholesaling and retailing services with very limited processing and value addition.

Grade A abattoirs are those with capacities to slaughter more than 300 pigs a day and are also export oriented. In this category there is Colcom with an installed slaughter capacity of a 1000 pigs a day. However, it is only operating at 23% capacity. To enhance its utilization of the installed capacity, Colcom has set-up its pig producing farms and outgrower units like Triple C in Norton and others in Goromonzi, Shamva and Mazowe districts. The grade A abattoirs are also involved in wholesaling and retailing. They also sell raw and processed pork to wholesalers and retailers.

All the pig abattoirs are operating below installed capacity due to limited supply of pigs. In addition to the above registered abattoirs, there are numerous, unregistered and small slaughter facilities providing pig meat at irregular times for the fresh meat market, especially the urban low and middle-income earners.

f) Wholesaling and Retailing.

The wholesaling of pork meat and products is done by abattoirs and few independent butcheries. Pork wholesaling is dominated by meat companies such as Colcom, which is the industry leader. Other actors are the large chain supermarkets (OK, Pick n' Pay, Choppies, Spar etc.), small retail and tuck shops in high density suburbs.

g) End-Markets (Consumption).

The pork value chain has two end markets of urban high-income market and urban low- and middle-income market. The latter is the most active end-market channel. It is supplied by independent butcheries, large chain

supermarkets, farmers and vendors. It is largely supplied with raw pork (including pork heads, trotters and pork skins). Pork meat products supplied to this market generate low margins to farmers. The market however has great potential for processed and high value pork products, which becomes possible with product packaging appropriate for the disposable incomes of consumers in this market. The urban high-income market provides the highest margins for value chain actors. It requires processed pork products such as polony and bacon. Both end markets suit VALUE project chain actors. Tailored capacity is needed particularly for smallholders to tap into these formally and gain fair value.

h) Regulatory Environment.

There are regulations that affect the pork industry. These relate to i) production at enterprise (farm) level, ii) the livestock inputs, iii) environmental management, and iv) whole pork value chain governance. At farm level the Animal Health (movement of cattle & pigs) Regulations of 1984 is a key disease control measure, which the Department of Veterinary Services enforces. Animals are moved subject to a permit authorizing and specifying movements from their usual places of stay to either an abattoir or another farm. This is done as a way of certifying that the source of animals is free from all notifiable diseases and thus are not a health risk wherever they will be taken to. The farmers are also expected to comply with the Environmental Management Agency (EMA) Act (Effluent Discharge Management –inspection fees and fines).

At the input function level, the pig industry is regulated by the Customs & Excise (Tariff) Notice Amendment Number 20, the Fertilizers, Farm Feeds & Remedies Act (Chapter 18:12), the Medicines and Allied Substances Control Act (Chapter 15:03) and SI 145. The first instrument regulates imposition of import and value added taxes levied on pig industry raw materials, which makes the veterinary supplies and feeds expensive for the farmers. The restrictive and cumbersome protocols of the Medicines Control Authority of Zimbabwe (MCAZ) are unfortunately a supply barrier seen through the shortage of veterinary drugs and vaccines. Other regulations raise the cost of compliance for smallholders making them uncompetitive and thus reduce the viability of pork production for farmers.

i) Value Chain Financing.

The study results indicate that all the actors across the chain are self-financing. With respect to pig producers, the study results indicate that 92.6% of the production is self-financed, 3.4% is financed through bank loans and 4% is funded through remittances. Whilst the value chain actors require financial products and services, current financial products are not tailor-made to the pig production cycle. With changes in the socio-economic character of producers most do not have collateral (especially small-scale farmers) required by banks to secure loans.

Although the financial institutions perceive agricultural investment as high-risk business because of price, climate and credit risks they showed willingness to do business with the pork value chain actors. There is therefore a need for new and innovative agricultural financing solutions that are commercially viable for both the financier and the smallholder farmer.

j) Value Chain Governance.

The governance of the pork value chain in Zimbabwe is captive. A captive value chain is where small suppliers (farmers) are dependent on a few buyers that often wield a great deal of power and control over them. In the context of Zimbabwe's pork value chain, there are several small-scale producers who depend on industry leaders such as Colcom and other Grade B abattoirs. Big buyers determine or set the prices and standards that reinforce their monopoly. This captive pork value chain governance is characterised by arm's length "spot market transactions" between producers and the buyers with no contractual or hierarchical arrangements.

The captive governance structure is characterized by information asymmetry. Furthermore, the capacity of smallholder producers to efficiently and reliably produce the product is curtailed by an inappropriate business

environment. Weak organizational capacities of the smallholder farmers buttress the captive governance structure. The medium and large-scale pig farmers are organized and most of them belong to the Pig Producers Association of Zimbabwe (PPAZ). The study found that 92% of the sampled farmers do not belong to any farmer grouping or organizations.

k) Fair Value Farming Branding.

In assessing the fair value farming branding, the study focused on five interwoven issues namely salaries for workers in the chain, return on investment (profits) to the entrepreneurs, tax revenues to government, better food supply to the consumers and net impact on the environment (externalities). The net impact on the environment can be positive or negative. The study found that 47% of the employees in the pork industry at the product function level, earns below ZWL195.00 (USD13/month) stipulated by the NEC for the General Agriculture Agreement of 1st July 2019. With respect to returns on investment, the study data indicate that butcheries and brokers are getting the highest returns of USD1.66, farmers get USD0.66 abattoirs USD0.50 in returns per investment. The farmers are in-between at return.

Regarding the environmental aspects of the fair value farming branding, the study found that it was negative. This is because many of the farmers were found out not to be properly disposing the pig waste. EMA is also not properly monitoring the disposal of the waste.

l) Support Service Functions.

The main service providers in terms of the input supply and production functions are PIB, DVS, AGRITEX, PPAZ, Department of Small to Medium Enterprises (SMEs) of the Ministry of Women's Affairs, Community, Small and Medium Enterprise Development and the Environmental Management Agency (EMA). The PIB is involved in pig farmer training, research on pig feeds and diseases, advising farmers on marketing of pork and pork products, supplying breeding stock and semen to farmers. The PIB is constrained by staff challenges.

The farmer-to-extension staff ratio is 1:306. This ratio indicates that the current staff is far fewer than is needed for the current number of the pig farmers. Training equipment and vehicle shortages negatively affect delivery of extension services. Limited fiscal support constrains the implementation of innovative programmes such as the weaner program and facility.

AGRITEX provides technical and advisory services to enhance production and productivity. The agency's core functions include livestock extension or advisory services through farmer training and offering of some regulatory services. AGRITEX is incapacitated in terms of the number of extension personnel, mobility and the latest pig industry knowledge. The Department of Veterinary Services (DVS) promotes biosecurity, animal health and welfare for the benefit of the livestock industry and human well-being. Its core functions include disease surveillance, investigation and control, development of veterinary infrastructure and provision of animal health information as part of administering the Animal Health Act. The department's ability to deliver on its mandate is constrained by lack of vehicles and motorcycles.

There are private sector input and production service providers in the pork value chain. However, they are failing to meet the farmer demand because of the regulatory environment which is not conducive. Another service provider is the PPAZ. Information on pig production, profitability and sustainability is shared between members so that the industry remains vibrant and viable. PPAZ has been organizing learning events for its members and the general public annually. The main challenge for PPAZ is limited membership.

The providers of support services related to animal slaughter and meat processing functions are local authorities, Ministry of Health and Child Care, the Zimbabwe Republic Police (ZRP), AGRITEX, Livestock and Meat Advisory Council and EMA. The ZRP's role ensures that the pigs that are being moved have not been stolen. The DVS issues movement permits. The process of getting permits from state agencies is cumbersome. In most

cases farmers are forced to pay extra money to transport officers as well as pay for their meals while on duty. The "incentives" speed up issuance of the movement permit. The Ministry of Health and Child Care is responsible for the inspection of the slaughter and abattoir facilities to ensure that they meet the minimum health standards. The Ministry lacks capacity in terms of mobility to inspect all facilities. AGRITEX on the other hand provides meat inspection services at these facilities. A Meat Grade and Inspector is stationed at each facility. The study was informed of corruption resulting in passing unworthy meat as being fit for human consumption. EMA is supposed to monitor and regulate the disposal of affluent and waste at the abattoirs, but because of resource constraints, this function is usually performed at bigger slaughter facilities.

At the wholesaling and retail function, the service providers are the Consumer Council of Zimbabwe, LMAC, ZRP and the Local Authorities. The key function of the service providers is to ensure that the public gets safe meat fit for human consumption. The service providers are involved in the inspection of the quality of the meat that get to the consumers.

The regulatory environment support services providers are concerned with the creation of an enabling business environment for the pork industry. Regulatory and policy service providers include PPAZ, Agricultural Marketing Authority (AMA), LMAC, Ministry of Lands, Agriculture, Water and Rural Resettlement and AGRITEX. The department of AGRTEX besides training also provides regulatory advisory services to the pig farmers. The PPAZ leads in lobbying, advocacy and policy influencing for the creation of a viable pig industry that is globally competitive. AMA is a parastatal under the Ministry of Lands, Agriculture, Water and Rural Resettlement. It regulates the production, buying and processing of agricultural products and facilitation of market linkages for the small-scale farmers in the country. The Ministry of Lands, Agriculture, Water and Rural Resettlement is responsible for the development of a National Livestock Policy. The policy's intention is to facilitate efficient and effective utilisation of animals that farmers rear. The Ministry is also tasked with policy enforcement, disease surveillance and control.

Study Conclusion and Recommendations

The study concludes that the pork value chain in Zimbabwe is facing considerable challenges. The subsector, however, has potential for commercialization given the unmet market demand. Even in a context of falling disposable incomes for most people in Zimbabwe, meat consumption shows potential for growth with positive implications for pork value chain actors. The demand for pork meat and processed products is still high in the urban low and medium income and urban high-income markets. To fully exploit the commercialization potential in the pig industry this scoping study make the following recommendations;

Enhanced Farmer Organization for Vertical Value Chain Integration.

The study recommends the setting up of Farmer Business Organizations (FBOs) along each of the production corridors providing both backward and forward integration. The backward integration will facilitate efficient agro-service and extension service delivery, technology adaptation and mechanisation of the pork industry, input and output market competitiveness. Forward integration allows producers to be involved in slaughtering, processing and eventually wholesaling and retailing. The Value Chain Integrators will play leading role in assisting the FBOs in setting up the input supply aggregation centres.

Setting-up an Abattoir for the Mashonaland West Corridor.

The study further recommends the establishment of one slaughter and abattoir facility in the Mashonaland West corridor to cater for pig producers in Chegutu, Mhondoro-Ngezi, Makonde and Zvimba districts. The study observed that the farmers in these districts have challenges in accessing slaughter and abattoir facilities. The facility could be established at Selous (Half-way), which is centrally located.

Upgrading of Abattoir Facilities at Pig Industry Board.

The Mashonaland East Corridor has three pig abattoirs. The study recommends upgrading of existing facilities to enable the absorption of increased throughout from farmers. The upgraded facilities will be operated under a Producer-Private-Public Partnership with the leadership of the farmer organisations – the FBOs. The study recommends the upgrading of the PIB abattoir, because already the institution has started the process to upgrade to a Grade B abattoir. Outstanding work includes equipping the abattoir with cold rooms, blast freezers and green energy. PIB is being recommended because it offers opportunities for the farmers to learn the whole pig production cycle from the farm to the product. However, the success of this proposal hinges on the negotiation capacity of the FBOs and the PIB's willingness to be in such a venture.

Setting-up Market Systems Development Platform (MSDP).

Because of the observed captive governance structure in the pork value chain, the study recommends the setting up of Market Systems Development Platform. The MSDP will be composed of the key value chain actors in both the primary and secondary chains. Numbers of key players will determine the size of the MSDP. However, the key actors will be farmers, lead firms, processors and buyers (wholesalers and retailers). Platform leadership will be assigned to lead firms in each value chain corridor. In first year of set-up, the MSDP will meet bi-monthly and gradually reduce meeting frequency as functionality increases. The MSDP will be involved in setting the vision of the value chain, determining efficiency, cross-chain fairness, regulatory quality and other competitiveness standards as well as oversee relevant capacity development along the value chain. The different roles and responsibilities of value chain actors will be defined through the MSDP for each corridor.

Input Function Related Recommendations.

In this respect the study recommends;

a. Establishment of local feed production facilities at the input aggregation centres, supply drugs and vaccines as well as other forms of actionable knowledge to the farmers.

b. Use of white sorghum as feed production input is being recommended. If sorghum is going to be used as an input, out-grower programmes with farmers in the drier regions of the country need to be developed to ensure constant supply

c. Setting up commercially run transport systems overseen by the FBO's to ease logistical challenges for value chain actors.

d. The study recommends the growing of feed such as maize and barley under hydroponics.

e. Addressing of default risks regarding financial services through the FBOs based on group lending schemes, matching grants anchored on farmers' savings and other innovations attuned to pig production cycles.

Production Related Recommendations.

The study recommends the following regarding the production function;

Carefully structured farmer capacity development in pig production framed within the Training for Transformation paradigm. The gist of this orientation is to enable a mind-set shift among the pig farmers towards fully commercial focused production. The capacity building should aim at enhancing production and productivity through the adoption of technology based and cost-efficient production methods. The capacity building will further focus on collective marketing, finance management and use of digital solutions in

agriculture to enable smallholder farmers to truly benefit from the digital solutions. The capacity development methodologies will include look and learn visits, study circles, demonstration, coaching and mentoring.

To enhance learning and information sharing among the pork value chain actors the study recommends the setting up of an electronic platform "e-Hochi". This will be a mobile-based platform aimed at increasing access to markets and e-extension services. The platform provides 4-in-1 services. It aggregates farmers for input and output markets, financial and extension services. This platform will only be accessible to the members of the FBOs with capabilities for housing a database with farmers' biodata and production records in the system. The e-Hochi platform should also be able to serve other stakeholders through various connected services;

Setting up Best Model Pig Farms. The study advises the setting up of best model pig farms, where other pig farmers can learn best practices. These best model pig farms should have learning and training facilities, demonstration sites and breeding facilities. They will also act as pig breeding and finishing development centres. The Integrators and PIB will be best suited to support the establishment of the best model pig farms;

Adoption of the best production technologies in the industry for instance, automated precision feeder. These technologies will increase the efficiency in the use of feed and eventually enhance profit margins. Artificial Insemination (AI) is another technology that has potential to help reduce the costs associated with the keeping boars at smallholder farms. The study recommends that it be promoted through PIB and availed through the aggregation centres.

End-Market Recommendations.

At the end market, the scoping study recommends customer awareness campaigns on the benefits of eating pork meat and products. The intention will be to stimulate the demand for pork meat and related products. This campaign should be spearheaded by PPAZ, producer syndicates, large chain supermarkets and independent butcheries. These campaigns should also focus on informing the consumers the hazards of eating uninspected meat as part of encouraging the fair value farm branding which entails use of formal channels through which targeted support and regulation becomes possible.

Policy and Regulatory Recommendations.

The study recommends a holistic approach to resolving the policy and regulatory constraints aimed at enhancing the "Ease of Doing Business in the Pig Industry". This initiative is best driven by the Office of the President and Cabinet. This process should be driven by the PPAZ and syndicates in the two corridors. Relevant public and private sector stakeholders will be invited when appropriate. The Ease of Doing Business in the Pig Industry would focus on;

- Exploring devolved service delivery for animal movement and meat inspection;
- Revision of SI 145;
- Revisit import taxes and duties levied on raw materials used in pig production such as drugs, vaccines, soya meal and maize;
- Research on the potential use of ethno-veterinary practices;
- Enforcement of some of the regulations such as the Fertilizers, Farm Feeds & Remedies Act (Chapter 18:12) and Environment Management (Effluent & Solid Waste Disposal) Regulations of 2007.

Support Service Recommendations.

The support service providers (DVS, AGRITEX and PIB) were noted to have limited capacities, therefore the study recommends their capacity building in these areas;

a. Knowledge and skills competencies: The service providers especially from the public sector need enhanced subsector knowledge through exposure to the latest industry developments. This can be

achieved by providing computers (desk-tops) at district level with internet facilities. The staff can also receive training and go for look and learn visits in other jurisdictions.

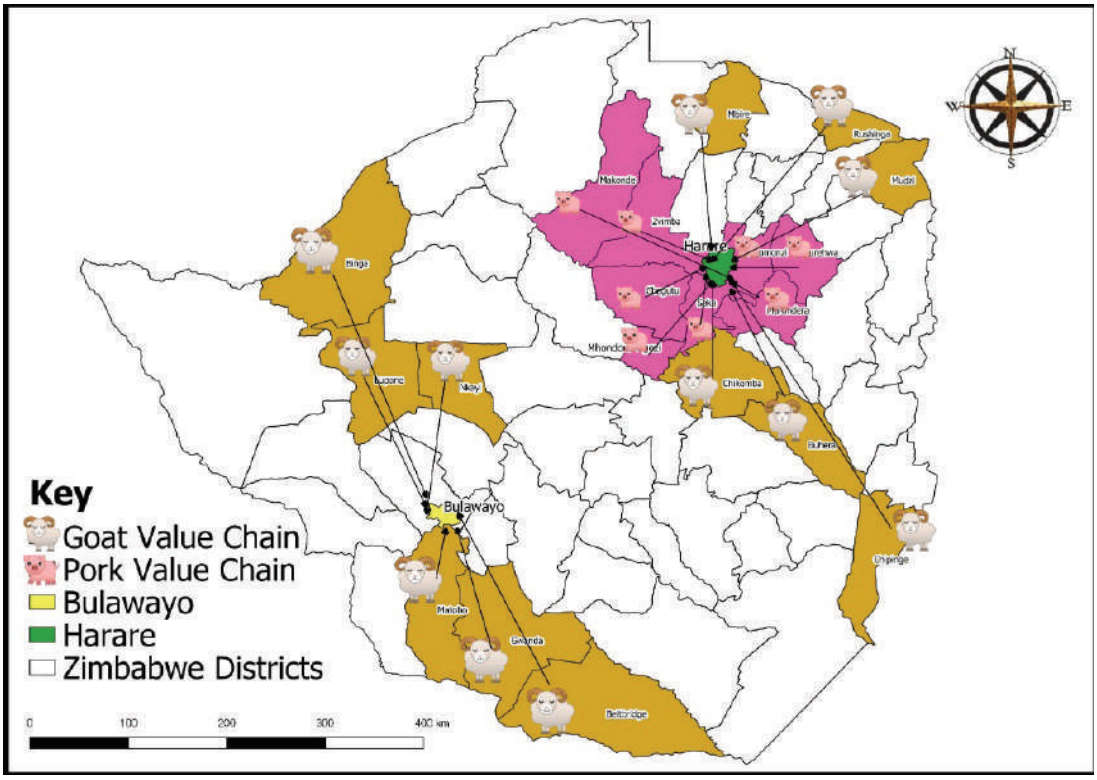
b. Mobility: Most of the extension personnel are not motorised. The study recommends support geared towards increasing their mobility. This support could be in the form of a market-based transport allowance system which is linked to specific deliverables of the project or provision of motorcycles for key staff.

1.0 INTRODUCTION

1.1 Background to the Scoping Study

The Value Chain Alliance for Livestock Upgrading and Empowerment (VALUE) project seeks to positively impact the economic status of 56 000 small to medium scale pig farmers. The targeted smallholder farmers are currently stuck at different suboptimal stages of commercialization and economic growth. The project will address value chain constraints related to financial, environmental, technological, organizational and market linkages, regulatory and policy constraints. VALUE project, with respect to the pork value chain is being implemented by ActionAid, as the lead partner Mercy Corps, Braford Farming and Shamiso Farms in eight districts of Mashonaland East and West provinces of Zimbabwe (see Figure 1) The VALUE project will run for four (4) years from February 2019 to January 2023. The project is funded by the European Union with cofinancing from the CIPS.

Figure 1



Braford Farming and Shamiso Farms are the project "integrators". An integrator is a value chain actor who has moved up the chain to assume other functions in the chain but without exerting more influence in the management of the chain[1]. In the context of VALUE project's pork value chain, the integrators are responsible for:

a) Maintaining and supplying pig blood lines to anchor and champion farmers;
b) Supplying six hundred (600) pig out-growers with weaners for finishing;
c) Farmer capacity building;
d) Supply chain coordination (backward and forward logistics)

[1] Royal Tropical Institute (KIT), Faida Market Link Company Ltd and International Institute of Rural Reconstruction (IIRR) 2016.

e) Off-taking pokers and stock feed ingredients via PPBS and bulk feed procurement manufacturing and sales.

To get a textured understanding of the value chain constraints, dynamics and to benchmark the project indicators, VALUE partners commissioned the Development Governance Institute (DEGI) to conduct the value chain scoping study exercise. DEGI is a Zimbabwe registered development, research and consulting company (Reg. No. 6813/2012) active in Eastern and Southern Africa. DEGI has interests in local governance, rural and urban development, economic development, social protection, agricultural development, housing policy and practice and civil society strengthening.

1.2 Purpose of the Scoping Study

The main objectives of the participatory, corridor-specific value chain scoping study were;

i. Assessing the economic, environmental, financial, social and natural aspects of the pig and goat value chains along the marketing corridors of Bulawayo and Harare;
ii. Baselining project monitoring and evaluation framework;
iii. Determining the key vulnerabilities in the Pork Value Chain (PVC) and Goat Value Chain (GVC) for purposes of building resilient Market Systems for all the value chain actors;
iv. Analysing the key gender issues around the pig and goat meat value chains (ownership, control, decision making systems, gender and market dynamics, gendered access to financing etc.)
v. Mapping of the VC actors and analysing the power dynamics between the different stakeholders in the goat and pig value chains
vi. Assessing the strength and weaknesses of value chain stakeholders including PPAZ, GBAZ, LMAC, Farmer Unions, Government line ministries and departments
vii. Assessing all stakeholder's/target groups, capacities, their strengths and weaknesses; and those of other stakeholders such as Government Ministries, mapping of VC actors, policy gaps, market assessments on competitiveness of PVC;
viii. Identifying the policy gaps in the PVC with a view develop an influencing and lobbying strategy for the project;
ix. Benchmarking the Fair Value Farming Brand parameters and establish the operational framework for use by the project.

1.3 Structure of the report

In this first section the report provides a study background, spells out the scope of the VALUE project and the study objectives. The second section covers the methodology employed to capture the deliverables of the study. It provides the conceptual framework underpinning the study and the study design. This section also presents actual methods and tools used for data gathering, spatial coverage in terms of the districts and wards sampled including the sampling logic.

The third section of the report presents study findings. It begins by providing an overview of the pork sub-sector at global, national and district levels. The overview ends with a map of the pork sub-sector from the VALUE districts to national level. Other sub-sections cover value chain functions that the study identified. These functions include input supply, production, slaughtering, processing, wholesaling and retailing and consumption. In this section, findings on the regulatory environment, value chain financing, fair value farming branding, the support service providers and their capacity challenges are also presented and discussed. This is followed by section four (last section) which provides recommendations based on the study findings.

2.0 METHODOLOGY

2.1 Conceptual Framework

Development of sustainable value chains offers important pathways out of poverty for the millions of poor households in developing countries. The value chain (VC) is an established paradigm in development thinking and practice. A sustainable value chain (SVC) is defined as:

> "the full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad-based benefits for society, and does not permanently deplete natural resources (FAO 2014).

The SVC concept simultaneously stresses the importance of three elements. First, it recognizes that VCs are dynamic, market-driven systems in which vertical coordination (governance) is the central dimension. Second, the concept is applied in a broad way, typically covering a country's entire product subsector (e.g. pigs, goats, poultry and cattle). Third, value addition and sustainability are explicit, multidimensional performance measures that are assessed at the aggregated level. The SVC concept was used to guide the pork value chain scoping study was guided by the value chain framework (VCF). The core of an agricultural value chain concept is about actors being connected along a chain producing and delivering goods to consumers through a sequence of activities.

2.2 Study Design

The scoping study used a mixed-methods research paradigm that incorporates both quantitative and qualitative methods. A mixed-method research paradigm was selected because of its ability to:

i. Take full advantage of the strengths of each method used,
ii. Combine in-depth understanding with representative numbers, and
iii. Integrate methodologies for better measurement, sequencing information for better analysis and merging findings for better action.

Quantitative data was collected through a survey questionnaire. The questionnaire was administered to two hundred and ninety-eight (298) pig farmers. Their responses were then uploaded and processed using the Statistical Package for Social Scientists (SPSS) for data management and analysis. On the other hand, qualitative data were gathered to contextualize and deepen understanding of the findings of the quantitative data in a sub-sample of communities from the sampled districts. The notes collected using qualitative data were transferred into matrices based on a topical outline. Processing of data into matrices enabled identification of important patterns in responses and specific contextual information. The matrices facilitated analysis of responses from FGD sessions and KII's by value chain actor and function (input suppliers, processors, integrators, policy makers and regulators).

2.3 Study Coverage

The data for the scoping study was gathered from four of the eight programming districts, which is a fifty (50%) coverage. The sampled districts were Chegutu, Mhondoro-Ngezi, Goromonzi and Murehwa. In each programming province, the study selected districts with the highest and lowest sow herd. In Mashonaland West, Chegutu had the highest (1326) and Mhondoro-Ngezi had the least (62) sow population. In Mashonaland East, Goromonzi had the highest (3089) and Murehwa had the least (291) number of sows.

In terms of sampling the wards, the study purposively sampled the wards with highest number of pigs to be able to get at least forty (40) respondents per ward. The wards that were sampled per district are shown in Table 1 below,

Table 1: Sampled Wards Per District	
District	**Wards**
Murehwa	12, 15, and 9
Chegutu	26,11, 22 and 21
Mhondoro-Ngezi	5, 1, 3 and 8
Goromonzi	16, 17 and 12

The study used different methods to gather data and these are shown in table 2 below

Table 2: Study Respondents by study method, institution and location

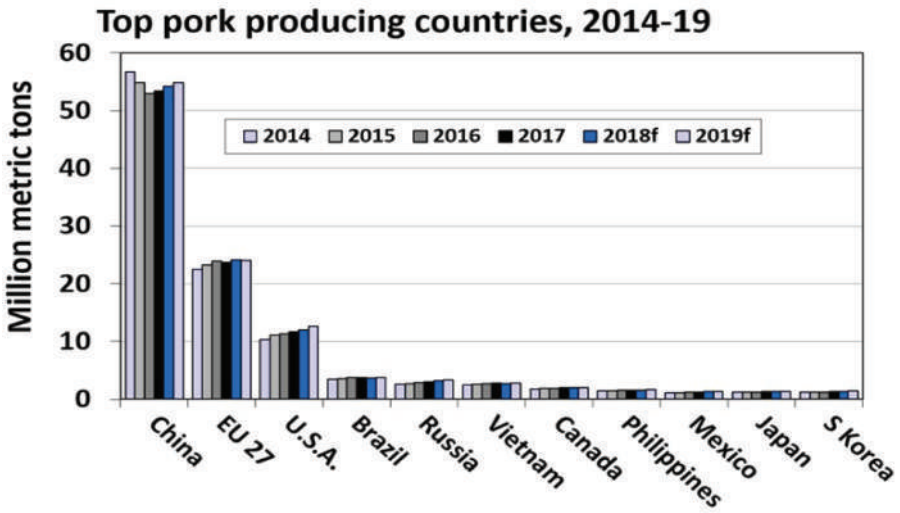
Scoping Study Method			Number of Respondents					
			Murehwa	Mhondoro-Ngezi	Goromonzi	Chegutu	National	**Total**
1. *Quantitative Survey Questionnaire*			69	42	92	94	0	**298**
2. *Focus Group Discussion Sessions*			2	2	3	2	0	**186**
3. *Key Informant Interviews*	Inputs Suppliers		4	0	3	2	0	**9**
	Financial Institutions		3	0	0	0	2	**5**
	LMAC		0	0	0	0	1	**1**
	PIB		0	0	0	0	1	**1**
	Integrators		0	0	0	0	0	**0**
	Local Authorities		1	1	1	1	0	**4**
	Government Departments	EMA	1	0	0	0	1	**2**
		AGRITEX	1	1	1	1	1	**5**
		SMEs	0	0	0	1	0	**1**
		DVS	1	0	0	1	1	**3**
Processors & Abattoirs			0	0	3	0	3	**6**
Wholesalers & Retailers			2	3	2	2	4	**13**
Consumers			**10**	**10**	**10**	**10**	**8**	**48**

3.0 STUDY FINDINGS

3.1 Overview of the Pig Sub-Sector

3.1.1 Global Trends

Pork is the most consumed animal protein in the world (Plain 2018). As the world population climbs along with disposable income the competition to supply the world with wholesome, safe pork is increasing. Together, the world's pig farmers produced 108.2 million metric tons of pork in 2017, according to the USDA Foreign Agricultural Service (2017). China, the European Union, the United States, Brazil and Russia lead the way, supplying 86% of the total production worldwide. In the past five years (2014-2018), according to Statista (2018) world pork production has increased by 3.854 million metric tonnes with the United States contributing to the largest growth at 1.290 million metric tonnes. European Union production climbed 924,000 metric tonnes, Russia's production was up 825,000 metric tonnes while Vietnam's production increased by 443,000 metric tonnes.According to USDA Foreign Agricultural Service (2018), China is the largest pork producer in the world producing more than 50 million metric tons per year since 2014. It is followed by the European Union's 27 pork producing members which are producing slightly more than 20 million metric tons per year since 2014. USA, Brazil, Russia, Vietnam, Canada, Philippines, Mexico, Japan and South Korea are amongst the top producing countries and are all bellow 20 million metric tons per year since 2014.



Source: USDA/FAS October 2018

In Africa, Nigeria and South Africa are the key pork producing countries, with an output of about 276 thousand tonnes and 246 thousand tonnes in 2017 respectively. Together they account for 35% of total output (IndexBox 2018). The other major producers are Malawi at 11.5%, Uganda at 8.8%, Mozambique at 8.5% and Angola at 8.0%. Malawi's production levels increased by +21.2% annually from 2007 to 2017 largely as a result of the state initiatives introduced to support pig production. These included encouraging farmers to create cooperatives to improve bargaining power, reduce costs and benefit from the improved extension services.

Other major producing countries also increased pork output. From 2007-2017, annual rates of growth remained especially high in Angola at 9.0% while South Africa at 2.9%, Nigeria +2.8%, Mozambique +2.6% and Uganda +2.2% recorded more moderate paces of growth. Malawi's +9 percentage points and Angola's +3 percentage points improved their position in terms of African pork production, while the other regional leaders remained relatively stable throughout the period 2007 to 2017.

3.1.2 National Trends

In Zimbabwe, pork production is practised by small, medium and large-scale commercial farmers in all provinces. According to the PIB, production is classified as small-scale production when farmers have less than fifty (50) sows, medium-scale farmers are those that rear 51 to 100 sow units while largescale farmers rear more than one hundred 100 sow units. In Zimbabwe, the pig breeds that are being reared are Large White, Duroc, Dalland, Landrace and the indigenous Mukota. According to PIB statistics (2019) the national sow herd is estimated to be around twenty thousand, two hundred and ninety-seven (20297). The distribution of the sows per province are shown in Figure 4 below.

Figure 4 shows that pig production is concentrated in the three Mashonaland provinces West. These provinces account for seventy-nine (79%) percent of the national sow herd. This is because in these provinces thus where the majority (soya and maize) of the pig feed is produced. The Matabeleland region has the lowest percentage, accounting for less than one (1%) percent. The region is dry and does not readily have the water required to run pig production.

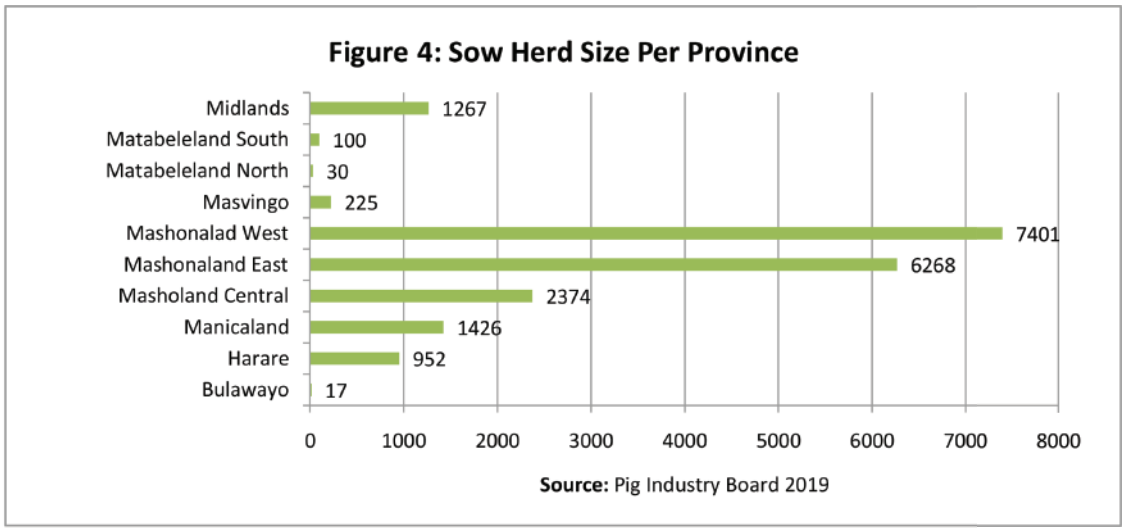


Table 3: Sow numbers by district

Natural mating is mostly practiced though artificial insemination (AI) services are available at the PIB and other commercial entities. AI services reduce risks and cost drivers associated with maintaining boars. The other farmers who practice Artificial Insemination on their farms and with semen that they process are Triple C, Davenport and Mangisi. Key among the players in pork production is the LMAC, an institution which pursues the following objectives:

- Protecting, promoting and enhancing the interests of those engaged in the livestock and meat industry in Zimbabwe,
- Ensuring the economic viability of the sector,
- Strengthening Auctioneers, Livestock Identification Trust, Pig Producers Association of Zimbabwe and Stock Feed Manufacturers Association of Zimbabwe.

The other subsector stakeholders include the Zimbabwe Association of Abattoirs, Zimbabwe Herd Book, Meat Processors Association of Zimbabwe, Market Linkages Association and PPAZ. Additional service providers include the government departments responsible for livestock production, veterinary services, economics and markets, the Animal Health Industry Committee and farmers' organizations (Commercial Farmers' Union, Zimbabwe Commercial Farmer's Union and Zimbabwe Farmers' Union).

The demand for pork in Zimbabwe is high, about 1000 metric tonnes per month according to StartupBiz (2015). White breeds contribute 75% of total pigs slaughtered annually. Duroc and other breeds contribute the remaining 25%. The number of slaughtered pigs increased by 2,7% in the first half of 2018 compared to the same period in 2017, an indication that the sector has been picking up following the drought experienced in the 2015/16 cropping season according to Nyoni (2016). Pork produced during the first half of 2018 was 11.6% higher than for the same period in 2017. The quantity produced through registered abattoirs increased by a bigger margin than the number slaughtered, indicating that on average heavier pigs were slaughtered during the first half of 2018 than during the same period in 2017. PIB Director Andrew Shoniwa (2018) noted that in the first six months of the year, a total of 79 780 pigs were slaughtered at registered abattoirs. In 2018, the producer price was ranging from USD3.50 to USD3.65 per kg.

3.1.3 Trends at Disctrict Level

Goromonzi, a VALUE project district has the highest number of sows in the eight (8) program districts as shown in Table 3. It has three thousand and eight-nine (3089) sows according to PIB 2019 statistics. The high sow herd is attributed to interventions by the PIB. Among all the program districts Mhondoro-Ngezi has the least sow herd at sixty-two (62). The low sow herd is because pig production is a recent phenomenon in Mhondoro-Ngezi district.With respect to access to abattoirs, Goromonzi is well served. The pig farmers in the district have access to Ziyadhuma, PIB and Tilisa Abattoirs. In Chegutu and Mhondoro-Ngezi districts the pig farmers rely on Koala and Tauya Abattoirs in Kadoma. The farmers noted that the Kadoma-based abattoirs are far away and therefore the associated costs affect their business viability. In Murehwa district there is no registered abattoir resulting in farmers using informal abattoirs and slaughter facilities. Farmers also reported that they slaughter their animals on their farms and then sell directly to the local butcheries and the public. However, the meat will not be inspected, which is against relevant regulations.

District	Number of Sows
Zvimba	624
Chegutu	1326
Makonde	80
Mhondoro-Ngezi	62
Goromonzi	3089
Marondera	663
Murehwa	291
Seke	434

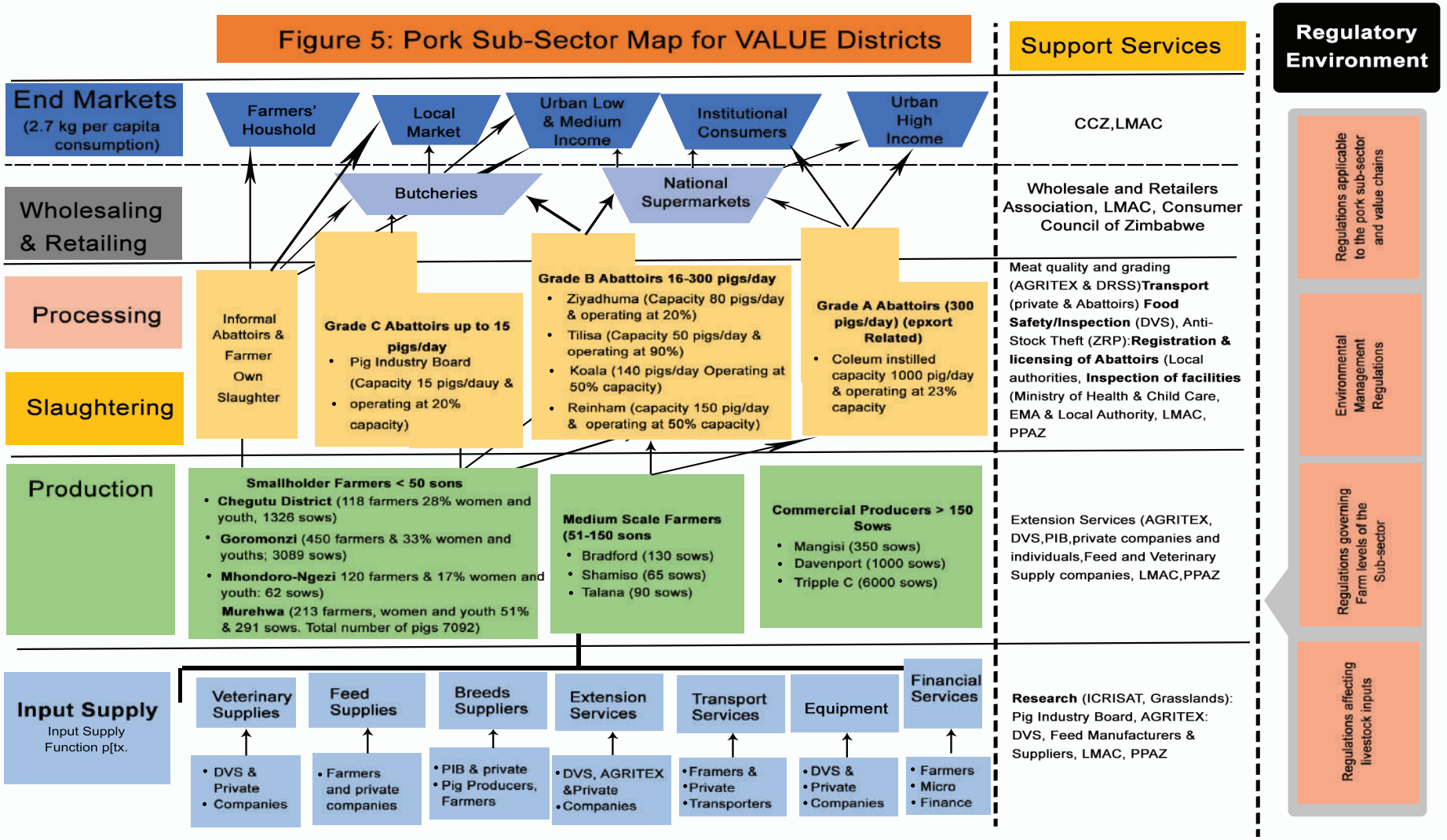
Source: PIB 2019

3.2 Sub-Sector Map

The study developed a map of the pork sub-sector for the VALUE program using the data gathered. The main pork sub-sector functions are i) input supply, ii) production, iii) Slaughtering, iv) processing and v) wholesaling

and retailing and vi) consumption. The pork-sub-sector map is shown in Figure 5 below with these functions elaborated in the subsequent sections of this inception report.

Figure 5: Pork Sub-Sector Map fwith Functions and Actors



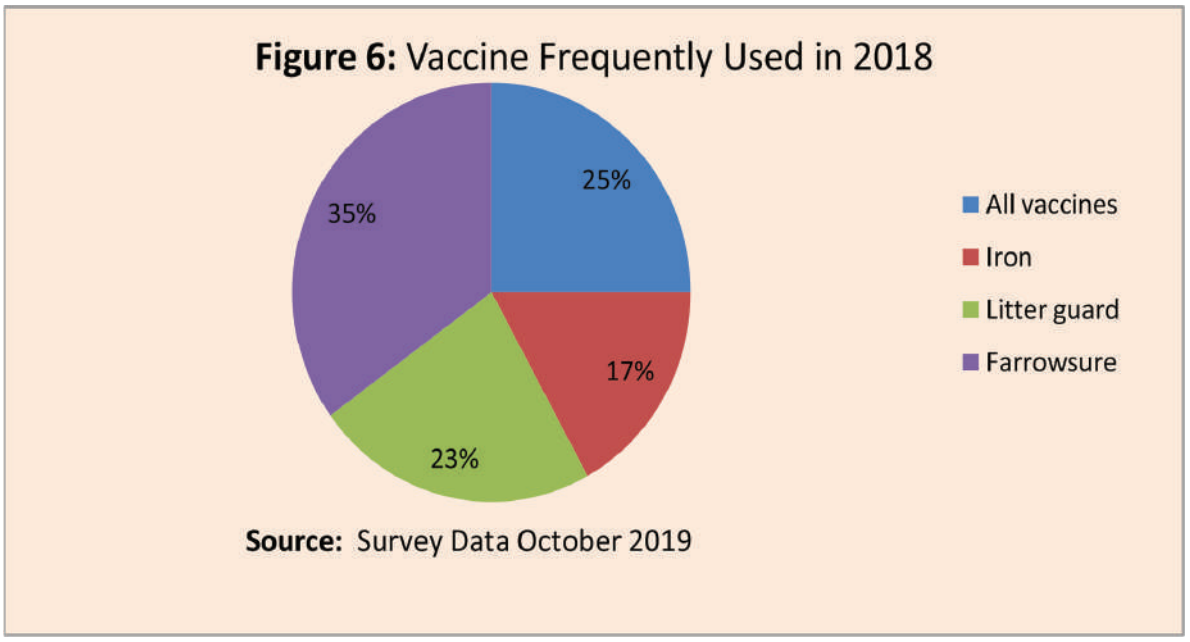
3.2.1 Input Supply Function

The input supply function of the pork sub-sector includes veterinary and feed supplies, provision of breeding services and stock, extension and transport services as well as equipment provision.

3.2.1.1 Veterinary Supplies

Veterinary services involve the supply of drugs (including antibiotics) and vaccines for the animals. The study found that provision of these drugs and vaccines is done by the DVS and private veterinary companies (e.g. FIVET, Veterinary Distributors) and feed suppliers (e.g. ProFeeds, Capital Foods and FeedMix). The feed suppliers are also providing the drugs and vaccines and are usually doing so through the linkages that they have with the private veterinary companies, the study noted. This is the case with Feed Suppliers such as Farm and City, Capital Foods and Profeeds. The feed suppliers act as agencies of the veterinary companies. DVS participation in supplying of drugs and vaccines has gone down over the years because of the limited budgetary support given to the department by the Treasury. DVS used to supply these drugs and vaccines through its Animal Health Centres across the country.

The frequently used drugs and vaccines are shown in Figure 6. The farmers raised concern over the availability and the cost of drugs and vaccines. The major challenge with veterinary supplies is the packaging and quantities available. For instance, the drugs mostly available are the fifty (50) dose packages. This is not appropriate for most of the small-scale farmers whose herd is less than fifty (50). As a coping strategy, the farmers are forming groups to buy the fifty (50) pack drug doses. The study learnt that there used to be ten (10) and twenty (20) pack drug doses, which were relevant to the small-scale pig farmers. The challenge with the groups approach for the 50 pack drug doses is that drug and vaccine effectiveness may get compromised during administration. These small packages have been removed from the market because of the expensive packaging.



The costs of the drugs and vaccines are also prohibitive as they are beyond the financial capacity of the small-scale producers. This was evidenced by the low purchase volumes noted by the study. Of the sampled ten (10) veterinary suppliers only two (Capital Feeds 0.5kg in Goromonzi and Profeeds 2kgs in Chegutu) had made sales during the month when the study was carried out. In terms of coverage and penetration by the providers of veterinary supplies, the study noted that most districts are well covered, except for Mhondoro-Ngezi. The district does not have suppliers of veterinary drugs and vaccines.

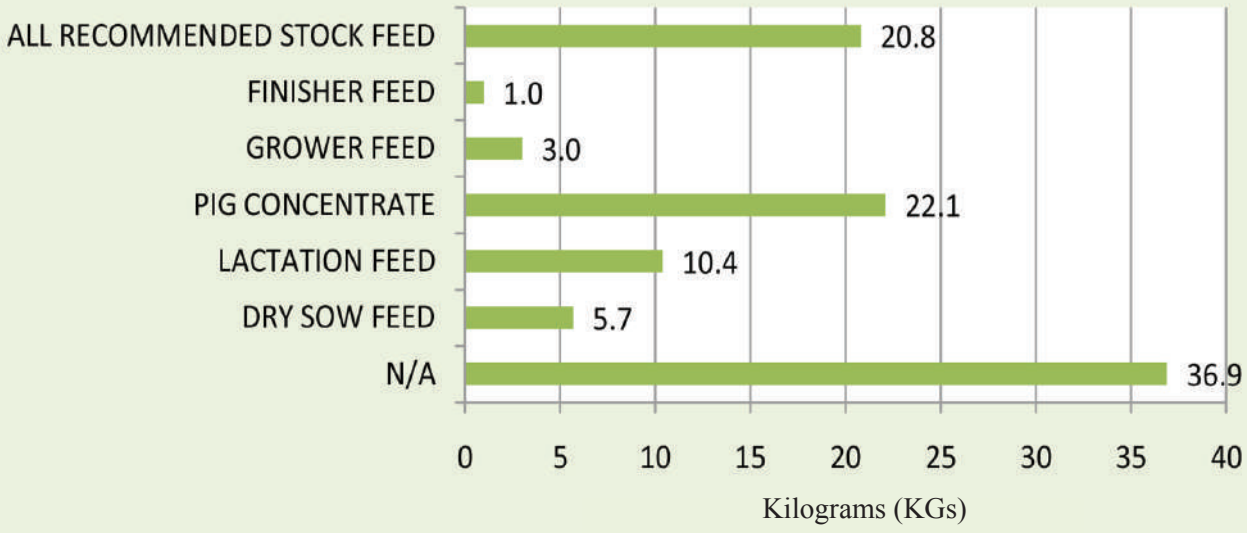
3.2.1.2 Feed Suppliers

The main feed suppliers that the study found in the sampled districts were Capital Feeds, Profeeds, Farm and City, Country Feeds (subsidiary of GMB) and FeedMix. These companies have retail outlets in urban centres and at growth points in rural areas. This makes them relatively accessible to the farmers. Individual general dealer shops and hardware shops are also supplying feed to the pig farmers. Feeds constitute between 60% and 80% of the production costs. This includes complete pig feeds, concentrates, pre-mixes and feed additives among others. The major ingredients are maize (60%) and soya meal (20-27%).

The study found that most of the sampled farmers (36.9%) did not purchase commercial feed as is shown in Figure 7. Those that did not purchase feed reported using feeds made at the farm. This indicates that the practice of making one's feed for the animals is institutionalized among the farmers. Farmers that are using pig concentrate constitute slightly over a fifth (22.1%) of the sampled farmers. Farmers that bought all the recommended feeds constitute twenty-one (20.8%) percent of the farmers. The least purchased at 1% is finisher feed.

The supply of feed is constrained by the current shortage of maize and soya meal on the market. Zimbabwe is experiencing maize shortage due to the current climate induced droughts. Given the current maize shortage in the country, the Government is prioritising human food security. Therefore, the pig farmers do not have access to maize. In a normal set-up, the pig farmers should be getting the maize from the GMB at the same price as the millers.

Figure 7: % of Feeds Purchased by Farmers



Source: Survey Data October 2019

The ability of farmers to purchase the maize at the millers' price is further affected by the registration fee required of farmers. The pig farmers are required to pay a registration fee (USD13.3)[2] to GMB for them to be able to purchase the maize at the same reduced prices as the millers. However, the farmers mentioned that this is beyond their financial capacity. Regarding soya meal, the country has been importing for the last three (3) to four (4) years. The landing price (USD500 per tonne) of the soya meal, makes it unaffordable for the majority of small-scale pig producers. The small-scale farmers cannot access feeds for their animals.

[2] This is once-off payment.

In such instances of feed shortages and high costs, the study found that some of the pig farmers have developed their adaptive strategies that include the use of crushed maize without concentrates, damba weeds and maize jam[3]. These poor-quality feeds are a serious constraint in pig production in Zimbabwe. The study found that the veterinary and feed suppliers have adopted information communication technologies (ICTs) for interfacing with their clients, the pig farmers. The suppliers are now using Facebook (e.g. Capital Foods) and creating WhatsApp groups.

3.2.1.3 Breeding Stock

The other input required to produce pigs, is the provision of the breeding stock. The country does not have pig breeders. Currently PIB is the only official and reliable source of breeding stock for farmers but lacks resources to import new genetics enough to supply existing and potential pig farmers. However, there are organizations that provide breeding stock. The study found that the majority of the small-scale farmers use their own or their neighbours stock. Furthermore, 38.6% and 23.8% of farmers are using own boar and or neighbours' respectively for breeding purposes. The actors involved in the provision of breeding stock are PIB, Art-Farm, Triple C (the latter to selected farmers), Braford Farming, Shamiso Farm, Munda Farm and Mangisi Farm. PIB has an annual target to supply 660 gilts, 240 boars as breeding stock and 2000 doses of semen. The pig industry is also importing breeding stock, especially from South Africa. The companies that are providing the breeding stock from South Africa are Topigs, Danbred and the Pig Improvement Centre (PIC). These companies provide parent and grandparent breeding material.

3.2.1.4 Equipment

Equipment constitutes some of the inputs required for pig production and this includes ear notchers, side cutters, stainless scissors and weighing scales among others. These are supplied by private sector players. The challenge with equipment is the shortage of supplies with the majority being imported. This is in the face of current foreign currency shortages which are negatively affecting the availability of the required equipment.

3.2.2. Production Function

The pig industry has grown steadily since independence. However, over the years like any other livestock subsector in Zimbabwe, pig production has been declining. Since 2013 the national sow herd has been increasing over the years with the current sow herd estimated to be 20 297 according to PIB (2019) statistics. Production sector consists of a few largescale commercial farmers (e.g. Mangisi, Davenport, and Triple C) several medium-scale producers and numerous small-scale semi subsistence producers. The pigs in the smallholder sector are estimated to comprise about 80% of the total pig population in Zimbabwe (PIB 2019).

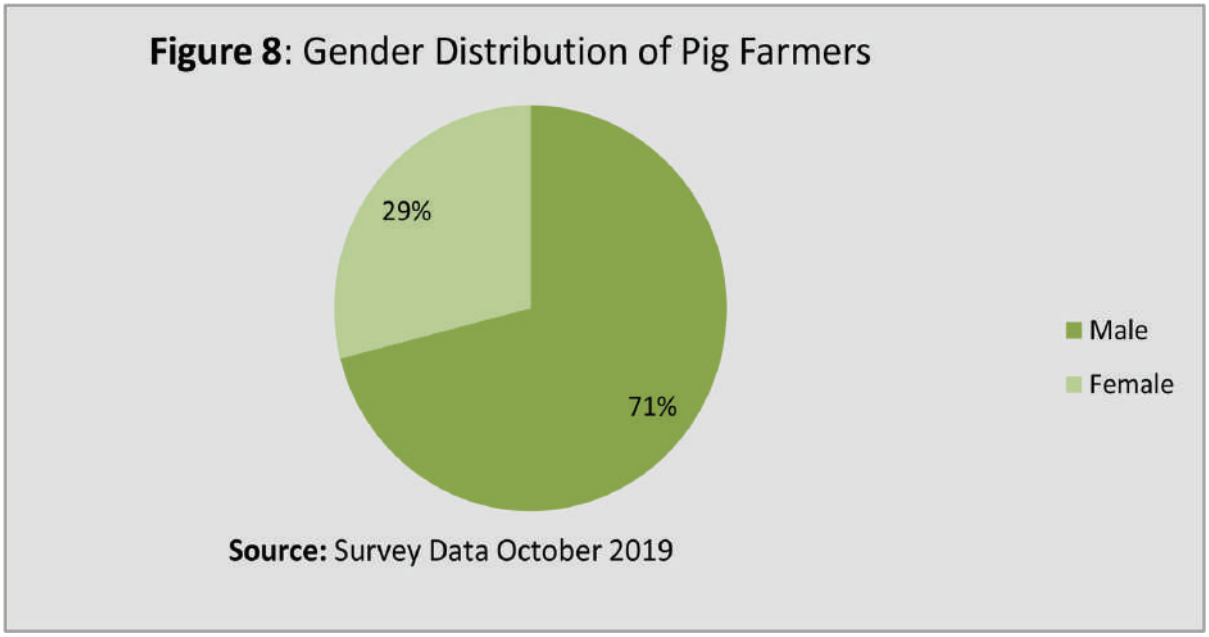
3.2.2.1 Biography of the Pig Farmers in the VALUE Project

Pig farmers in Zimbabwe are classified into small-scale, medium-scale and large scale. The large-scale pig producers are the commercial units. In this category, there are Triple C (6000 sow herd), Mangisi Farm (350 sow herd), and Davenport (1000 sow herd) farms. In the medium-scale pig production category, there are Braford Farm (130 sow herd), Shamiso Farm (65 sow herd) and Talana (90 sow herd) and Mralasi (125 sows) among others. Among the sampled districts, Chegutu has the highest average sow-herd of eleven (11) per farmer and Mhondoro-Ngezi and Murehwa have the lowest average sow-herd of one (1) per farmers.

The gender distribution of the farmers is tilted in favour of men. Most of the pig farmers are men constituting seventy-one (71%) of the pig farmers as indicated by Figure 8. Whilst men seem to be dominating pig production, the study further shows that seventy-eight (78.5%) percent of the farmers are married. This points to the fact that most of the pig production is run as a "family enterprise". This point was buttressed in the FGDs,

[3] Spoiled maize from GMB

where it was pointed out that the pig production businesses functioned as family enterprises. The major source of livelihood for the sampled farmers is agriculture accounting for forty-one (40.6%) percent of the farmers income. The second highest source of income was salaried income (14.4%). The study further noted that the farmers are investing some of the income from their jobs in their pig enterprises.



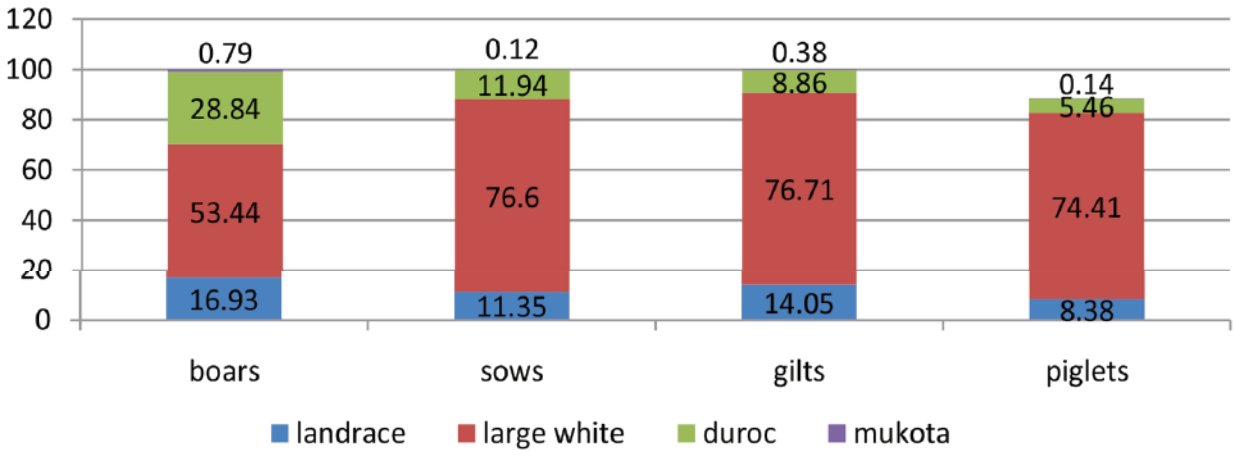
The need for cash on a regular basis motivated forty-eight (47.8%) of the farmers to engage in pig production, whilst fifteen (14.8%) of the farmers were driven by the need to have meat for household consumption. The high number of farmers driven by the desire to have cash on a regular basis is a good foundation for the commercialization of pig production amongst the smallholder farmers. The majority (36.6%) of the farmers are youths aged 18 to 35 years, followed by those aged 36 to 50 years at 33.2%. The high presence of youths in pig production points to greater growth potential as the youths have high propensity for learning and adoption of latest production technologies.

3.2.2.2 Breeds

Farmers are breeding Landrace, Large White (Yorkshire), Duroc and Mukota pig breeds. The Landrace breed is known for high productivity rates. It can farrow and raise large litters. The Landrace exceeds all the other breeds in body length. The Yorkshire is referred to as the mother breed because of its high propensity to produce offspring and mothering capabilities. Duroc breed is known for its high food convention ratio, which enables it to grow effectively on less food compared to other breeds. The Mukota breed is highly resilient to diseases and can survive on basic nutrition and little waters.

Scoping study data (Figure 9) indicates that of the most kept boars (53.4%) are Large White, followed by Duroc (28.9%), then Landrace (16.9%) and lastly the Mukota (0.8%). The dominance of the Large White breed is throughout the herd composition (sows, gilts and piglets). White Large White breed is kept because of its productivity. The Mukota breed is the least kept by farmers in the scoping study sample. This is because the farmers are becoming commercially oriented. The Mukota breed is not ideal for commercial production unless one finds a niche market for it that offers competitive prices.

Figure 9: Herd Composition By Percentage



Source: Survey Data October 2019

The majority (67%) of the boars kept by the farmers are below two (2) years old, which is the high productivity age. The majority (57%) age of the sows kept by the famers are within the two (2) year age limit. Statistics indicate that most of the farmers practice good husbandry practices in terms of maintaining productive boars and sows. Keeping of productive boars and sows is a crucial ingredient for pig commercialization. The study noted as mentioned in the input functions, that the pig genetics that the country is using are tired and old. This is because of the absence of breeders in the country.

3.2.2.3 Pig Production Systems

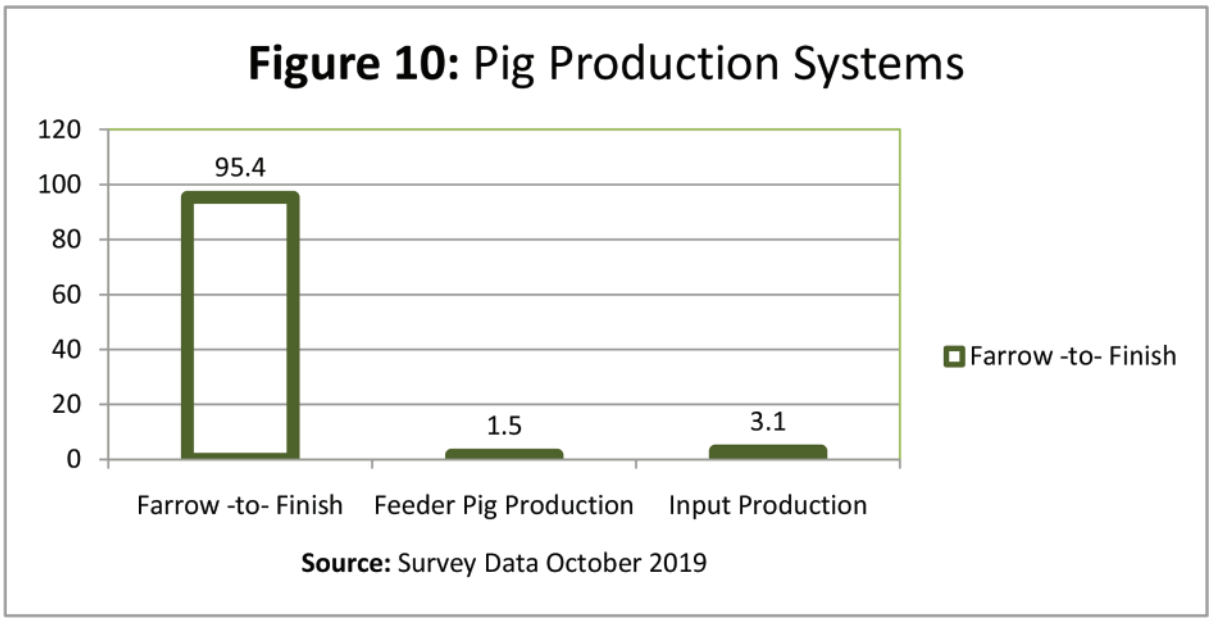
With regards to pig production, there are seven methods used by pork producers. These are farrow to finish; farrow to wean, feeder pig production; weaner to finish; seed stock production; purebred production, and alternative market production. Farrow-to-finish production systems involve all phases of pork production. A producer breeds sows on the farm, maintains them through gestation, farrows them, weans the piglets, feeds the pigs to market weight, and sells the pigs. Farrow-to-wean system of production involves the breeding, gestation, and farrowing of sows. The piglets remain with their mother sows until weaning at approximately 15 to 20 days of age. Once weaned, the pigs are sold to a wean-to-finish operation. Feeder pig production systems involve the breeding, gestation, and farrowing of sows, the weaning of piglets, and the maintaining of the pigs until they reach the 23-to- 27 kilograms range. The pigs are then sold on the open market to producers wanting to feed larger weaned pigs to market weight. In the wean-to-finish production system, producers purchase 15-20 days old pigs and raise them to market weight.

Seed stock production systems are a means of supplying replacement females and, in some cases, replacement males to operations that involve the farrowing of sows. Because of the use of artificial insemination, males are not as commonly raised for replacements. Only a few males are needed to breed many females, so fewer are raised for this purpose. The females are bred with specifically selected genetics and are managed very closely to obtain the best possible replacements. Purebred production systems typically involve all the aspects of farrow-to-finish production except a single breed is used to raise market animals. Purebred production systems also occasionally raise purebred replacement animals. Alternative market production systems are relatively new, having been developed within the past 10 to 20 years. The methods of production are similar to those of farrow to finish, except for management and marketing techniques. Alternative producers raise pigs to be sold in

specialized markets where consumers have specific demands. Included in alternative market production systems may be the raising of antibiotic-free and growth-stimulant-free market animals. Some consumers are willing to pay significant premiums for meat from these types of animals.

The pork value chain scoping study found that in VALUE districts there are three production systems. These are farrow-to-finish, feeder pig and input (contract) pig farming production systems. Further, majority (95%) of farmers are involved in Farrow-to-Finish production systems, whilst two (1.5%) of the sampled farmers were engaged in Feeder pig production.

Three (3.1%) percent of the farmers are using the input production system. The high (95%) number of farmers in the farrow-to-finish production system is not by design. In the FGD sessions held with the pig producers, the farmers noted that they would prefer the off-taker production systems. In the off-taker production system, the farmers are either linked to the input and or the output markets. However, the farmers noted that there are no off-takers interested in engaging with the smallholder farmers, because of the associated high transaction costs associated with dealing numerous, dispersed smallholder farmers with low productivity.



The farmers who participated in FGD sessions recommended the setting up of aggregation centres at selected points at ward and district levels. This will reduce the transactions costs incurred by the off-takers according to the farmers.

3.2.2.4 Pig Production Method

Pig production is broadly classified into intensive, semi-intensive and free ranging (scavenging). Intensive pig farming can be practiced on a comparatively far smaller area that the other two. In intensive pig farming animals are kept in close proximity to each other in a housing system. It is more suited to farmers aiming to supply the meat market. The idea is to grow the pigs to slaughter weight as soon as possible to save on long-term feed costs. The quicker one can get animals to slaughter weight, the less money they spend on feed. In free ranging pig production pigs are left out of their housing during the day to fend for themselves. Semi-intensive pig production method is a mixture of intensive and free ranging production method.

Data for this study indicates that pig farmers practice all the three production methods. The data indicates that eighty-eight (88.4%) percent of the farmers are practicing intensive production method, whilst eleven (11.1%) percent are engaging in semi-intensive production while one (1) percent are involved in free-ranging production method. The presence of high (88.4%) percent of the farmers practicing intensive pig production is a bedrock

for commercialization of small and medium scale pig production. The VALUE project can build up this existing intensive production method as a launch pad.

3.2.2.5 Pig Housing

This is set-out in Section 4 of the Animal Health Act (African Swine Fever) gazetted in 1994. It specifies that no pig maybe kept on any place except in facilities approved by the Director of Veterinary Services. According to the PIB a standard pigsty is constructed based on the space requirement for each class of pig. A boar stays alone in a space of 7.5 to 9 square meters. Sow space is 2 to 3 square meters and they stay in groups of 3 to 5 in a pen, Grower up to 100kg is 0.73 to 0.93 square meters and the whole litter occupies one pen. The number of pens per different sow herd is shown in table 4 below.

Table 4: Number of Pens Required Per Sow Herd

SOW HERD SIZE	NUMBER OF PENS REQUIRED
3	6
5	9
10	17
15	22
20	29
25	32
30	39

Source: PIB (2019)

The other specifications to be considered in the construction of pig housing are the floor slope (4% to facilitate good drainage), floor type (rough wooden float finish to avoid slippery floors); walls (first meter from the floor to be skimmed so that whenever pigs are scratching they do not get bruised), orientation (block to be East-West direction to avoid direct sun on pigs as white breeds are susceptible to sunburn. End walls facing east and west to be constructed up to the roof) and drainage (directed Westwards or Eastwards or Southwards so that foul smell does not come to the pigs since it can attract flies that transmit diseases). The size of pig housing infrastructure should also be strong, simple and adaptable.

Figure 11: Brick under Iron Pigsty

Figure 11: Log under Iron Pigsty

The scoping study found that most 97%of the pig farmers have pigsties where the pigs are kept. Difference 3% did not have pigsties, mainly new farmers who have not yet constructed the necessary housing but had pigs at the time of the study. These pigs are either kept at a neighbour's pigsty or the pigs are jointly kept together with those of their parents.

An assessment of the housing structures among the pig farmers revealed a plethora of materials that are being used to construct these houses. The scoping study observed that 75% of the pigsties of bricks under iron roofing sheets, 12% of the farmers kept their pigs under brick and thatch, 8% of the farmers housed their pigs in poles under thatch and 3% of the pig houses are made out of poles under thatch. Some of the pig houses that the study saw is shown in figure 11 (above). A qualitative assessment of the pigsties indicated that the majority (75%) of them did meet the standards set-out in the pig housing models developed by the PIB. The failure to meet the standards prescribed in the models was attributed to the associated costs of constructing the model pigsties according to FGD session participants. They recommended the development of pig housing models that are cost effective and enabling commercialization of pig production.

3.2.2.5 Breeding Practices

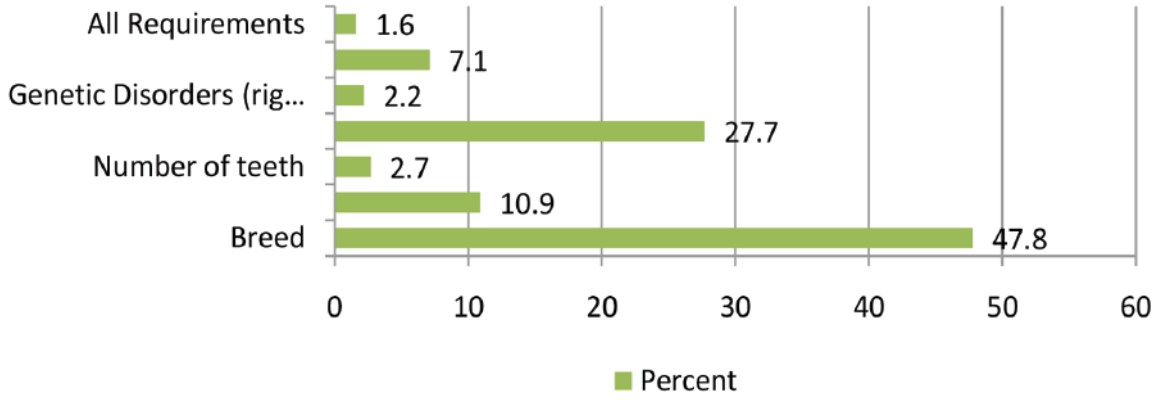
Breeding or mating systems are the approach taken to pairing a boar and a gilt or sow for breeding in order to incorporate or maintain desired traits. There are two main types of mating strategies-positive assortive mating and negative assortive mating. In positive assortive, mating is like to like in order to narrow the genetic pool so that the desired traits express themselves more frequently. In negative assortive mating unlike to unlike are mated to correct a deficiency or improve expression of a specific trait. Through these mating strategies five basic breeding practices arise and these are;

i. Inbreeding: where breeding individual animals mating are very closely related within the breed.
ii. Linebreeding: a form of inbreeding which attempts to concentrate the inheritance of one ancestor or line of ancestors within a herd.
iii. Outcrossing: breeding individuals that are less closely related within the breed.
iv. Random mating within a breed: mating individuals within a breed without considering their pedigree.
v. Crossbreeding: a planned approach to mating pigs of very different genetic backgrounds which typically results in heterosis. Heterosis is the improved performance of offspring compared to the average of their parents (NSIF, 2003).

With respect to the breeding strategies, the study found that the sampled farmers are not following distinctive practices. It is a mixture of all the five strategies. However, what was evident is that the farmers are concerned about enhancing their productivity through a conscious process of selecting breeds. The study data indicates that 97% of the farmers look for specific breed traits and attributes when selecting boars and gilts for breeding. The search for breed traits and attributes to enhance productivity, points to existence of commercial mind-sets amongst farmers.

In selecting the boars for breeding, 48% of the sampled farmers mentioned that they look for the breed type (see Figure 12). In Zimbabwe the Large White is the preferred breed because of high productivity levels. The other breeding traits and attributes that the farmers consider are overall physique for 28% of the respondents i.e. height and weight in relation to age. 11% of the farmers noted that they also consider body confirmation when selecting a boar for breeding.In the selection of the gilts for breeding, 94% of the farmers mentioned that they considered the number of teats. The three most considered gilt traits are the physique of the animal 29%, number of teats 24% and the breed 21%.

Figure 12 Specific Characteristics Looked for When Selecting a Boar for Breeding



Source: Survey Data October 2019

Whilst the farmers reported careful selection of their breeding stock, there is very limited 1% use of artificial insemination (AI) as a breeding method among the sampled farmers. The limited use of AI is attributed to the non-availability of the semen and the associated high costs of bringing it to the production site. The electricity challenges that the country is experiencing is further compounding the availability of pig semen. The few providers of semen in the country include PIB, with a target of supplying 2000 doses of semen annually. Triple C is also a service provider in this respect. The study found that Triple C is very selective in it support targeting. Braford Farm reported using semen for its own breeding purposes.

The most used method of breeding is the use of one's boar. 59% of the farmers reported using their own boars for breeding. This is because of the absence of breeders and breeding stock in the country. The study noted that 36% of the farmers are using their neighbour's boar for breeding. This is because of the shortage of boars. This practice of using neighbour's boar is intended to reduce in-breeding. The farmers who are using both AI and boars were 4% percent of the sample size.Under the breeding practices, data analysis revealed the following variables;

a) Boar-to-Sow Ratio.

Taylor and Roese (2006) contend that the boar to sow ratio is usually one boar per 20 sows with supervised hand mating. However, they further advise that in small herds, the ratio could be between 15 and 18 sows per boar. The study results indicate that the average boar-to sow ratio is 1 as to 9.2. This figure is below the industry standard of 1:15. The average is being pulled down by small-scale farmers whose ratios are 1:7.4 for males and 1:7.5 for both males and females respectively. Whilst the champion and anchor farmers are close to the industry benchmark, women champions exceed the industry benchmark at 1:16.25.

Table 5 Boar-Sow Ratio Per Farmer Category

	Champion	Anchor	Small-Scale
Male	1:11	1.12.87	1:7.4
Female	1:16.25	1:13.4	1:7.5

Source: Survey Data October 2019

b) Average Piglet Birth Weight (kgs).

The birth weight of a piglet is associated with its potential to make a profit for the pig farmer. This potential is called the "Route to "Profit" (Mabry 2015). Researches show that if a piglet was 1.4 kg or higher in birth weight their performance and potential for survival and profit was very good. As a pig's birth weight got below 1.4kg the route to profit became less probable. Researches[4] are further showing that that for each decrease in piglet birth weight of 0.1kg, the consequences are;

1. The pre-weaning mortality increased by 3%.
2. The post-weaning mortality increased by 2%.
3. Market weight decreased by 1.63kg.
4. The probability of it being a 'Full Market Value' pig decreased by 2%. Full Market Value' pig as one that weighed more than 90kg, had no injuries, ruptures or other defects, and received full market value at the slaughterhouse.

In Zimbabwe, the industry piglet birth weight is 1.5 kgs. The study found out that the average piglet weight for the study is 1.63kgs. Female sampled farmers in the 36-50 age category have the highest average piglet birth weight of 1.74 kgs ad the males in the 51-60 age category to the average piglet weight (1.69kgs) in the male category. The least (1.43kg) average piglet birth weight is among males in the 15-35 age category. This is probably because this age (18-35) category are the youths and are still learning pig production.

c) Weaning Weight (kgs).

Weaning weight is an extremely important component of weaning capacity and also has a major influence on growth and feed conversion efficiency from weaning to market (www.pigsite.com). An increase in weaning weight of 0.5kg, which is possible on many farms, can boost weaning capacity by up to 35kg. In Zimbabwe the weaning weight is 7kg. The average weaning weight among the scoping study's sampled farmers is 8.3kgs. This indicates that the farmers are generally doing good management practices.

d) Age at weaning (days).

The average weaning age in the pig industry is 35 days. In the scoping study sample the average weaning days is 34.8 days. This average is with the acceptable standard deviation from the mean of 35 days. The average weaning age by age was lowest (31.2 days) among males in the 36-50 age category. The gender and age category with the highest average weaning length are females in the 61+ age category at 39.4%.

e) Litter Size.

Sows ovulate 15 to 20 ova and the fertilization rate is over 90%. As a result, sows begin pregnancy with about 14 to 19 embryos. However, by farrowing, 30 to 40% of the embryos initially present have died. The pig uterus appears to be capable of carrying 12 to 14 foetuses to term (A.E. Pusateri, M.A. Diekman, and W.L. Singleton 1996). The pig industry in Zimbabwe has set the average litter size at plus 12. The average litter size per sampled farmers is 12.2. Surprisingly the age category with the highest (11.9) average litter size are males in the youth age (18-35) category.

f) Weaning to Mating Interval (days).

The weaning to mating interval measures the number of days between weaning and breeding a sow. In normal conditions, a sow should not take more than a week to be in heat and be mated after the weaning of its piglets.

[4] https://thepigsite.com/articles/impact-of-piglet-birthweight-on-profitability (visited 1 November 2019 0700 hours)

The Pig industry has set the weaning to mating interval at 7 days. The average weaning to mating interval is 19 and as such the study results show a figure above the industry standard

Table 6 Weaning to Mating Interval by Gender & Age Category				
	18-35	36-50	51-60	61+
Male	14	15	19	20
Female	19	38	21	6

Source: Study Survey October 2019

The high weaning to mating interval is attributed to poor management practices and shortage of boars. The Study figures further show that only females above 61 years are the only farmers with (6 days) the average weaning to mating ratio within the industry bench. This has been accounted by experience gained through the many years of practicing.

g) Number of Farrowings per year.

The accepted farrowings per year in the pig industry is 2.2. The study data shows that the average number of farrowing per year is 2.1, which is within the acceptable standard deviation from the mean of 2.2 acceptable in pig production. The number of farrowings per year by gender and age category is shown in Table 7

Table 7 Farrowings per gender and Age				
	18-35	36-50	51-60	61+
Male	2.27	2.26	2	2
Female	2	2	2	2

Source: Study Survey October 2019

h) Mortality.

The average piglet mortality is 55.2%. This figure is way above the industry benchmark of less than 10%. The small-scale farmers are experiencing higher mortality rates due to poor management practices pull up the average piglet mortality. The male farmers in the oldest (61+) age category have the highest piglet mortalities of 82%. The females in the youth category have the least mortalities of 42%.

Table 7 Farrowings per gender and Age				
	18-35	36-50	51-60	61+
Male	2.27	2.26	2	2
Female	2	2	2	2

Source: Study Survey October 2019

J) Dead Weight Feed Conversion (DWFC).

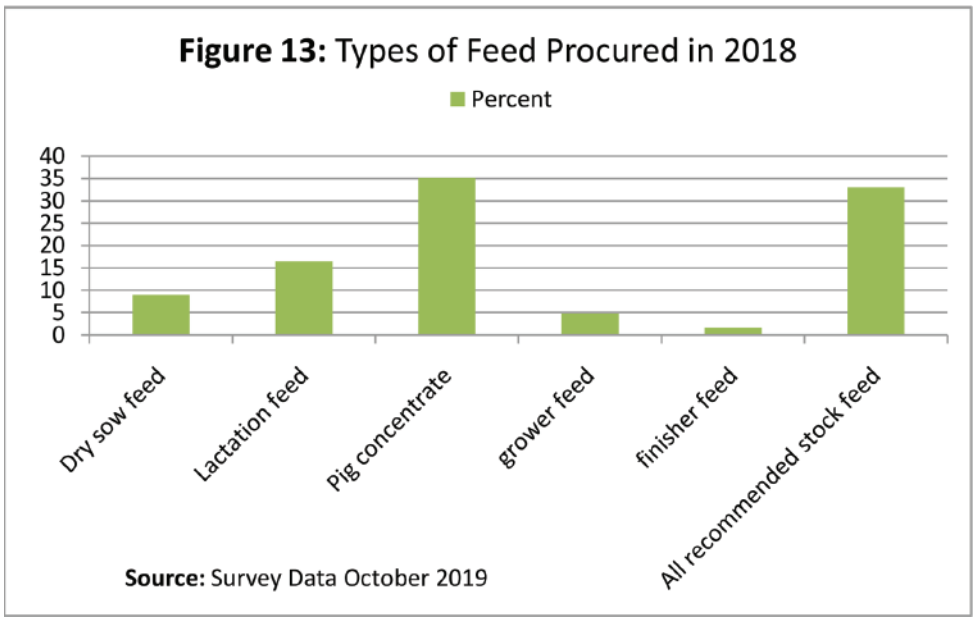
DWFC represents the proportion of food that is converted into meat. The scoping study found that the DWFC rate among the sampled farmers is 7.42kgs against an industry average range of 3.6 to 4.2. The sample average is higher than the standard set by the industry. This is because the animal's growth rate is low which can be attributed to bad management practices and the poor genetics of the pigs.

3.2.2.6 Pig Feeding System and Practices

Feeding systems for pigs involve feed type and form, as well as how it is supplied to the pigs. There are four basic methods of supplying nutrients to pigs: 1) purchased complete feed; 2) grain combined with a concentrate or supplement; 3) grain blended with an amino acid source(s) and base mix; or 4) grain, an amino acid source(s), salt, calcium and phosphorus source(s) and vitamin and trace mineral premixes[5].

The pork value chain scoping study found that the pig farmers use a number of feeding systems. These practices range from providing commercial feed to free-ranging. The largest (62.5%) number of the farmers' feeding practices is a combination of commercial and non-commercial feeds. The logic behind this practice is to try and minimize the cost of feed. Farmers are mixing pig concentrate with spoiled maize crushes and other additives. The farmers who are practicing commercial feeding constituted thirty-one (31%) percent of the sampled farmers. This group of farmers offer opportunity for kick-starting the commercialization process. The non-commercial feeding practice is being done by six (6.2%) of the farmers whilst one (0.5%) percent of the farmers are engaged in free-ranging.

In terms of the feeds purchased by pig farmers in 2018 (see Figure 13), the survey found that Pig Concentrate was the most (35.1%) purchased. This finding bolsters the finding mentioned above that the farmers are practicing a mixed feeding practice. The fact that thirty-three (33%) of the farmers are buying "all recommended stock feed" offers a window for commercialization of piggery enterprises.



The study noted a seasonality challenge in accessing feed and water. The scoping study data indicates that fifty-five (55.2%) percent of the farmers are experiencing feed shortages in summer and nine (9.3%) percent in winter. A high frequency of farmers (55.2%) is experiencing feed shortages in summer because this is the time when the feeds will be running low. This is the season when maize and soya meal, the key ingredients in pig

[5] http://porkgateway.org/resource/feeding-systems-for-swine/ (visited 23rd of October 2019 0300 hours)

feed will be in short supply. Interesting the study data indicates that twenty-nine (29.4%) percent of sampled farmers did not experience any food challenges. The farmers in this category are those who have passed the commercialization gate competencies. The VALUE project should build upon this category of farmers. Then there was a group of farmers (6.1%) who are experiencing feed challenges throughout the year. The FGD sessions noted that this group of farmers are those whose financial background is weak.In terms of the seasonal availability of water for the piggery enterprises, the study data showed that fifty-six (55.7%) percent of the farmers did not experience water shortage throughout the year. This is because these farmers have water sources at their production sites. The water sources include protected deep wells and boreholes. The most used feeding practices among the sampled farmers are the use of feeding bin and feeding troughs found inside the pigsties. The practice of delivering feed via a liquid feed application system and computerized feeding practice are not found among the small-scale and medium scale producers in Zimbabwe.

3.2.2.7 Pig Treatment Practices

The medicines used in the pig industry can be grouped into eight broad areas. These categories are antibiotics and antibacterial substances, minerals, for example iron, vitamins and electrolytes, sedatives and analgesics (painkillers), parasecticides to treat mange, lice and worms, vaccines and sera (and miscellaneous medicines), hormones, growth promoters and probiotics and colostrum supplements. The scoping study explored whether the farmers treated and vaccinated their pigs.

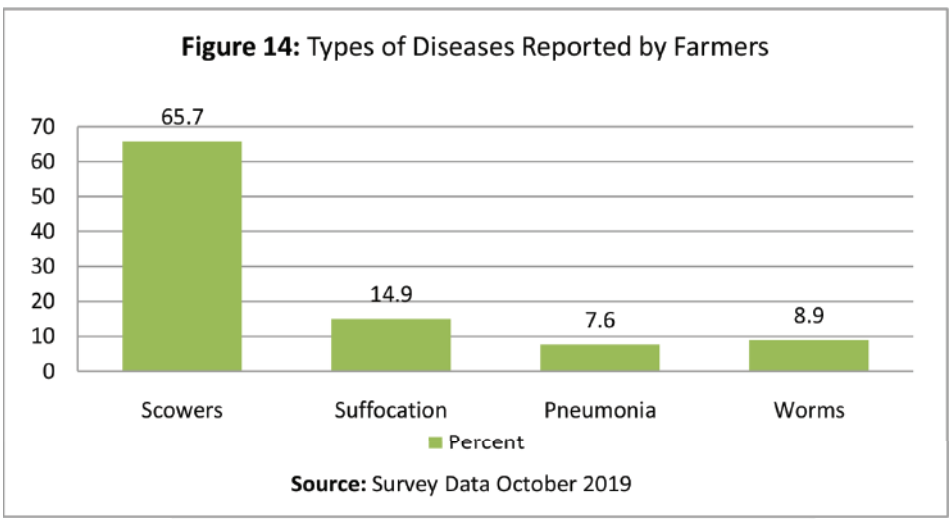
With respect to treatment, ninety-three (92.8%) percent of the respondents confirmed that they treated their pigs if they fell sick. Of the farmers that are treating their animals, seventy-four (74.1%) are self-administering the treatments, while twelve (11.9%) percent and nine (8.6%) percent are being assisted by government personnel and the private veterinary service providers respectively. The low treatment support from the government service providers is because of the incapacitation of relevant departments.

The majority (87.6%) of the sampled farmers reported vaccinating their pigs. The vaccinations are being administered by the famers (83.6%) themselves, government services providers (7.6%) and the private veterinary practitioners (5.3%). 35% mentioned that they use farrow sure, twenty-five (25%) percent are using all the forms of vaccines and the twenty-three (23%) percent are using litter guard. The last seventeen (17%) are using iron.

3.2.2.8 Diseases

Pigs are prone to several diseases. The most common diseases are scours, which account as indicated by sixty-six (65.7%) percent of the respondents. This is followed by suffocation which accounted for fifteen (14.9%) percent of the diseases that the farmers are encountering. The last two diseases are pneumonia (7.6%) and worms (8.9%)

Figure 14: Types of Diseases Reported by Farmers



Source: Survey Data October 2019

3.2.2.9 Pig Production Function Conclusions

Production and productivity and pig off-take from the smallholder sector is low. This was attributed to knowledge gaps experienced by smallholder farmers with respect to information on the markets (input, output, business development services and financial service markets), weak husbandry practices, poor and tired pig genetics and exposure to diseases in general and outbreaks (e.g. African Swine Fever in Nyanga and Mount Darwin areas). The high cost of feed, which constitute eighty (80%) of the production costs makes it very difficult for the pig farmers to operate viably. The pig farmers' management practices are marred by none keeping of records. This negatively affect their ability to financial products and services as they there will not be on production track record.

3.2.3 Slaughtering and Processing Function

It is a legal requirement that all pigs should be slaughtered in an abattoir according to Pig Industry Act (Chapter 18:16). The study found that there are 124 registered slaughtering facilities in Zimbabwe. However, the abattoirs are not strategically located to enable smooth flow of the pork market. In the Mashonaland West province corridor, the nearest slaughter facilities for farmers in Chegutu and Mhondoro-Ngezi are in Kadoma at Koala and Tauya Abattoirs. The registered slaughter facility for pig farmers in Zvimba district is Reinham which is in Harare. In Chegutu town, there are no registered slaughterhouses for pigs. In response to challenges in accessing slaughter and processing facilities, the farmers in Chegutu, through their syndicate have negotiated for a piece of land at Selous (Half-Way) from Chegutu Rural District Council. The Council has given them the land. The proposed abattoir will serve farmers in Chegutu, Mhondoro-Ngezi and Zvimba districts.

In Mashonaland East province, the registered slaughter (Koala, Tilisa and Ziyadhuma) are concentrated in the eastern side of Goromonzi district. This presents logistical challenges for farmers from other parts of the district who require slaughtering services. PIB is more centrally located and would easily service even farmers in Murehwa who do not have easy access to slaughter facilities. However, the slaughter capacity (15 pigs/day) at PIB is below the throughput coming from the farmers.

The consequence of inaccessible slaughter facilities is that the transport costs from farms are pushed up, which reduces farmers' profit margins. As a result, many farmers resort to slaughtering their pigs at farms and taking meat straight to retailers and consumers without inspection. Farmers would be trying to reduce market entry costs by avoiding long distances to the nearest abattoir as well as the charges of slaughtering that are normally high. This puts consumers at risk of contracting diseases.

Abattoirs are registered facilities, operating in accordance with given standards regarding buying and slaughtering livestock from the farmers for prices based on the dressed weight and grade. The study found the registration costs for abattoirs are too high and therefore act as an entry barrier. For example, Export Grade Abattoirs pay USD500, A-Grade abattoirs pay USD400, B-Grade abattoirs pay USD300 and C-Grade abattoirs pay USD200 as annual license fees. This limits the number of participants in the slaughter and processing function.

The study found that there is a sizeable number of pig abattoirs across the different grades. In grade C, there is PIB with a processing capacity of fifteen (15) pigs a day. PIB abattoir processes animals from its production unit and from farmers requiring slaughter and blast freezing services. The abattoir at PIB is failing to meet the demand for both services from farmers. Fortunately, the facility is being upgraded to Grade B. The buildings have been erected. Left is the equipment (e.g. for the cold room).

Grade B abattoirs are those with a capacity to slaughter 16 to 300 animals a day. Available Grade B abattoirs are Tilisa, Ziyadhuma, Reinham and Koala. Tilisa has a capacity of 50 and was operating at 90% at the time of the

study. This high capacity utilization is because it is getting slaughter pigs from Kaola, and Surrey Abattoirs, which are currently concentrating on beef. Ziyadhuma is a state-of-the-art abattoir, with an installed capacity of 80 but was operating at 20% at the time of the study. Koala's capacity is 140. However, at the time of the study it was operating at 50%. Similarly, Reinham with an installed capacity of 150 was at 50% operational capacity. The Grade B Abattoirs are largely offering slaughter, blast freezing, wholesaling and retailing services. There is very limited processing and value addition at Grade B Abattoirs.

Grade A abattoirs are those with installed capacities above 300 pigs a day and are mostly export oriented. In this category there is Colcom with an installed slaughter capacity of 1000. However, it is only operating at twenty-three (23%) capacity. To enhance its utilization of the installed capacity Colcom has set-up pig production on its farms and through outgrower units like Triple C in Norton and others in the Goromonzi, Shamva and Mazowe districts. Grade A Abattoirs are also involved in wholesaling and retailing. They also sell raw and processed pork to wholesalers and retailers. Colcom processes raw pork from mostly its own production units and other producers that meet its requirements for consumers.In addition to the above registered Abattoirs, there are numerous, unregistered and small slaughter facilities. These however provide pork at irregular times for the fresh meat market. Their focus is mostly on the urban low and middle income market.

3.2.4 Wholesaling and Retailing

The wholesaling of pork and related products is done by the Abattoirs and a few independent butcheries. Wholesaling is dominated by meat companies such as Colcom, which is the industry leader. Other Abattoirs are also involved in wholesaling. Colcom specialises in pork products and has the largest pork abattoir in Zimbabwe. It sells raw and processed pork meat to wholesalers, retailers and has outlets where it sells directly to the public.

Besides Colcom and other Abattoirs involved in retailing large chain supermarkets (OK, Pick'n'Pay, Choppies, Spar), small retail-shops, tuck shops in high-density suburbs (see Figure 15), meat vendors, and independent butcheries distribute pork and pork products. Some retailers buy raw pork from farmers and Abattoirs. The large chain supermarkets also sell raw and processed pork (tinned meat, bacon, polony, chops, ribs, sausages etc.) from Colcom to their consumers.

Figure 15: A Tuckshop Selling Pork Meat(Harare)

Source: Kagoro J. September 2019

3.2.5 Consumption (End Market) Function

The study found that there are several pork marketing channels from producers to different end markets. These different marketing channels are elaborated below:

a) Channel One (Farmer-to Farmer's Household).

The circumstances that give rise to this channel vary depending on the farmer. The most common reasons advanced for slaughtering pigs for home consumption is the need to meet household protein needs, when there are important visitors to the household or when an animal is ill. The percentage of pigs consumed under this is very low, under 1%. The slaughtering is done at the farm.

b) Channel Two (Farmer-to-Local Market).

In this channel, farmers supply the local or neighboring market, which often consists of civil servants (teachers, extension personnel, police officers) and other farming households. The price of the pig is negotiated through visual assessment of the animal. The main characteristic that is considered is the animal physique. The slaughtering is done either at the farm or at the premises of the buyer. In this channel the major suppliers of pork are small scale farmers.

c) Channel Three (Farmer-Butcheries-Urban Low- and Middle-Income Market).

In this marketing channel, the farmers supply butcheries that later supply the urban low-to-middle-income urban markets. These markets are mostly supplied with raw pork meat, pork head, trotters and offals. Small scale farmers are the main suppliers of pork to this channel, which is also preferred because there are no slaughter and meat inspection fees involved. This increases the farmer's margins. However, this exposes the consumers to health challenges as they are eating uninspected meat some of which may have been processed under equally uninspected conditions.

d) Channel Four (Farmer-Abattoir-Farmer-Local and Urban Low-Income Markets).

This is where a farmer sends their pigs to the abattoir for slaughtering and blast freezing services. The farmer then collects the raw pork and supplies local butcheries, small retail shops or retails to the urban low-to-middle-income urban markets. The study noted that this is the main marketing channel that is being used by the small-scale pig farmers. This is because the majority of the Abattoirs accessible to the small-scale farmers just offer slaughtering and blast freezing services. They do not have the capacity to provide other services to the farmers.

e) Channel Five (Farmer-Abattoir-Institutional Buyers, Butcheries & Large Chain Supermarkets-Urban Markets).

In this channel, the farmers sell their pigs to Abattoirs, which slaughter, blast freeze and/or process the raw pork meat before wholesaling to institutional buyers (schools), butcheries and large chain supermarkets who will retail to the urban markets both high and low-income ones. In this channel the major actors are the Grade A Abattoirs such as Colcom and Koala. This channel is mainly supplied by medium and large-scale pig producers and a noticeably growing number of small-scale producers.

In this channel, the study also observed that meat vendors, those that own restaurants and the ones involved in providing meals in urban areas are being supplied by the Abattoirs. They then sell the meat as raw to the urban low income and middle-income earners or as cooked meat.

The study found the following end markets in the pig industry for farmers in the VALUE districts;

a) Farmers' Household Market.

This end market is very limited and functions intermittently depending on the circumstances of a farmer.

b) Local Market.

The local market is relatively vibrant during weekends and festive seasons. These are the times when the end consumers will be partying and braaing. Other than these festive seasons this market is very low.

c) Urban Low and Middle-Income Markets.

This market is being supplied by independent butcheries, large chain supermarkets, farmers and vendors. It is largely supplied with raw pork (including pork heads, trotters and pork skins). Products supplied to this market offer low margins to farmers. However, this market has great potential for processed and high value pork products. This is possible if these products are packaged appropriately to meet the disposable income levels of the consumers in this market.

d) Urban High-Income Market.

This market provides the highest margins for the pork value chain actors. It requires processed pork products such as polony and beacon. This niche market is the one that the VALUE project chain actors can also target.

3.2.7 Regulatory Environment

The study found out that there are regulations that affect the pork industry. These relate to production at enterprise (farm) level, livestock inputs, environmental management and the whole pork value chain. The farm level is governed by the Animal Health (movement of cattle & pigs) Regulations of 1984. As a disease control measure, the Department of Veterinary Services requires that animals get a movement permit for them to be moved from their usual place of stay to either an abattoir or another farm. This is done as a way of certifying that the source of animals is free from all notifiable diseases and as such, they are not a health risk wherever they will be taken to. The farmers are required to pay USD0.70 per pig for the animal movement permit. Many of the small-scale farmers are avoiding paying this levy which increases transport costs hence they resort to slaughter at the farm or selling to the local market.

Farmers are also expected to comply with the EMA Act (Effluent discharge management –inspection fees and fines). However, EMA is not always on the ground and the farmers get away with it. The Rural District Councils Act and SI 129 (levies of RDCs) compel farmers to pay levies to the RDCs. The annual development levy is at USD0.13 for communal, USD1 for A1 farmers and A2 farmers are levied USD0.30/hectare per year. Additional environmental management regulations include the following:

- Environment Management (Effluent & Solid Waste Disposal) Regulations of 2007;
- Environmental Impact Assessment & Ecosystem Ecosystems Protection Regulations; Air Pollution Control Regulations (ammonium & methane);
- Environmental Management (Hazardous Substance, Pesticides & other toxic Substances) Regulations

The study observed that regulations are not fully enforced for small-scale pig producers. This is because EMA lacks the capacity (mobility and personnel numbers). The bio-security regulation is barely observed by the small-scale farmers. Overall, there is low compliance with regulations.

At input level, the pig industry is regulated by the Customs & Excise (Tariff) Notice Amendment Number 20, the Fertilizers, Farm Feeds & Remedies Act (Chapter 18:12), the Medicines and Allied Substances Control Act (Chapter 15:03) and SI 145. The Customs and Excise Act is making the veterinary supplies and feeds expensive for the farmers through the import taxes and value added taxes levied on pig industry raw materials. SI45 has made maize a controlled product such that the pig farmers cannot even buy maize from anywhere else other than from GMB, where it is sold above the millers pegged price. The SI and removal of subsides on grain has increased the cost of by feed by an estimated 20%.

With regard to Customs & Excise (Tariff) Notice Amendment Number 20, a 5% tax 15% VAT is charged on the importation of soya meal and 15% duty on imported raw materials for processed pork. This makes accessibility and availability of the important raw materials very difficult. On the other hand, pork substitutes are allowed in the country without import duties rendering the pork industry unviable.

The lack of enforcement of Fertilizers, Farm Feeds & Remedies Act (Chapter 18:12) has contributed to the mushrooming of informal stock feeds. The quality of the feeds is not fully known and is affecting productivity at farm level. The restrictive and cumbersome protocols of the Medicines Control Authority of Zimbabwe (MCAZ) are also negatively contributing to the shortage of veterinary drugs and vaccines. To register a drug, one is expected to pay USD100 while an ad valorem tax of 0.5% is charged on importation of drugs.

The pork value chain is further governed by these other regulations;

- Africa Swine Fever Regulations of 1994
- Pig Industry Act (18:15) of 1984;
- Pig Industry (Grading Regulations) of 1997;
- Pig Industry (Carcass Classification & Grading) Amendments Grading Regulations of 2002
- Pig Industry (levy & returns) Regulations of 2008

The compliance costs of the regulations eat into the margins of the pork value chain actors.

3.2.8 Value Chain Financing

Value Chain Finance (VCF) refers to financial products and services that flow to or through any point in a value chain to enable investments that increase actors' returns, support growth and competitiveness of a chain. A VCF is distinguished from other financial products and services by its design, which targets injection of finance at specific points in a value chain to increase the competitiveness of the entire value chain. VCF involves multiple actors and leverages on relationships to lower or mitigate risk.

The scoping study carried out a VCF assessment across the different nodes of the value chain. The study results indicate that all the actors across the chain are self-financing. With respect to pig producers, the scoping study results indicate that (92.6% of the production is self-financed, 3.4% is financed through bank loans and 4% is funded through remittances.

Whilst the value chain actors require financial products and services, the current products are not tailored to the pig production cycle. Most producers do not have collateral (especially small-scale farmers) required by banks. Other requirements by the banks include, business performance track record and the farmers' banking history. The major financial requirements by the value chain actors are for capitalization of their enterprises and working capital. The small-scale farmers do not keep most of the essential production records and are also not integrated into the formal banking system. This, therefore, becomes an entry barrier for the farmers to access loans and other financial services. Of the seven (7.4%) percent of the farmers that acquired loans did so from Internal Savings and Lending schemes (ISALs) and Micro-Finance Institutions (MFIs).

Financial Institutions showed willingness to do business with pork value chain actors. However, they perceive agricultural investment as high risk business. They cited price, climate and credit risks. There is therefore a need for innovative agricultural financing solutions that allow recruitment of the unbanked, build smallholder commercial viability and manage or reduce risks to financiers.

3.2.9 Value Chain Governance

Value chain governance refers to the relationships among the buyers, sellers, service providers and regulatory institutions that operate within or influence the range of activities required to bring a product or service from inception to its end use (https://www.marketlinks.org). Governance is about power and the ability to exert control along the chain - at any point in the chain. Some firms (organizations or institutions) set while others enforce parameters under which others in the chain operate.

The study found the pork value chain in Zimbabwe is captive. This is seen in that smallholders are dependent on a few buyers that wield a great deal of power and control. In the context of the Zimbabwean pork value chain, there are several small-scale producers who depend on the industry leaders and other Grade B Abattoirs. Big buyers set prices and standards in a way that reinforces their monopoly. This captive pork value chain governance is characterised by arm's length "spot market transactions" between producers and buyers without contractual arrangements.

The captive governance structure accounts for information asymmetry. The capacity of producers to efficiently and reliably produce the product and the business enabling environment is limited. The study found producers do not have access to adequate or reliable information on the latest industry cost-saving technologies and pricing dynamics. As such, their production capacities are low. The regulatory environment is not enabling for the small to medium-scale producers as the cost of compliance is high. Lastly, small producers are not organized to be able to influence the governance of the pork value chain.

The value chain governance structure must be changed to market governance. In market governance, transactions are relatively simple, information on product specifications is easily transmitted, and producers can make products with minimal input from buyers. This can only be achieved if farmers organize themselves into viable business organizations and adopt technology-based methods that reduce unit costs of production.

With respect to farmer organization, the study found that pork farmers are poorly organized, especially the small-scale producers. The medium to large-scale farmers are more organized with most belonging to PPAZ. 92% of sampled farmers do not belong to any farmer groupings or organizations. Weak participation of farmers was attributed to the weak capacity of membership organizations to mobilize and organize farmers. This results in farmers failing to benefit from economies of scale in accessing inputs, extension and marketing opportunities.

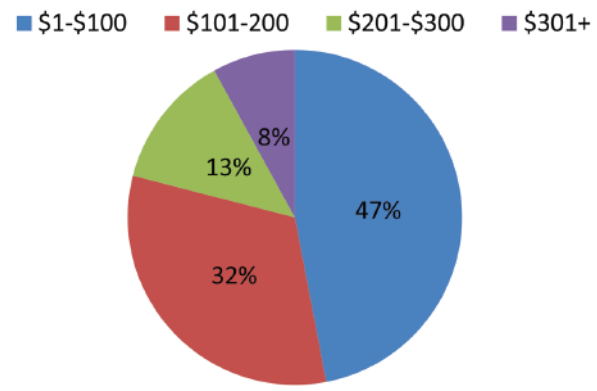
3.2.10 Fair Value Farming Branding

A new business strategy is emerging in the agricultural and food sectors known as "Creating Shared Value" or "Fair Value Farming Brand." Fair Value Farming Brand arrangements transform the traditional competitive seller/buyer relationships to a collaborative approach. Transparency, working together, and providing fair returns to all partners under shared environmental or social values are the new hallmarks of food value chains (https://www.ams.usda.gov/services/local-regional/food-value-chain). This business arrangement appeals to a growing number of consumers who want to know the story behind their food and want to support businesses with a social consciousness. Responding to the needs of these customers through strategic collaboration creates greater efficiency and profitability among food producers and distributors. It also translates to customer satisfaction.

In assessing the 'fair value farming brand' the study focused on five interwoven issues. These were worker salaries, return on investments (profits) to entrepreneurs, tax revenues to government, better food supply to consumers and net impact on the environment (externalities). The net impact on the environment can be positive or negative. With respect to the salaries, the study focused on the production function. The majority (68%) of the employees are paid in cash or kind and they do not have employment contracts.

The practices of paying workers in cash and kind and absence of employment contracts is against the principles of fair share branding in value chain development. The study found that 47% (Figure 16) of pork industry employees at the product function level earns below ZWL195.00 (USD13/month) as per the NEC General Agriculture agreement effective from the 1st of July 2019. Only 23% percent of the employees in the production function are paid above the statutory minimum wage of USD13/month. With regard to the return to investment, the study noted that there is no fair sharing of the value created in the chain.

Figure 16: Cash Payments to the Employees in the Pork VC at Production Level

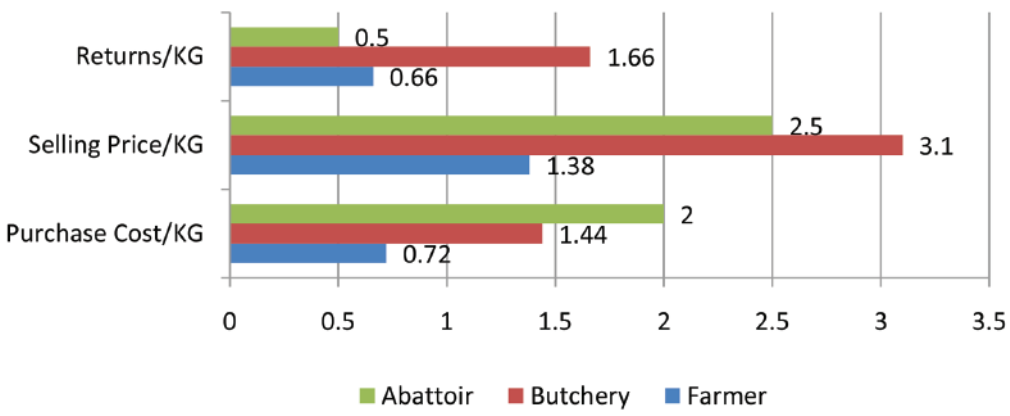


Source: Survey Data October 2019

The study explored the returns on investment for the main chain actors (farmers, butcheries and abattoirs). Data indicates that butcheries and brokers are getting the highest returns at USD1.66, abattoirs get the least at USD0.50 and farmers are in-between at USD0.66 return per dollar invested. This confirms what the farmers mentioned in FGD sessions as they complained that butcheries and brokers are unfairly benefiting from their production.

To fairly share value, VCD theories note that as the chain develops actors should start paying government taxes and levies. However, the study found out that the level of tax and levy payment by the pork value chain actors is still very low. Data indicates that 67% of study respondents confirmed they are not paying any taxes and levies to public institutions.

Figure 17: Return to Investment Per Dollar



Source: Survey Data October 2019

The low tax and levy payments is because of the high costs of compliance and poor compliance monitoring. The fair value sharing concept in the pork sub-sector is also compromised by the negative externalities generated along the value chain. Pig production pollutes air and water with toxic waste particles. Waste from pigs carries pathogens, bacteria (often antibiotic resistant), and heavy metals that can be toxic when ingested. Pig waste also contributes to ground water pollution in the form of groundwater seepage and waste spray. The contents in the spray and waste drift have been shown to cause mucosal irritation, respiratory ailments, increased stress, decreased quality of life, and higher blood pressure (http://porkgateway.org/resource/feeding-systems-for-swine/). Most farmers were found not to properly dispose the pig waste. EMA is also not properly monitoring the disposal of the waste. Improper waste disposal by farmers presents an environmental justice problem. Affected communities are not receiving benefits from the negative externalities from pig production.

3.2.11 Support Services Function

The study investigated the secondary chain of the pork value chain. This covered the identification of the different support service providers, their roles and capacity challenges per function node. The results of this interrogation are presented below.

3.2.11.1 Input Supply and Production Function Service Provider

The main service providers at the input supply and production service providers are PIB, DVS, AGRITEX, Pig Producers Association of Zimbabwe (PPAZ), Department of Small to Medium Enterprises (SMEs) of the Ministry of Women's Affairs, Community, Small and Medium Enterprise Development and the Environmental Management Agency (EMA).

The PIB is involved in farmer trainings, research on pig feeds and diseases, advising farmers on marketing pork/ pork products, supplying breeding stock and semen to farmers. The other services provided by PIB include proposal write ups, a slaughter facility, performance monitoring at individual farms and village farm visits. PIB also maintains a data base for farmers in the country. Currently the database has 1222 farmers 25% to 30% of whom are women and youths. The database has 13 large scale farmers and at least 1160 (94.9%) are small-scale farmers. PIB services are also available through its extension staff and PIB website, emails and WhatsApp. In Matabeleland, PIB has two officers. Additionally, PIB has an Abattoir with a slaughter capacity of 15 pigs a day through which it offers slaughter facilities to farmers around it. The PIB Abattoir is being upgraded to a Grade B facility to be able to meet the demand from farmers.

The PIB is constrained by staff challenges. The farmer-to-extension staff ratio is 1:306. This ratio indicates that the current staff is far fewer compared to the number of farmers. Shortage of training equipment and vehicles is negatively affecting the delivery of PIB services. The current limited budget support from Government is constraining the implementation of new innovative programmes such as the weaner programme and other services. Government extension staff noted the need for refresher courses to keep them abreast with technological developments in the industry.

The mission of AGRITEX is to provide technical and advisory services to the agricultural sector for purposes of enhancing production and productivity. The core functions include livestock extension and advisory services, farmer training, livestock multiplication and regulatory services. AGRITEX lacks adequate capacity in terms of the numbers of extension personnel, mobility and the latest knowledge on pig industry developments. The scoping study found that during the merging of AGRITEX and DLPD, some extension staff with no basic knowledge on livestock promotion and development were assigned to support farmer development compromising the quality of available support.

The Department of Veterinary Services (DVS) mission is to promote bio-security, animal health and welfare for the benefit of the livestock industry and human well-being. Its core functions include animal disease surveillance, animal disease investigation, disease or veterinary control, overseeing veterinary infrastructure, providing animal health information and extension within the context of the Animal Health Act. The strategies used by DVS to realise its mandate include:

1. Scanning the environment to maintain an effective disease surveillance system for the early detection and management of animal diseases in both livestock and wildlife;
2. Implementing risk management measures for prescribed animal diseases and pests of economic and zoonotic importance (Anthrax, rabies, FMD, Newcastle, Tick-borne diseases, and tsetse flies);
3. Enhancing animal health, production and welfare through communication and providing veterinary extension services with special emphasis to the emergent and smallholder farmers; and
4. Building and maintaining physical veterinary infrastructure (dips, animal handling facilities), human resource capacity and capability for the sustainable delivery of services and regional co-operation in animal health.

The DVS manages 142 Animal Health Centres in the country. These centres are not being fully utilised and risk being white elephants. DVS lacks capacity with regard to personnel, mobility and knowledge competencies. It does not have adequate extension staff to cover all the farmers in the districts. The department's ability to deliver on its mandate is constrained by not having enough vehicles and motorcycles. For instance, in Chegutu district, the department has one old vehicle and two motorcycles. Ideally the DVS in Chegutu should be having twenty-four (24) motorcycles, one for each extension officer. DVS personnel also noted the need to have their skills and competencies upgraded in line with the latest developments in the industry across the globe.

Veterinary Suppliers and Feed Manufacturers provide support services at the production level within the PVC. Most of these service providers facilitate farmer learning on how to use their products. Feed manufacturing companies are even organizing trainings for the farmers on how to feed their animals. At conferences organized by PPAZ feed manufacturers are given space to showcase and demonstrate how their feeds can be used in pig production.

Veterinary Suppliers and Feed Manufacturers (National Foods, Agrifoods, Feedmix, Profeeds, Capital Foods, Country Feeds, Windmill, Norvatec) are failing to meet farmer demand for their services. This is partly because of the regulatory environment which is not conducive. The cost of importation is very high because of the import duty policy (5% & 15% VAT on soya meal; and the 15% duty on imported raw materials for processed pork; allowing importation of pork substitutes). Statutory Instrument (SI) 145 is also negatively affecting feed manufacturers on access to maize in required quantities.

The Ministry of Women's Affairs, Community, Small and Medium Enterprises Development, through its SMEs department is mandated with the training of the small-scale farmers into entrepreneurs. The department provides training, business advisory services, promotes linkages between big business and SMES and linkages to financial services markets. The department also lobbies for working spaces from the local authorities. The SMEs department is however constrained by lack of resources (financial and human) to execute its mandate.

Another service provide in the pork value chain in Zimbabwe is the Pig Producers Association of Zimbabwe (PPAZ). Whilst PPAZ is a service provider across the whole value chain, its presence is more on the input supply and production function. The association was formed in 2006. Its formation was driven by challenges faced by pig producers, for instance maize shortages. Therefore, PPAZ was intended to amalgamate the importation of more maize for feed and to lobby the government. On the other hand, PPAZ was meant bring a level playing field in an industry dominated by Colcom which drives the market due to its size. However, Colcom also joined the association. Therefore, the dominance of Colcom has not been neutralized as it still controls 60% of the market.

The PPAZ seeks to serve the interests of pig producers, both large and small. Information on pig production, profitability and sustainability is shared between members so that the industry remains vibrant and viable. The vision of the Association is to be a broad-based national body that respects and values the benefits of enhanced pig production and marketing and to support all Zimbabwean pig producers' in their efforts for profitability and sustainability.

The PPAZ has been organizing learning events for its members and the general public annually. In 2018, the PPAZ, organized a Pig Symposium in partnership with the Stockfeed Manufacturers Association. It brought together current and prospective pig farmers as well as service providers to the pig industry to share ideas on improving the competitiveness of pig production. The theme was: "Improving Efficiencies in Pig Production." Another symposium was organized in2019 focusing on the value chain development approach for the pig industry.

The main challenge for PPAZ is limited members. According to the PPAZ current Chairperson (Mr. G. Mudanga) the current members of PPAZ is 15 are mostly medium and large-scale producers. Compared to more than 1000 on the PIB database there is need for a membership mobilization drive for the association to enjoy the economies of scale when lobbying around and influencing policy.

EMA promotes sustainable management of natural resources and the protection of the environment with stakeholder participation. With regard to pig production EMA is concerned with the management of effluent and disposal of solid waste by the industry. The agency oversees compliance to relevant statues by farmers. It is supposed to make sure that the construction of pig housing adheres to the regulations including the siting of waste disposal facilities. However, due to financial and human constraints, EMA is not able to carry out its function to the full. Farmers cite high costs of compliance for non-implementation of relevant measures to protect the environment. Essentially, relevant regulations are not being fully followed with consequences for the industry's footprint.

3.2.11.2 Slaughtering and Processing Function Service Providers

The support service providers for animal slaughter and meat processing function are local authorities, Ministry of Health and Child Care, the Zimbabwe Republic Police, AGRITEX, Livestock and Meat Advisory Council and Environmental Management Agency (EMA). The local authorities' role in the pork value chain's slaughter and meat processing stage is the allocation of land and registration of Abattoirs. Through the "Ease of Doing Business" agenda for the local government sector supported by national government and the United Nations Development Programme, the application of premises for setting up butcheries and abattoirs is done in less than a week. Local authorities also levy butcheries and the Abattoirs. The local authorities are constrained by mobility to collect the levies and taxes. On the other hand, the local authorities do not have transparent methods of investing the levies from the pork value chain actors for the development of the pig industry triggering resistance by sector ratepayers.

The ZRP's role is ensuring that animals that are being moved have not been stolen. They do this in liaison with DVS who issue animal movement permits. The process of getting the permits is however cumbersome and in most of the cases the farmers are forced to pay extra money to transport police officers and for their meals. While this ensures that the issuance of movement permits is faster (i.e. than would have been without "these incentives") it presents risks in terms of the provision of corruption-free public services meant to protect the public.

The Ministry of Health and Child Care is responsible for the inspection of the slaughter and abattoir facilities to ensure that they meet minimum health standards. The Ministry lacks capacity in terms of mobility to inspect relevant facilities regularly and without being facilitated. AGRITEX on the other hand provides meat inspection services at the slaughter and abattoir facilities. A Meat Grade and Inspector is stationed at each abattoir. The study was informed of corruption as some unworthy meat gets passed as fit for human consumption. Clearly

therefore the inadequate capacity characterising state institutions that offer strategic services to the sub-sector and thus the value chain is a clear drag on its development.

EMA is supposed to monitor and regulate the disposal of affluent and waste at the abattoirs, but because of resource constraints, this function is usually performed at the bigger slaughter facilities.

Livestock and Meat Advisory Council (LMAC) protects, promotes and furthers the interests of those engaged in the livestock and meat industry to ensure the economic viability of the sector. LMAC is active across the pork value chain. Critical areas include policy and regulations making the agency an entry point for advocacy, lobbying and influencing. Its key functions include the following;

- Establishment of consumer meat and dairy consumption patterns and markets in Zimbabwe;
- Recommendation of strategies and instruments to reduce and mitigate livestock and meat product insecurity at national and household levels;
- Collection of livestock and meat industry statistics and returns;
- Coordination and establishment of standards criteria and draw up quality assurance schemes for livestock, dairy and meat products for the various Associations and
- Regulatory review.

3.2.11.3 Wholesaling and Retailing Function

At the wholesaling and retail function, the service providers are the Consumer Council of Zimbabwe, LMAC, ZRP, Ministry responsible for health and the local authorities. The key function of the service providers is to ensure that the public gets safe meat fit for human consumption. The service providers are involved in the inspection of the quality of the meat that get to the consumers as well as the premises at which meat and meat products are sold. Councils license facilities and their health staff (working in collaboration with those of the national Ministry responsible for health) do the inspections closing facilities considered to be non-compliant.

3.2.11.4 Regulatory Environment Function

The regulatory environment provides support services concerned with the creation, maintenance and ongoing improvement of an enabling business environment for the pork industry. The main service provider is the Ministry of Lands, Agriculture, Water and Rural Resettlement (and its departments like AGRITEX, DVS as well as parastatals like PIB, GMB, AMA and institutions like the LMAC etc.). Other government agencies outside the Ministry responsible for agriculture include health, environment, local governance, finance, labour and social development. Key sector Ministries therefore have direct and indirect roles to play in subsector regulation. However, their input is largely coordinated through the lead Ministry (of agriculture).

PPAZ leads on lobbying, advocacy and policy influencing for the creation of a viable pig industry that is globally competitive. AMA is a parastatal under the Ministry of Lands, Agriculture, Water and Rural Resettlement. It (AMA) regulates the production, buying and processing of agricultural products and facilitation of market linkages for the scale-scale farmers in the country. The Ministry of Lands, Agriculture, Water and Rural Resettlement is responsible for the development of a National Livestock Policy. The policy's intentions are to facilitate efficient and effective utilisation of the animals that the farmers have. The Ministry is also tasked with policy enforcement and disease surveillance and control

3.2.12 Conclusion

Study findings show that the pork value chain in Zimbabwe has potential. The VALUE program districts are also critical hosts of the sub-sector. It is however clear that the smallholder farming component of the sub-sector faces numerous challenges that need addressing as a pre-condition for full and viable participation in the sector. The value chain has the potential for commercialization given the unmet market demand. This remains the case

even with the fall in disposable income for most Zimbabweans. The demand for pork meat and related products is still high in the urban low to middle and the high-income markets.

The inputs supply function is constrained by the non-availability of veterinary drugs and vaccines. Available drugs and vaccines are expensive beyond the reach of the majority of small-scale producers and the packaging is not in tandem with the herd size of both the small and medium scale pig farmers. Feeds constitute 80% of the production costs and is not easily accessible. Value Chain Financing is weak across the whole pork value chain. Transport costs to get inputs to farms and animals to the market are very high. This pushes the production costs and negatively affecting the margins of the chain actors. The equipment used in the pork industry are mostly imported and therefore subsequently expensive.

The farming of pigs in Zimbabwe is mostly done by small and medium scale farmers whose production is constrained by use of "tired" genetics. This is attributed to the absence of pig breeders in the country. The production and productivity indicators are low because of poor smallholder management practices. However, some practices by the farmers offer a launchpad for the commercialization of the pig industry by small and medium scale farmers. Pig production and productivity are also inhibited by a regulatory environment which is not enabling and captive value chain governance. The cost of compliance with the regulatory environment is very high.

The pork value chain in Zimbabwe is well served by different service providers. However, capacity constraints are negatively affecting service provision to the chain actors. The public service providers are the most incapacitated due to limited treasury support.

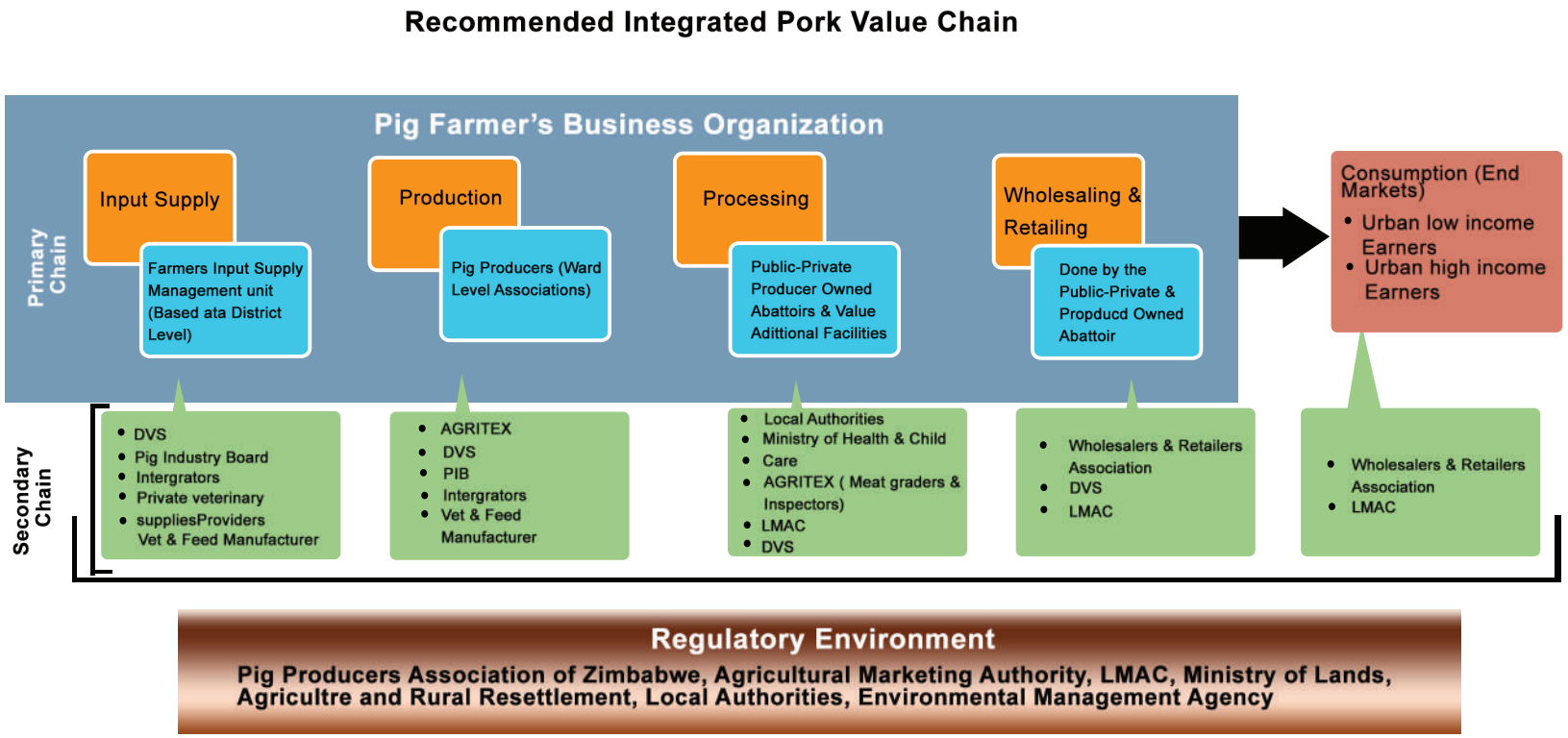
4.0 RECOMMENDATIONS

To fully exploit the commercialization potential in the pig industry this scoping study makes the following recommendations;

4.1 Enhancing Farmer Organization for Vertical Value

Currently the small and medium scale pig producers are not fully organized into functional business entities that would exploit the potential in the industry. The study recommends the setting up of Farmer Business Organizations (FBO) along each of the key production corridors. The FBOs will facilitate efficient agro-service and extension delivery, technology adaptation and mechanisation in of the pork industry, input procurement at favourable prices and competitiveness in output markets. Figure 14 provides an overview of the proposed vertical integration through the FBOs.

Figure 18: Detailed location and function of Farmer Business Organizations in the PVC



Source: DEGI 2019

These FBOs will be owned by pig producers and will have business units that run the pig business on behalf of farmers. They will enable producers to be vertically integrated in the pork value chain. The functions to be vertically integrated include input supply, slaughtering, processing, wholesaling and retailing. The vertical integration means that through the FBOs farmers will now be carrying out some of the value chain functions they never used to be involved in. However, this must be strategically phased in, with the FBOs taking responsibility of key functions through structured capacity building.

The business units of the FBOs will be responsible for the provision of inputs through aggregation centres established at the DVS Animal Health Centres. The business units will also be responsible for the local feed production. This function can be sub-contracted to youths and young women. The study further recommends that selected Animal Health Centres that will host the input aggregation centres be solar powered to enable storage of drugs and vaccines under refrigeration. The centres that will be set up will also take care of the aggregation of the animals meant for slaughter. This will reduce the unit cost of transporting animals.

The Value Chain Integrator will a play leading role in assisting FBOs in setting up the input supply aggregation centres. The study recommends the setting of Producer-Private-Public Partnerships for establishing FBOs owned slaughtering and abattoir facilities in the medium term. The facilities set-up under this mechanism will enhance competitiveness of small and medium scale farmers in the country. This approach is also in sync with the national development policy, the Transitional Stabilization Plan (TSP). Facilities will buy animals from farmers (the payment mechanism will have to be agreed upon), slaughter, process and sell products. The proposed joint slaughter and abattoir facilities should rely on green energy sources so that they cope with the power outages in the country.

The study further recommends the establishment of one slaughter and abattoir facility in the Mashonaland West corridor to cater for the farmers in Chegutu, Mhondoro-Ngezi and Zvimba districts. This follows observations that the farmers in these districts face challenges in accessing slaughter and abattoir facilities. The recommended facilities could be established at Selous (Half-way), which is centrally located and the farmers have already secured land from the responsible local authority.

In the Mashonaland East, the study found that more than enough slaughter and abattoir facilities exist. Therefore, the study recommends the upgrading of existing facilities to boost absorption of increased throughput from farmers. The upgraded facilities will be operated under the Producer-Private-Public Partnerships under the leadership of the FBO. Upgrading of PIB facilities that is already underway provides early benefits to VALUE. PIB has started the upgrading process to Grade B abattoir. What is outstanding is to equip the abattoir with cold rooms, blast freezers and green energy. PIB is being recommended because it offers opportunities for the farmers to learn the whole pig production cycle from the farm-to the product. However, the success of this proposal hinges on the negotiations between the FBOs and the willingness of PIB to be in such a venture.

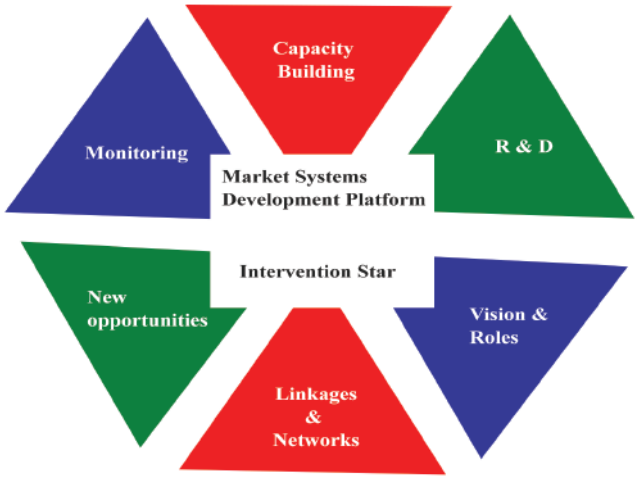
4.2 Market System Development Platforms

The study observed weak vertical and horizontal linkages between the value chain actors. It therefore recommends setting up of Market Systems Development Platforms (MSDP) around the production corridors. Proposed platforms will also deal with the governance constraints observed. The MSDP will be composed of the key value chain actors in both the primary and secondary chains. The size of each MSDP will be a function of the key players along the chain. However, key actors will be farmers, lead firms, processors and buyers (wholesalers and retailers). The leadership of the platforms is recommended to be the lead firms in each of the corridors. In the first year of set-up, the MSDPs are recommended to meet bi-monthly gradually reducing meeting frequency as functionality increase.

The MSDP will be involved in setting the vision of the value chain, i.e. value chain-related corridor goal, efficiency and effectiveness strategies as well how these will be achieved along the value chain. The different roles and responsibilities of each value chain actor will be defined through the MSDP for each value chain. The

proposed functions of the MSDP are shown in the Figure 19 below.The MSDP will also be responsible for research, innovation and development in the corridor. For instance, the MSDP could take the responsibility of research and development of animal feed. Capacity building (coach, mentoring and demonstration) of the value chain actors will be driven by the MSDP. It will also steer networking and development of linkages with key stakeholders for the development of the value chain within the corridor. The exploration of new opportunities for upgrading of value chain functions, will also be taken up by the MSDP.

Figure 19: Market systems Developmet Patform: Intervention Star



Source: Adapted from SDC 2010

The MSDP will also take care of the monitoring, learning and harvesting of lessons for enhancing value chain efficiency and effectiveness. It is important to note that VALUE implementers will not be part of the MSDP. The role of VALUE will be facilitating the functionality of the MSDP and gradual working itself (VALUE) redundant.

4.3 Input Supply Recommendations

Within the FBO model, the study makes the following recommendations regarding input supply function;

i. Establishment of local feed production facilities at the aggregation centres. The feed produced at the aggregation centres will be sold to farmers. The study further recommends farm-based production under centre supervision. This was observed to reduce the feeding costs by 30% and the feed will be fresh which is good for the pigs. The farmer will be knowing what they give their animals. This is important given the mushrooming of unregistered feed manufacturers;

ii. The input aggregation centre will also supply drugs and vaccines to farmers. These will be purchased in bulk and farmers will buy from the centre making them easily accessible. Given that the aggregation centres will be electrified the cold chain will easily be maintained;

iii. It is also recommended that the FBO's have a transport system to ease logistical challenges for value chain actors. The recommended transport system will be run on a commercial basis;

iv. Use of white sorghum as feed production input is being recommended. This is based on PIB insights, which suggest that sorghum contains more energy than maize. If the sorghum is going to be fed at 75-100% of the energy source, it is advisable to increase the protein content of the diet by 1-2% by adding 22.7kg of soya-bean meal per ton of mixed diet. Sorghum will be processed, such that there are no or very few whole kernels for efficient use in pig diets;

v. The study recommends the growing of feed such as maize and barley for animals under hydroponics. This is a system in which green fodder or plants are grown in nutrients rich solutions instead of soil. Hydroponics has the advantage of efficient use of water (2 to 3 litres water to produce 1kg of green forage/fodder when compared to 60-75 litres to conventional system of fodder production) and requires less growing time (requires 1 week (7 days) to get nutritious fodder from seed germination to fully grown plant of 30 cm height. Biomass conversion ratio is as high as 8 to 9 times to traditional fodder grown for 60-75 day). The study recommends that hydroponic fodder production be pilot at the aggregation centres. If sorghum is going to be used as an input, out-grower programmes with farmers in the drier regions of the country need to be developed. This is to ensure its (sorghum) constant supply

vi. With regard to value chain financing, the study observed that the financial institutions are concerned about default risks. Therefore, through the FBOs, the study recommends group lending schemes, which the banks are comfortable with. Secondly the farmers can mobilise or pool their resources and apply for matching project grants.

4.4 Input Supply Recommendations

Under the production function the study recommends;

i. Capacity development of farmers should be framed within the Training for Transformation paradigm. The orientation ought to be a mind-set shift towards fully commercial production. Capacity building will aim to enhance production and productivity by adopting technology-based and cost-efficient methods. It will further focus on collective marketing, finance management and use of digital solutions in agriculture for smallholders to truly benefit from their farms.The capacity development methodologies will include look and learn visits, study circles, demonstration, coaching and mentoring;

ii. To enhance learning and information sharing among the pork value chain actors the study recommends setting up an electronic platform "e-Hochi". This will be a mobile-based platform aimed at increasing access to market and e-extension services. The platform will provide 4-in-1 services i.e. aggregating farmers for input and output markets, financial and extension services. It will only be accessible to members of FBO's with biodata and production records in the system. The e-Hochi platform should also be able to serve other stakeholders through connected services;

- For farmers, e-Hochi will enable access to timely e-extension on husbandry practices, marketing management and financial literacy.
- For financial institutions, it will allow access to bankable and de-risked smallholders to market various financial products, such as insurance as a bundled product with a loan.

iii. Setting up Best Model Pig Farms. The study advises the setting up of best model pig farms, where the other pig farmers can learn best practices. These farms should have training facilities, demonstration sites and breeding facilities for them to act as breeding and finishing development centres. The Integrators and PIB will be best suited for support in establishing the best model pig farms. Other miniature versions at smallholder level and close to aggregation centres will also be a possibility;

iv. Adoption of the best production technologies in the industry for instance automated precision feeder is also a priority. These technologies will increase the efficiency in the use of feed to enhance profit margins. Artificial Insemination (AI) is another technology that has the potential to reduce costs of keeping boars at smallholder farms. The study recommends that it be promoted through PIB and availed through the aggregation centres.

4.5 Production Function Recommendations

End market customer awareness campaigns on the benefits of eating pork meat and products are critical. These will stimulate demand. PPAZ, FBOs, large chain supermarkets and independent butcheries can jointly participate in these with a focus on informing consumers on the hazards of eating uninspected meat.

4.6 End Market Recommendations

The study noted that the policy and regulatory environment for the pig industry is not fully enabling. Costs of compliance eat up the potential profit margins of the value chain actors especially small and medium scale producers. While these are beneficial the smallholders end up foregoing these, which limits penetration of high value markets The study recommends a holistic approach to resolving the policy and regulatory constraints aimed at enhancing the "Ease of Doing Business in the Pig Industry" and "capacitating key institutions that support compliance". VALUE partners can structure this initiative to be driven by the PPAZ and FBOs in partnership with the relevant contact point at the Office of the President and Cabinet, which is responsible for 'ease of doing business' reforms. Relevant public and private sector stakeholders will be invited as appropriate. The Ease of Doing Business in the Pig Industry would focus on the following:

- Animal movement and meat inspection processes with a view to emplace a devolved service provision model;
- Revision of SI 145;
- Revisit of import taxes and duties levied on raw materials used in pig production such as drugs, vaccines, soya meal and maize;
- Research on the potential use of ethno-veterinary practices;
- Enforcement of some of the regulations such as the Fertilizers, Farm Feeds & Remedies Act (Chapter 18:12) and Environment Management (Effluent & Solid Waste Disposal) Regulations of 2007 and
- Business registration process which is currently taking at least 120 days.

4.7 Support Services Recommendation

The support service providers (DVS, AGRITEX and PIB) were noted to have limited capacities. As such, the study recommends capacity building in the following areas;

i. Knowledge and skills competencies. The service providers especially from the public sector need their knowledge to be enhanced. There is need for them to have access to the latest development knowledge in the industry. This can be achieved by providing ICT equipment at district level with internet facilities and supporting staff to go on look and learn visits in other jurisdictions.

ii. Mobility. Most of the extension personnel is not mobile as they lack appropriate vehicles. The study recommends support to increase extension staff mobility based on market-based transport allowances or actual vehicles through a system linked to specific project deliverables.

REFERENCES

1. Biggs, R.; Schlüter, M.; Schoon, M.L. Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems; Cambridge University Press: Cambridge, UK, 2015.

2. Collin R, Bent B. and Bonney L. (2016); A Guide to Value Chain and Development for Overseas Development Assistance Projects.

3. IndexBox (2108) "Africa: Pork (Meat of Swine) - Market Report. Analysis and Forecast To 2025". 13 August

4. IDE (2018); Women's Empowerment in Agriculture: Key Success Factors from Action-Research in Mozambique (Beira Corridor 2016-2018)

5. Jesse, E.V. Measuring Market Performance: Quantifying and Non-Quantifiable. 1978. Available online: http://ageconsearch.umn.edu/bitstream/202897/2/WP-15.pdf (accessed on 22 March 2019).

6. MAL, IAPRI, World Bank, UNZA, et al. 2012. Livestock Sector in Zambia for Economic Growth and Poverty Reduction an Analysis. Ministry of Agriculture and Livestock Report. Lusaka, Zambia: Ministry of Agriculture and Livestock.

7. Ministry of Agriculture, Mechanization and Irrigation Development (MoAMID) (2010). Review and stocktaking report on ongoing development efforts in Zimbabwe and their alignment with CAADP targets and principles CAADP implementation in Zimbabwe. MoAMID, pp. 18-23

8. Pig Industry Board (2010) Challenges in Pig Production in Zimbabwe. Report Presented at the Pig Producers

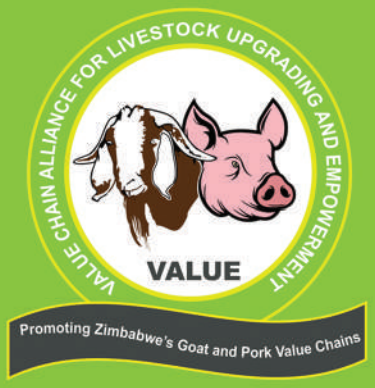
9. Plain, I. (2018) Livestock production and markets. USDA Foreign Agricultural Service

10. Scoones, I. 1992. The Economic Value of Livestock In the Communal Areas of Southern Zimbabwe. Agricultural Systems 39:339-359.

11. Scoones, I. and W. Wolmer. 2001. Crop-livestock integration: Dynamics of intensification in contrasting agro-ecological zones. In Sustaining Livestock in Challenging Dry season environments Strategies for Small scale Livestock Farmers. T. Smith and H.S. Godfrey ed. Proceedings of the Third workshop on Livestock Production Programmes Projects: Ingwe lodge and ICRISAT, Matobo, Zimbabwe September 2000.

12. Shahbandeh, M. (2018) Global pork production in 2018, by country. Statista, www.statista.com

13. Agrisystems (2000) National livestock development study for Zimbabwe. Draft main report, Phase I. Harare, Zimbabwe: Agrisystems Ltd and Pricewaterhouse Coopers.



Tel: +263 772 164 449

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